Treatment Demonstration Report

New York District
Formerly Utilized Sites Remedial Action Program
Maywood Superfund Site

Prepared by:
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for:
US Army Corps of Engineers - Kansas City District
Formerly Utilized Sites Remedial Action Program
Contract No. DACW41-99-D-9001

US Army Corps of Engineers

February 2003, Revision 0

TREATMENT DEMONSTRATION REPORT

FUSRAP MAYWOOD SUPERFUND SITE
MAYWOOD, NEW JERSEY

CONTRACT No. DACW41-99-D-9001
WAD 06 WBS 11

Submitted to:

Department of the Army
U.S. Army Engineer District, Kansas City
Corps of Engineers
700 Federal Building
Kansas City, Missouri 64106

Department of the Army
U.S. Army Engineer District, New York
Corps of Engineers
FUSRAP Project Office
26 Federal Plaza
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Submitted by:

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Issued to: ______________________________ Date: ____________________

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ABBREVIATIONS, ACRONYMS, SYMBOLS, AND UNITS OF MEASURE

ASTM	American Society for Testing and Materials
bgs	Below ground surface
bkg	Background
CDQMP	Chemical Data Quality Management Plan
CERCLA	Comprehensive Environmental, Response, Compensation, and Liability Act
COCs	Chemicals of Concerns
cpm	counts per minute
CQCP	Contractor Quality Control Plan
DOE	Department of Energy
DQCR	Daily Quality Control Report
DQO	Data Quality Objectives
EM	Engineering Manager
FMSS	FUSRAP Maywood Superfund Site
FOL	Field Operations Leader
FUSRAP	Formerly Utilized Sites Remedial Action Program
gpm	gallons per minute
GPS	Global Positioning System
GSS	Gravel Separation System
LLD	Lower Limit of Detection
MHTDP	Materials Handling, Transport and Disposal Plan
MISS	Maywood Interim Storage Site
mrem/y	millirem per year
MS	Matrix Spike
MSD	Matrix Spike Duplicate
MSS	Maywood Superfund Site
NCR	Nonconformance Report
NCP	National Oil and Hazardous Substances Contingency Plan
NGVD	National Geodetic Vertical Datum
NJDEP	New Jersey Department of Environmental Protection
PCB	polychlorinated biphenyl
pCi	picoCurie
PID	Photoionization Detector
PPE	Personal Protection Equipment
PRGs	Preliminary Remediation Goals
QA	Quality Assurance
QC	Quality Control
Ra-226	radium-226

RMA	Radioactive Materials Area
ROC	Radionuclides of Concern
RSO	Radiation Safety Officer
RSS	Radiological Sorting System
SAA	Soil Acquisition Area
SAP	Sampling and Analysis Plan
SC	Sampling Coordinator
SCC	Soil Cleanup Criteria
SOP	Standard Operating Procedure
SOR	Sum- of-the-Ratios
SSERC	Site-Specific Environmental Restoration Contract
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
SVOC	Semivolatile Organic Compound
TCLP	Toxicity Characteristic Leaching Procedure
Th-232	thorium-232
TM	Task Manager
TPWP	Test Pit Work Plan
TS	Task Superintendent
U-238	uranium-238
USACE	U.S. Army Corps of Engineers
USCS	Unified Soil Classification System
USGS	U.S. Geological Survey
USEPA	U.S. Environmental Protection Agency
UTM	Universal Transverse Mercator
VOC	Volatile Organic Compound

EXECUTIVE SUMMARY

A Pilot Demonstration Project was conducted at the Maywood Interim Storage Site (MISS) at Maywood, Lodi, and Rochelle Park, New Jersey to evaluate the applicability of implementing soil volume reduction technologies at the Formerly Utilized Site Remedial Action Program (FUSRAP) Maywood Superfund Site (FMSS). The ultimate goal of the project was to identify means for permanent and significant reduction of the volume of hazardous substances at the FMSS. Previous remedial investigations and characterizations of the FMSS during the 1980s and early 1990s showed that the property soils were contaminated with radioactive material, primarily in the form of thorium-232 (Th-232), radium-226 (Ra-226), and uranium-238 (U-238).

Given the radioactive materials present at the FMSS, a limited number of options were available for reducing the volume of soil disposed of as radiologically contaminated material. The most suitable options were physical separation techniques. By employing a soil processing technology that could separate below radiological criteria soil from above radiological criteria soil, remediation costs might be reduced through a reduction in the volume of soil requiring off-site disposal or less expensive disposal options at alternate disposal facilities.

Two technologies were evaluated during the Pilot Demonstration.

1. Material separation based on grain size
2. Soil sorting based on levels of radiological contamination

Approximately 8,000 tons of representative site soil was processed to quantify applicability of these technologies for use during the full-scale FMSS remedial effort.

The soil processing system was composed of two principal subsystems.

- The Gravel Separation System (GSS)
- The Radiological Sorting System (RSS)

The GSS performed physical size separation, first removing rock and debris with a diameter of 6 inches or more with a passive coarse screen (grizzly), then removing the 3/8 to 6-inch fraction using a set of two graded vibratory screens. A rinse unit that was comprised of a rinse system and associated water recycling system was also used to determine the effectiveness of rinsing the gravel to remove adhered fines from the 3/8 to 6-inch fraction. The less than 3/8-inch size fraction was then conveyed to the RSS for radiological sorting.

With respect to the GSS performance, gravel separation followed by rinsing to remove the associated fines produced a significantly cleaner product with regard to radioactivity. The quantity and size of fines associated with the oversize material limited the use of the rinse unit during the Pilot Demonstration. Engineering modifications are required to use this process during remediation.

The effectiveness of the RSS was inconsistent. When the RSS was presented with material containing radioactivity that was consistently above or below the selected criteria, the system identified the material correctly and successfully diverted it to the proper stockpile. The RSS was less reliable when presented with material containing radioactivity near the selected criteria. This could be explained by the soil mixing that occurs during excavation and transport to the system and through the agitation of the soil as it passes through the various screens of the GSS.

The RSS produced two types of sorting errors.

1. A false rejection error resulted when below-criteria soil was routed to the above-criteria stockpile.
2. A false acceptance error resulted when above-criteria soil was routed to the below-criteria stockpile.

False acceptance was the more common error. A false acceptance rate of 32% by weight was observed, compared with a false rejection rate of 8%. Sorting errors were prevalent at feed concentrations close to the setpoint regardless of the numerical value of the setpoint. Sorting errors were generally more common at lower setpoint values than at higher setpoint values.

RSS volume reduction depends on the selected criteria and the composition of the feed material. Corrected for false acceptance errors, the Pilot Demonstration achieved 33% volume reduction of the material processed by the RSS. Material processed during the Pilot Demonstration was selected beforehand for test purposes.

The prevalence of acceptance errors limits utility of the RSS, since acceptance errors result in radiologically affected soils being mischaracterized as unaffected soils. Modifications to excavation and handling methods were developed with no measurable effect on system performance. Using a setpoint artificially lower than the applicable cleanup criteria may minimize the problem. However, this practice will negatively impact the volume reduction and cost savings achieved by the system.

Material processed through the Pilot Demonstration systems was analyzed to determine if chemical constituents tended to concentrate in any one fraction during processing. It does not appear that the chemicals were concentrated during radiological sorting. There was also no clear, visible trend for a differential distribution of chemical constituents with regard to particle size. Of the material processed during the Pilot Demonstration, none of the average chemical constituent concentrations exceeded any New Jersey direct contact concentration limit for either industrial or residential land use or indicated the soil might constitute a hazardous waste.

The cost benefit of volume reduction technologies on the overall remediation of the FMSS was evaluated. Operational experience gained during the Pilot Demonstration was incorporated into site-specific unit costs for key cost elements of the model. Different remediation scenarios were then evaluated to develop an understanding of the FMSS remediation cost sensitivity to potential program constraints and site-specific conditions.

Key cost factors are the rate and cost of processing, transportation and disposal costs, and backfill credit on soil that can be reused on site. The overall cost of soil processing is primarily a function of volume. There are several aspects of volume that are important: the volume of soil excavated, the volume of excavated soil that can be processed, and the volume of soil recovered as below the remediation criteria.

The GSS and RSS cannot or would not process all types of soil. Material anticipated during full-scale remediation that is not processible due to its physical characteristics by the GSS is the process sediment found on the MISS and Stepan Chemical. The GSS operation most likely would not process organic material from the wetlands; pond material; saturated silts, clays, and sands due to the naturally low coarse fraction. The RSS has similar limitations on the material it can process. In addition, it would not be beneficial to have the RSS process highly contaminated or homogeneously contaminated radiological material that is clearly above criteria.

Two cost analysis alternatives were evaluated. It was assumed that the cost of excavation and disposal of clean construction debris is equal in both cases, so these costs are excluded from the analysis.

1. Base Case: This is defined as the "excavate and disposal" alternative. Under this alternative, standard construction methods are employed to remove radiologically-impacted soil above criteria. The material is brought back to the government property where it is transported and disposed as radiologically-impacted soil.

2. Process Case: The same procedure is followed with respect to excavation. The difference is that the material is run through the GSS/RSS process prior to disposal. An alternative "process case" considered operation of the GSS only.

The unit cost for processing soil is sensitive to the volume of material that is not suitable for processing, the volume of below-criteria soil that is acceptable for onsite reuse, and the construction rate. Unit process costs are minimized when the capital equipment is fully employed. Under-utilization of process capacity exists when there is not a sufficient supply of soil suitable for processing. The Maywood Site has certain soil types that are not suitable for processing. These materials include pond sediments buried throughout the site that account for as much as 75,000 cubic yards (cy) of the total construction volume. As the volume of material that is not suitable for processing increases, construction rates must increase to maintain an optimal feed into the system. The ability to increase construction rates is constrained by property access and budgetary constraints. Finally, unit costs are increased if recovered material is not suitable for reuse onsite. Factors affecting reuse suitability include potential chemical contamination and additional processing cost to achieve required physical characteristics (i.e., permeability).

Assuming the highest experienced recovery from the RSS, favorable cost performance of the GSS-RSS process scenario is only achieved when all recovered material is suitable for onsite reuse and the percentage of unsuitable material is less than 50%. Cost performance improves as construction rates increase, however, the ability to achieve these rates is problematic due to the conflicts with ongoing commercial business enterprises. Stockpiling material onsite for intermittent process operations is not considered possible due to physical and operational constraints of the site and public agreements that limit the size of onsite stockpiles.

Given questionable performance of the RSS with the Maywood Site soil conditions, a GSS-only process option was considered. Analysis indicates that the volume of coarse material present in Maywood Site soils is not sufficient to support favorable cost performance over the base case. The Feasibility Study estimates the total volume of processible soil at 66,583 cy. Based on a 15% coarse fraction recovery over the entire project, the recoverable volume is approximately 10,000 cy.

Neither the RSS nor the GSS is recommended for use at the Maywood Site. The RSS was not able to reliably process Maywood Site soils. The degree of soil mixing and false acceptance errors limits the acceptability of this technology at the Maywood Site. The GSS-only process is not recommended due operational and logistical constraints that limit the ability for cost effective implementation.

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1.0 INTRODUCTION

This report presents the results of a Pilot Demonstration performed by Stone & Webster, Inc. (Stone & Webster) for the United States Army Corps of Engineers (USACE) at the Maywood Interim Storage Site (MISS). This Pilot Demonstration was the culmination of efforts to evaluate the benefit of implementing soil volume reduction technologies at the FUSRAP Maywood Superfund Site (FMSS), shown on **Figure 1**. Initial analyses performed at the site indicated that volume reduction of radiologically contaminated material was viable and that this reduction could result in cost savings during remediation. It could also provide several ancillary benefits, including mitigation of community impacts and reduction of material transport and disposal costs. The purpose of the Pilot Demonstration was to validate and quantify these potential benefits.

1.1 BACKGROUND

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) establishes preferences that remedial actions utilize alternative treatment technologies to the maximum extent practicable in providing permanent and significant reduction of toxicity, mobility and volume of hazardous substances, pollutants or contaminants (U.S. Congress 42USC9621, 2000). Additionally, the National Oil and Hazardous Substances Contingency Plan (NCP) mandates that an assessment be performed to determine the extent to which the remedy employs recycling or treatment to reduce toxicity, mobility, or volume of hazardous substances, pollutants, or contaminants (USEPA 40CFR300.430, 2001). Pursuant to these regulations, the evaluation of waste volume reduction has been a stated objective of the FMSS since the project was initiated. In support of the volume reduction initiative, soil processing technology alternatives were identified for evaluation in a soil processing demonstration project.

A portion of the FMSS is located on the former site of the Maywood Chemical Works in Maywood, New Jersey. The chemical works manufactured a variety of industrial products, some of which involved the processing of thorium and lithium compounds. Historical records of the chemical works suggest that wetlands on the western portion of the property were filled, as needed, to support facility expansion. Additionally, retention ponds were constructed on the western end of the property in order to stabilize and store residual waste slurries and unrecoverable wastes from the manufacturing processes.

Previous remedial investigations and characterizations of the FMSS during the 1980s and early 1990s have shown that the property soils are contaminated with radioactive material, primarily in the form of thorium-232 (Th-232), radium-226 (Ra-226), and uranium-238 (U-238), as well as various other non-radiological contaminants. Remediation will necessitate the identification, removal, transport, and disposal of contaminated surface and subsurface soils.

Given the radioactive materials present at the FMSS, a limited number of options are available for reducing the volume of soil disposed of as radiologically contaminated material. The most suitable options are physical separation techniques. By employing a soil processing technology that can separate soil that is radiologically below criteria from soil that is above criteria, remediation costs may be reduced through more efficient soil management. For this Pilot Demonstration, soil management relates to such aspects as soil excavation, transport, processing, staging, and ultimate disposal. Soil management can result in the creation of several streams, each with different handling requirements ranging from offsite disposal to reuse at the FMSS.

In the later part of the 1990s, further characterizations and treatability studies were performed on the soils of the FMSS. The intent of these investigations was to identify soil groupings throughout the site and determine if particle-size separation techniques would be effective in separating the excavated volume of material into contaminated and non-contaminated fractions. Information from geologic borings from site characterizations completed during the 1980s and late 1990s was used to support these characterizations and treatability studies.

The treatability studies evaluated costs for implementing soil separation technologies at the FMSS. Essentially, the treatability studies were performed in two parts.

1. Characterization of the FMSS soils
2. Development of a conceptual flowsheet, or process simulation, for a production-scale soil treatment plant

The conceptual flowsheet used mathematical modeling of the results of the site characterizations to assess the feasibility of selected separation technologies in providing volume reduction of the contaminated fractions. Results from the soil treatability studies concluded that significant cost savings might be realized by combining soil processing and reuse of below criteria soil at the FMSS; and that a further assessment of soil processing technologies and potential application at the FMSS was warranted.

An evaluation of processing options required an identification of appropriate technologies for the FMSS specific soil groups and an economic evaluation of each. The effectiveness of the system types being considered relies on specific characteristics of the feed soil. The two principal characteristics are grain size and contaminant distribution. Both characteristics can be measured with relative ease, and reasonable estimates of the potential success of the processing systems can be made. A technology evaluation was performed in early 1999 to assess the viability of implementing physical separation technologies at the FMSS. The technology evaluation is summarized in the following section.

1.1.1 Technology Evaluation

The technology evaluation served to identify systems within three categories of soil processing technologies.

1. Gravel separation
2. Radiological soil sorting
3. Soil washing

Vendors provided system information in response to a questionnaire. Vendor information was evaluated and each system numerically ranked using a set of evaluation criteria and weighting factors that were relevant and appropriate to the assessment and reflective of the following criteria:

- Efficacy
- Safety
- Environmental
- Schedule
- Cost

The gravel separation operation is basically a coarse screening system to remove material greater than 6 inches in nominal diameter, followed by a vibrating screen that removes soil particles greater than 3/8 inch in nominal diameter. The removed greater than 3/8-inch material is then rinsed in a closed system.

Radiological soil sorting is a process that continuously assays a soil stream and directs soil that exceeds a selected threshold activity level to an above criteria stockpile. The remaining soil with radioactivity less than the selected threshold value is directed to a below criteria stockpile. Radiological sorting is most effective when the contamination is not homogeneously distributed in the soil mass. That is, there is a significant variation in the activity level within the soil being processed, some above criteria and some below.

Soil washing is a water-based process for scrubbing soils ex-situ to remove contaminants. The process removes radioactive contaminants from soils, or reduces the volume of contaminated soil, through particle size separation, gravity separation, and attrition scrubbing. The concept of reducing soil contamination through the use of particle size separation is based on the finding that contaminants of concern originate as smaller particles. Washing processes that separate the fine (i.e., small) clay and silt particles from the coarser sand and gravel soil particles effectively separate and concentrate the contaminants into a smaller volume of soil that can be further treated or disposed.

As part of this evaluation, an economic assessment was prepared that compared the total remediation cost for the site utilizing a variety of technologies. Due to the uncertainties in some key variables, including the fraction of material below cleanup criteria and soil grain sizes, a parametric study was performed to examine the potential cost savings for a range of values for these parameters. The results of the parametric study indicated that the economic benefits of performing volume reduction on the FMSS soils were viable for the anticipated remedial action. The data available during the technology evaluation process were insufficient to select a specific technology or technologies for pilot testing. Therefore, a limited test pit program, summarized below, was implemented in order to design a site-specific Pilot Demonstration.

1.1.2 Engineering Test Pit Program

In August of 1999, an engineering test pit program was performed to gather more detailed information on subsurface soils (USACE, 1999c). The objective of the engineering test pit program was to provide an engineering correlation between data from the test pits and previous data that was generated from soil borings. Specifically, the test pit program was used to:

- Verify the data contained in the boring logs for the site
- Provide additional information on grain size distribution across the site
- Identify the activity distribution associated with grain size
- Provide information on the heterogeneity of radiological contamination
- Provide information to facilitate system selection and sequencing
- Identify appropriate areas for soil acquisition representative of conditions likely to be encountered during full scale operation

Findings from this test pit program concluded that the majority of the contamination was associated with the less than 3/8-inch. The soils at the portion of the site that was evaluated could generally be divided into the following zones: overburden, retention pond, surrounding, and lower. The coarse fraction was found to be associated primarily with the overburden and surrounding soil and on average accounted for 15% of the material by weight. The lower zone soils (below the retention pond level) generally appeared to be both radiologically and chemically uncontaminated. The distribution of radiological contamination at the MISS showed a high degree of heterogeneity as supported by historical data and confirmed by the test pit data.

Information collected during the test pit program revealed that the use of soil processing and separation was a viable option for the site. Additionally, the degree of heterogeneity of radiological contamination enhanced the potential benefits of the soil separation process.

In addition, the engineering test pit program found that chemical contamination existing at the site had the potential for exceeding certain cleanup criteria. While the chemical contaminants would not affect the pilot plant's process, they may have an effect on possible soil reuse or offsite disposal options. Therefore, in situ material was sampled for chemical contaminants prior to excavation for the Pilot Demonstration to characterize the material to be processed. Material processed during the Pilot Demonstration was sampled to determine if chemical contaminants were being concentrated in the resultant process streams.

1.1.3 Pilot Demonstration

Based on the results of the technology evaluation and the test pit program, a Pilot Demonstration consisting of two technologies was recommended.

1. A dry gravel separation with an associated rinse unit
2. A radiological sorting system

The engineering test pit program found substantial quantities of non-radiologically contaminated material greater than 3/8 inch in diameter, supporting gravel separation. An underlying premise of the Pilot Demonstration based on these soil analytical results was that the material above the selected radiological criteria was limited to soil particles less than 3/8 inch in diameter. A dry gravel separation system was selected to minimize water usage and to simplify the management of the process waste streams. The test pit program also confirmed that in situ contaminant distribution supported proposing radiological sorting for the Pilot Demonstration.

The Pilot Demonstration focused on determining the effectiveness of the two technologies in separating excavated material into components above and below selected radiological criteria. The operating performance of the Pilot Demonstration System was also used to evaluate potential cost benefits of the technology. The demonstration was conducted such that all required system operational and soil contaminant data were collected to evaluate the systems' performance and reasonably project and establish full-scale system design / performance economics.

1.2 OBJECTIVE

The objective of the Pilot Demonstration was to evaluate the applicability of the gravel separation and radiological sorting technologies to the FMSS soils. Success of this objective will be measured by the effectiveness of the soil processing technologies to:

- Significantly reduce the volume of radiologically contaminated soils requiring off-site disposal
- Provide community benefits relating to reduced waste transport and disposal
- Reduce costs in remediation of the FMSS

1.3 APPROACH

During the operation of the Pilot Demonstration program, the process technologies were evaluated by measuring the radiological contamination, chemical contamination and weight of pre- and post-processed materials. The following determinations were made during the demonstration.

- Characteristics of the soils prior to processing (radiological, chemical, and physical)
- Impacts that excavation and soil handling had on the contaminant distribution in the processed soil and its impact on soil processing
- Radiological characteristics of the separated soil to evaluate how effectively soil processing separated below criteria soil from radiologically contaminated soil
- The effect of soil processing on chemical and physical characteristics of the separated soil
- Evaluation of soil disposal and reuse alternatives
- Evaluation of costs effectiveness of implementing the technologies in a full-scale operation

2.0 EXECUTION OF WORK PLAN

Stone & Webster completed a Pilot Demonstration project to evaluate two technologies

1. Material separation based on grain size
2. Soil sorting based on levels of radiological contamination

The Pilot Demonstration processed approximately 8,000 tons of representative site soil to quantify applicability of these technologies for the full-scale FMSS remedial effort. The systems used, the soil acquisition areas where representative soil samples were obtained, and the data collection process are described separately below. Photographs of the Pilot Demonstration are included in Appendix A.

2.1 SYSTEM DESCRIPTION

2.1.1 Gravel Separation System

A gravel separation system was used as the initial step in the Pilot Demonstration. The gravel separation system consisted of two main groups of components

1. The Gravel Separation System (GSS)
2. The gravel rinse unit

Figure 2 shows the equipment layout of the individual units that comprised the pilot plant. The gravel separation operation used a coarse screening system (grizzly) to separate material greater than 6 inches in nominal diameter, followed by a vibrating screen that separated soil particles greater than 3/8 inch in nominal diameter. After the vibratory action, two streams were formed from the separation.

1. Material greater than 3/8 inch but less than 6 inches
2. Material less than 3/8 inch

The separated material greater than 3/8 inch was then conveyed through a radial conveyor belt to the rinse unit. Within the enclosed rinse unit, the gravel was sprayed with water to remove adhering fine sand and silts. The rinse water passed first through a sedimentation tank to settle out fines, then through a filtration system to remove the remaining fines. The filtered water was then recycled through a fractionation tank back to the rinse system forming a closed system (see **Figure 2**). There were no surfactants or solvents added to the rinse water. Samples were collected of the recycled water and submitted for alpha spectrometry analysis. The alpha spectrometry data are summarized in **Table 1**.

The less than 3/8-inch material stream was directed via a conveyor to a feed hopper for the radiological sorting system. On occasion, this stream was diverted to a less than 3/8-inch material stockpile in order to assess the gravel separation unit's ability to run at full capacity.

2.1.2 Modifications to the Gravel Separation System

Throughout the course of the Pilot Demonstration, field observations revealed that modifications to the GSS and Rinse Unit were necessary in order to accommodate material being processed. The modifications for these systems and the degree of success of each were as follows:

- Altered openings on the grizzly deck from 6-inch squares to 6-inch slots reduced the amount of entanglement caused by geotextile fabric, polysheeting, and liners within the soil. The grizzly's automatic hydraulic lift arm was also modified to allow for a greater than 90 degree tilt angle, which allowed for easier removal of the greater than 6-inch material.
- The top screening deck of the GSS was modified from 1-inch squares to 1-inch slots. This allowed material to pass to the second screen more easily.
- The top screening deck of the rinse system was replaced with a 4-foot by 1/2-inch opening screen, and 1-inch rubber dams were installed to increase the time in which the gravel was in direct contact with the rinse water. This produced a visually cleaner product.
- The orifice on the spray bars of the rinse unit were changed and required continuous adjustment to maximize the quality of the rinse product.
- Due to the characteristics of the material being processed, a higher than designed volume of water was used within the rinse system to remove cohesive silts and clays adhering to the gravel. The filtration unit was initially designed to handle flow rates ranging from 50 gallons per minute (gpm) to 200 gpm water rinse rate. Actual rates, however, ranged from 300 to 500 gpm. These higher rates required that additional pumps be added to the system and entailed the construction of a sedimentation tank to capture the excess fines exiting the rinse unit. However, the construction of the sedimentation tank lacked the proper length to allow appropriate residence time in order for the fines to settle and not overwhelm the filtration system.
- A high pressure blower was added as the final cleaning step after the gravel was rinsed. It helped to remove mud that had formed but was not removed during the rinse process.

2.1.3 Radiological Sorting System

A Radiological Sorting System (RSS) was used as the second system for the Pilot Demonstration. The RSS received the soils processed by the gravel separation system.

Material that was less than 3/8 inch in nominal diameter was fed to the RSS via conveyor from the GSS. The material entered a grizzly with a 1 1/2-inch screen to remove gravel that might not have been removed by the GSS. The material was then spread to a 2-inch thickness and conveyed under two sets of eight Sodium Iodide (NaI) detectors. These were calibrated for detection of Th-232, Ra-226, and U-238. The detectors performed a continuous assay of the material. The detector then signaled the segmented gates, which actuated to divert soil that was below the selected threshold level to a below-criteria stockpile. When soil was above the threshold criteria, the gates remained unactuated and soil fell past the gates and was directed to an above-criteria stockpile. **Figure 3** is a schematic of the process flow through the RSS. Threshold values were varied throughout the Pilot Demonstration to:

1. Test the range of values that potentially could be used as clean-up criteria during the full-scale remediation
2. Test the range of values that potentially could be used as acceptance criteria for alternative off-site disposal

For quality assurance, the Pilot Demonstration included methods for checking for increased background radiation. These included scans on empty conveyors, daily checks / calibrations of the detectors, and confirmatory sampling on output piles. The operation of the RSS is described in the RSS Technology Description presented in Appendix B.

2.2 SOIL ACQUISITION AND EXCAVATION

A key component of the Pilot Demonstration project was the identification of an area from which soil representative of the entire FMSS could be excavated. After review of the available data, Stone & Webster selected the area west of Building 76, as shown on **Figure 4**. Existing records showed that the area west of Building 76 on the MISS property had soil that was contaminated with radioactive materials, and that the contamination was not evenly distributed through the soil mass. This area also contained fine grained lagoon sediments, and granular "overburden" and "surrounding" soil as defined in the report entitled *Results of 1999 Engineering Test Pits Program at MISS*. Contamination in the soil west of Building 76 was generally shallow and accessible without having to remove large quantities of "clean" overburden. The area consisted of gravel, sandy-silt, and silty-sand. This area was identified as the Soil Acquisition Area (SAA).

The dimensions of the planned excavation were approximately 190 by 165 feet at the ground surface, excavated to 6 feet in depth with a 1.5(H) to 1(V) slope at all sides. The excavation began about 65 feet west of Building 76, along the northern boundary of the SAA, and projected about 40 feet into Retention Pond A. The surface area excavated was partitioned into two areas identified as Stages I and II. Based on previously collected data, the Stage I excavation area was thought to be predominantly granular soils while the Stage II excavation area represented the retention pond sediment covered with granular overburden.

During excavation activities, observations of the conditions of the SAA were noted. Modifications to the original excavation plan were put into effect due to, such things as, abandoned building foundations, discovery of a drum of unknown contents, and difficulty in processing pond material through the systems. These are discussed further in Section 3.0.

2.3 DATA COLLECTION

Prior to excavation activities, a grid system was established within the entire SAA. Each grid was 5 by 5 feet and varied in depth depending on the material to be processed on a specific day. The grid system was established to aid in the designation and tracking of soils during excavation and processing. The surface of the soil to be excavated was scanned using a linked NaI-Global Positioning System (GPS) (See Appendix C – NaI-GPS Walkover Surveys). Areas of soil were referenced to the grid to locate and document radiological contamination. The radiological contamination mapped by the linked NaI-GPS was used to guide the excavation. The grid system was used to select the soil to be processed. The volume of soil processed was known as either a “batch” or a “slug” (see Appendix D for a description of the “slug” and “batch” processing concept). A batch of soil was processed through the system and results were used to assess the systems under full-production efforts. The batches were defined prior to excavation, and fulfilled the characteristics of one of the following scenarios:

1. Granular material to be processed through the gravel separation system only
2. Granular material with radiological activity near the cleanup level
3. Granular material with radiological activity near the offsite disposal facility acceptance criteria
4. Retention pond material with radiological activity near the cleanup level
5. Retention pond material with radiological activity near the offsite disposal facility acceptance criteria
6. Material that is above the cleanup criteria (i.e., hot spot)

7. Material that is below the cleanup criteria (i.e., below criteria)
8. Material that is a combination of both above and below criteria
9. Retention pond material to be processed through the gravel separation system only
10. Retention pond material processed through the soil sorting system only (not included in the original work plan)

Once a batch was designated, a smaller subset of the batch, known as a “slug” was selected. This smaller, more manageable quantity of soil was used to track activity and weight to compare pre-processing radiological measurements with those of the separated stockpiles at the conclusion of the processing. The slug data was used to evaluate mixing / dilution of soil contamination resulting from excavation, handling and processing. Section 4.4.1 evaluates slug activity tracking. The slug was not intended to represent the batch and a slug was not designated for every batch.

Throughout the course of the Pilot Demonstration, substantial sampling of both the slug and batch was performed. Approximately 13 slugs and 40 batches were chosen for processing through the gravel separation and rinse unit, and the soil sorting system. Sampling frequencies were dependent on the volume of soil being processed. Refer to **Tables 2** and **3** for sampling frequencies and sequence. The frequency of sampling increased during slug processing to gather sufficient quantities of detailed data to evaluate the mixing / dilution effects caused by soils handling.

A slug consisted of 9, 5 by 5-foot grids that were established within the soil acquisition area. Depths of excavation within this grid varied throughout the Pilot Demonstration field activities, and are explained further in Section 3.4. In order to locate an appropriate sampling location within each slug, a NaI-GPS walkover was repeated for each grid (refer to Appendix E). An average count rate for each grid was determined, and a grab sample was collected at that location to represent that grid. The sample was sieved to less than 3/8-inch material and then sent to the onsite laboratory for gamma spectroscopy analysis. Supplementary QA/QC samples were also collected and sent off-site. After a sample for each grid was collected, the slug was then excavated and stockpiled for processing. Samples were collected from three locations during the processing of the slug. The first location was the less than 3/8-inch material at the output of the GSS / input to the RSS. The second and third locations were the below and above criteria conveyors at the discharge of the RSS. The samples were collected at 10-minute intervals at each of the three locations in order to represent the total volume of the slug being processed. Each sample collected for this process was treated as a discrete sample and each was analyzed individually.

After the slug processing was complete, the associated batch was then excavated and stockpiled. The batch was used to simulate full-production level efforts. Batch sampling data was primarily used to evaluate the effectiveness of the processing systems and determine options for final disposition of the processed materials. Samples were also analyzed to determine if chemical contaminants became concentrated in the individual process streams (see Section 5.3). Samples were collected at varying points during processing. An initial sample was collected from each stream at the 1 cubic yard (cy) mark and then every 50 cy thereafter. The process streams consisted of:

- Greater than 6-inch material
- 3/8- to 6-inch material
- Less than 3/8-inch material

The less than 3/8-inch process stream was assayed by the radiological sorting system and directed into the above or below criteria stockpiles. The sorting criteria were varied during the Pilot Demonstration to evaluate performance at a range of likely clean-up criteria. Samples collected from these varying streams were analyzed for both chemical and radiological parameters. See Appendix F for chemical and radiological lab results. Supplementary QA/QC samples were also collected and submitted for analysis. In addition, some samples were collected between the gravel and the rinse system and associated water recycling system to evaluate the applicability of the rinse unit in cleaning of the gravel. Note that the diameter of gravel sampled at this location and post rinse was limited to sample container size. Refer to Section 4.1.2 for evaluation of the rinse system. These samples were analyzed by gamma spectroscopy only.

During the course of the Pilot Demonstration, the physical characteristics of the material processed were also evaluated. Such aspects as grain size, moisture content of pond material, and debris within the soil were observed and are discussed in later sections of this report.

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3.0 DEVIATIONS FROM THE WORK PLAN

The work plan for the Pilot Demonstration was prepared using the information available. Field conditions encountered during the Pilot Demonstration were, in several instances, different from conditions that were anticipated in the work plan. These changed conditions required field modifications to the work plan. The changed conditions and the modifications to the work plan are described separately below, and project records have been updated accordingly.

3.1 POND MATERIAL

There was an attempt to process pond material using both the GSS and RSS. The pond material contained a moisture content greater than 40%, and an initial attempt to process the material was unsuccessful. High moisture content caused the screens in the GSS to clog and interfered with RSS operation. This, in turn, limited the ability to analyze the RSS effectiveness on segregating pond material. This material was therefore not processed for the remainder of the Pilot Demonstration. The Pilot Demonstration determined that in its current state, pond material could not be processed through either the GSS or the RSS.

During field activities test pits within the SAA indicated pond depths in excess of 14 feet below ground surface (bgs). This contributed to the abandonment of excavation activities of this material due to greater volumes than originally anticipated.

3.2 MODIFICATIONS TO EXCAVATION PLAN

Since pond material could not be processed and reached depths in excess of 14 feet bgs, excavation of pond material was abandoned.

Remnants of a concrete foundation were exposed during excavation activities within the SAA. To demolish and remove the foundation, specialized equipment beyond the scope of the Pilot Demonstration would have been required.

During excavation activities in Stage II of the SAA, a drum with unknown contents was discovered. Work in this portion of the SAA was stopped and excavation in the area was abandoned.

3.3 SCENARIOS

As part of daily soil processing, batches were named after one of nine scenarios described in Section 2.3 of this report. During the Pilot Demonstration, field conditions revealed that processing of soil for all ten scenarios could not be achieved. Scenarios 4, 5, 9, and 10 were eliminated due to difficulty experienced in processing the pond material.

The final cleanup criteria and disposal criteria were not known during the field activities. As a result, the threshold criteria for the RSS unit were varied between potential cleanup levels and possible alternative off-site disposal scenarios to enable direct evaluation of the system when the final cleanup level was ultimately selected.

3.4 EXCAVATION CUTS

It was difficult to maintain the heterogeneity in the excavated material when strictly utilizing a 1-foot cut. The equipment used to excavate the soil (backhoe) tended to mix the excavated material rather than "scoop" the soil when the cuts were shallow. Based on this observation, the excavation approach was modified from 1-foot to 3-foot deep cuts to accommodate the equipment and help maintain heterogeneity in the material.

3.5 SEQUENCED BATCH

The Pilot Demonstration Work Plan identified two methods of feeding the soil processing units(s): batch and slug. Descriptions of slug and batch excavations are also presented in Section 2.3. During the demonstration, a third method of feeding the soil processing unit(s) was developed and implemented. This method was named a Sequenced Batch based on the associated excavation, stockpiling, and the sampling applied.

3.5.1 Background

Several observations were made during the field operations suggesting that modification to the excavation methods being employed at the SAA would give additional insight and performance improvement to the pilot system. During normal batch operations, soil excavated from the SAA would be placed in a feed stockpile. Multiple truckloads of soil were incorporated in the stockpile making differentiation of the individual truckloads impossible. A 6-cy bucket loader was used to convey soil from the feed stockpile to the gravel separation feed hopper. The bucket loader would, at times, obtain soil from the same point in the stockpile that the trucks were dumping. The additional handling and mixing of individual loads of the excavated soil and the "dressing up" of the stockpile by the equipment operator resulted in additional loss of soil contaminant heterogeneity. The loss of heterogeneity reduced the effectiveness of the RSS, which operates more effectively when heterogeneity is preserved (refer to Section 4.1.3, Radiological Sorting System).

3.5.2 Description of Sequenced Batch

In response to these observations, a Sequenced Batch method of excavation and handling was developed in the field. The new method changed primarily the way the soil was staged (stockpiled) in the operations area and minimized the extra handling of the excavated soil. The Sequenced Batch excavation and material handling procedure was specifically designed to persevere the heterogeneity of the soil from the SAA to the extent possible. Appendix G represents sequenced batch coordinates and walkover surveys. During soil acquisition, soil was systematically excavated in bucket-wide strips from one side of the excavation to the other. For example, if the excavation called for a 3-foot deep cut, the excavator made a 3-foot cut and advanced the grade by making a series of strip cuts across the proposed excavation area. Each bucket was placed into the truck upon excavation. Each truck, when filled, was sent to the operation pad and dumped to form a discrete pile. The identity of each pile was maintained by directing each truck to dump in a designated location. When sufficient soil had been stockpiled, soil processing was initiated. Soil was fed to the soil processing units from each single dump stockpile in the same sequence it was dumped (first in, first out). As a stockpile area was processed, a new load was dumped. The first in, first out dump / load sequence was continued to the completion of the sequenced batch.

3.5.3 Observations

The excavation and handling of the soil using the sequenced batch method resulted in two observations that demonstrated the advantage and applicability of the method.

1. The sequenced batch method resulted in minimizing the blending of the soil and the homogenization of the batch soil. This reduced blending was intended to enhance the performance of the RSS by maintaining soil contaminant heterogeneity. During the sequenced batch operation, radiological sorting was anticipated to correlate well with the results obtained during the NaI-GPS walkover. However, this anticipated correlation was not in fact evident. The weak correlation between walkover survey results and RSS performance may be attributed to both, either from adjacent radioactive soils not included in the batch, shielding of buried soils by relatively less contaminated material, or both.
2. The excavation and special stockpiling maneuvers did not substantially lower the rate of the excavation. Continuous excavation was maintained by cycling two trucks between the operations area and the soil acquisition excavation. The sequenced batch method of excavation could be easily adapted to full-scale operations. The stockpile footprint, though larger than what would be needed if more standard stockpiling techniques were employed, would not be excessively restrictive.

3.6 SAMPLING DEVIATIONS

Deviations from the Sampling and Analysis Plan (SAP) (Volume 4 of the Work Plan) were executed due to changes in field conditions. The following stockpiles (see SAP, **Figure 2**) were not sampled as initially intended in the SAP:

- Stockpile B: Retention pond material was not processed or excavated as described previously; therefore, sampling was not conducted
- Stockpile I: Filter cake material was not produced by the rinse unit's filtration system as expected; therefore, sampling was not necessary
- Stockpile K: No material was excavated that was not processed through the Pilot Demonstration system; therefore, this stockpile was eliminated from the sampling sequence

3.7 STAGE III ACTIVITIES

Within the Pilot Demonstration Work Plan, Stone & Webster states that Stage III activities will be completed once sufficient data were collected to adequately evaluate the performance of the soil processing systems. These activities may have included testing of various screening techniques, testing of throughput limits of soil management systems, compaction method testing, implementation of the MARSSIM Final Status Survey Methodology, and evaluation of techniques for surface water control and management. Stage III activities were not completed due to the extent and depth of contamination, and due to unexpected pond sediments and other obstructions encountered during excavation activities that required portions of the SAA to be abandoned.

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4.0 PROCESSING PERFORMANCE DATA

4.1 PROCESSING SYSTEM COMPONENTS

The processing system was composed of two principal subsystems: the GSS and the RSS. The GSS performed physical size segregation, removing first rock and debris with a diameter of 6 inches or more with a passive coarse screen (grizzly) followed by removal of 3/8 to 6-inch fraction using a set of two graded vibratory screens. A rinse unit, which was comprised of a rinse system and associated water recycling system, was also provided to determine the effectiveness of gravel rinsing to remove adhered fines from the 3/8- to 6-inch fraction. The less than 3/8-inch size fraction was then conveyed to the RSS for radiological separation. Each of these system components was evaluated during the Pilot Demonstration. **Figure 2** shows the locations of equipment and various stockpiles discussed below. **Figure 3** shows the process flow through the system.

4.1.1 Gravel Separation System

The GSS consisted of a passive 6-inch grizzly and a 2-stage vibratory screening plant. Raw excavated soil was transported to the feed stockpile (Stockpile C, **Figure 2**) from the SAA. Stockpiled soil was then passed through the grizzly using a front-end loader. Material greater than 6 inches was selectively rejected by the grizzly. This oversize material was periodically collected using a front-end loader and placed in a segregated storage pile (Stockpile E, **Figure 2**).

Material less than 6 inches was transported by a conveyor belt to the two-stage vibratory screening plant, where material greater than 3/8 inch was retained and material less than 3/8 inch passed through the screen and was conveyed to the RSS. The 3/8 to 6-inch material from this process was transported by a conveyor belt either to the gravel rinse unit or to a stockpile (Stockpile J, **Figure 2**). Based on previous information, the GSS was expected to remove 15% of processed material as 3/8 to 6 inches. However, their removal rate varied from 17.4 to 47.8% for the course of the field program, with a total average removal rate of 32%. **Table 4** reports removal percentages on a batch basis. (Field measurements were made on a weight basis. The bulk density for gravel and soil was assumed equal in the analysis.)

Production rates for the GSS ranged from a minimum of 2.64 tons/hour to a maximum of 160.84 tons/hour. The average production rate for the course of the field program was 37.83 tons/hour. Rates were calculated by dividing the weight of material processed that day (in tons) by the “working hours” for that day. Such things as breaks, morning meetings, and weather related issues were subtracted from the scheduled 10-hour workday to determine the “working hours”. Low production rates were not due to lack of available feed stock or GSS limitations. Under full-scale operating conditions, the GSS would be expected to operate at or near the observed maximum throughput rate, or approximately 150 tons/hour. **Table 5** summarizes production rates on a daily basis for the course of the Pilot Demonstration.

4.1.2 Rinse Unit

The rinse unit, which was comprised of a rinse system and associated water recycling system, was provided as an integral part of the GSS. Oversize material from the vibratory screens was passed through the rinse unit. The rinse system consisted of a deck of three graded static screens with integral rinse bars to continuously spray water over the gravel as it passed through the system. Washed gravel was conveyed to Stockpile J (**Figure 2**). Water and entrained fines flowed first to a sump, then a sedimentation tank, and finally through a filtration system. Filtered water was collected in a fractionation tank and sent back to the rinse water supply tank to maintain a closed system. The fines that were periodically recovered from the sump were disposed of at the load out area with the processed material.

4.1.3 Radiological Sorting System

The RSS is a transportable gamma radiation detection system designed to sort soil based upon measured activity level. It consists of a motorized conveyor belt, which passes a uniform geometry of soil beneath two banks of NaI detectors. The detectors assay the soil to determine the activity level and send the information to an integrated computer. The computer processes the information to determine what portion of the soil is below the pre-set criteria, and sends instructions to air actuated gates at the end of the conveyor to actuate and catch below-criteria soil as it falls from the conveyor. Material caught by the gates is conveyed to a below-criteria stockpile. The remainder of the soil falls past the gates and is conveyed to an above-criteria pile.

The sorting conveyor, detector arrays, segmented gates, and all downstream conveyors and subsystems were controlled through the computer, which was located in a mobile van near the RSS (see **Figure 2**).

4.1.3.1 Material Flow

Soil material less than 3/8 inch was transported from the GSS by conveyor belt to a surge hopper. From there, the material was fed onto another conveyor belt, through a leveling gate, and then into the RSS. The RSS was set to discriminate between soil containing activity levels greater than and less than set criteria values. Material that was above the set criteria values was diverted and carried via conveyor to a contaminated soil stockpile on one side of the unit (Stockpile G). Material that was below the set criteria values was carried via conveyor to a clean soil stockpile (Stockpile H) on the opposite side of the unit.

Production rates for the RSS ranged from a minimum of 1.16 tons/hour to a maximum of 25.26 tons/hour. The average production rate for the course of the field program was 14.56 tons/hour. **Table 6** summarizes production rates on a daily basis for the course of the Pilot Demonstration.

4.1.3.2 Theory of Operation

The computer made soil-processing decisions based on parameters entered by the operator. Soil greater than the selected criteria values fall onto a conveyor to a "contaminated pile." Soil that is less than the selected criteria values was sent through "gates" that funnel the clean soil to a different conveyor, and ultimately to a clean soil pile.

The RSS was setup for the Pilot Demonstration to use reject criteria values for both the individual segments seen by each detector, and for groups of 80 segments. The system used the two sets of reject criteria logic. Segments of material that are clearly much higher than the setpoint are sent to the contaminated material pile. The segments of material remaining are analyzed as an RSS batch, allowing for better counting statistics. System logic is discussed further in Appendix B.

The RSS as used at Maywood used two arrays of eight NaI detectors each. Windows are set in each NaI detector to look at total counts due to gamma interactions with the detectors for a given energy range. **Table 7** gives array specific detector information used, set up for the Pilot Demonstration. Note that although Array 1 detects gamma radiation from Ra-226 and Th-232, the RSS did not distinguish between these radionuclides. All of the counts detected in Array 1 energy window were treated as Th-232, the more abundant of the radionuclides of concern.

Detection and quantitation of U-238 is performed by a different array of detectors from those used for Ra-226 and Th-232. Operation of these detector arrays is also discussed in Appendix B. The output from the U-238 detectors is processed through a compensation software routine to eliminate the contribution of Ra-226 and Th-232 gamma radiation. The uranium compensation software originally did not compensate adequately for Ra-226 and Th-232 in the soil. The RSS calculated an artificially elevated U-238 activity, resulting in rejecting soil for elevated U-238 that was in fact well below the acceptance criteria for all contaminants of concern (COCs).

The uranium compensation software was disabled after August 18, 2000 pending software revisions. The Pilot Demonstration proceeded since radiological analysis of the Pilot Demonstration soils showed that U-238 activities were very much lower than the rejection criterion for this isotope. Analytical results confirmed that no material passing the radium+thorium criteria would have been rejected by a properly operating uranium detection and quantitation program.

On October 17, 2000, a revised compensation program was installed. The limited data collected after October 17, 2000 indicates that U-238 was still frequently over-quantified. Some slugs and batches run after this date may have been adversely affected by the inability of the RSS to accurately quantify the U-238 activity.

A dependable radium+thorium compensation program was not available during the course of the Pilot Demonstration. Consequently, no evaluation of the RSS to separately detect and quantify U-238 in the presence of other radionuclides could be performed.

4.1.3.3 Performance Capability

The RSS has been evaluated and used at a number of sites, including three that were contaminated with depleted uranium and / or natural uranium. Prior experience with the RSS indicated that:

- Moisture content of soil samples should be less than 20%
- Extensive pre-deployment site characterization is beneficial
- The soil contaminant should be heterogeneously distributed
- The method of excavation is essential to success i.e., to avoid soil mixing

The Lower Limit of Detection (LLD) of an instrument determines the ability of the instrument to detect levels of radiation above background. The LLDs for the RSS used for the Pilot Demonstration were determined using uncontaminated material as described in Appendix B. The measured LLDs were calculated at the less than or equal to 5% error acceptance criteria for false positive and false negative results. LLDs for the Pilot Demonstration RSS are presented in **Table 8**.

The LLD values given were determined based on background counts using clean backfill soil. As discussed in Appendix B, the RSS did not separately quantify Th-232 and Ra-226. All counts in detector Array 1 (**Table 7**) were treated by the RSS as arising from Th-232. The RSS results were reported as Ra-226 + Th-232.

4.2 INITIAL SOIL CHARACTERIZATION

4.2.1 Sampling and Analysis

4.2.1.1 Background

Soil from backfill at an off-site location was chosen to characterize background for the Pilot Demonstration. Two aliquots of a single grab sample were analyzed at the off-site laboratory. The measured values appear to be in the range expected for naturally occurring levels of these radionuclides.

The same soil was used to determine background levels and LLDs for the RSS unit as described in Appendix B. Laboratory and RSS background values are presented in **Table 9**.

4.2.1.2 Particle Size Analysis

Grab samples of less than 3/8-inch material were obtained from the RSS unit feed belt on four separate dates, September 14, October 2, October 6, and October 27, 2000, during normal operating activities. These samples were submitted to an off-site testing facility for grain size analysis. The individual size fractions recovered during grain size analysis were subsequently analyzed by alpha spectroscopy to determine the distribution of radioactive material with regard to particle size fraction for material greater than 200 mesh.

The result of the grain size analysis is presented in Appendix H. The result of the radiological analysis of the individual size fractions is presented in **Table 10**.

All of the four samples showed a general tendency for elevated radioactivity in the finer size fractions. In all four cases, the highest radioactivity in a size fraction was found in the #100 to #200 mesh fraction, with radioactivity generally declining with increasing size fraction. This supports the results of the test pit investigation that radioactivity is concentrated in the finer fractions on the site, supporting particle size separation as a useful technique for reducing the volume of material containing elevated radioactivity.

4.2.1.3 Slug Characterization

Each designated slug was sampled prior to excavation and processing (Appendix E). Slugs were divided into 9, 5 by 5-foot grids, each of which was sampled, providing 9 grab in situ samples per slug. The grab samples were screened to separate the less than 3/8-inch fraction. The less than 3/8-inch material was then analyzed separately for radionuclide content by gamma spectroscopy using the onsite radiological laboratory. One of the slugs, designated the "onsite slug," was obtained from an existing stockpile of excavated soil. The material from this slug was sampled as nine separate grab samples, as described previously. However, the SAA grid system was not used for locating or designating the grab samples since this material did not originate from the SAA.

Another slug, designated the "engineered slug," was manufactured by layering approximately equal volumes of rock dust and contaminated soil that had been previously processed through the system. The engineered slug was stockpiled first by placing the processed material (obtained from the above criteria stockpile from the previous run) onto the Stockpile C feed stock area (see **Figure 2**). Approximately an equal volume of rock dust was then placed on top of the processed material in the feed stock area. The total volume of the engineered slug was then treated in the same manner as all other slugs. This slug was characterized by analyzing three grab samples of each component prior to stockpiling.

The results of the slug characterization are presented in **Tables 11a – 11m**.

4.2.2 Field Measurements

Field measurements of radioactivity were conducted throughout the SAA as excavation activities proceeded. The results of these walkover surveys are presented in Appendix C. These surface radioactivity measurements were used to help select the boundaries of individual batches and assign the scenario to which they belonged.

In addition to the walkover surveys of the SAA, the individual slugs were surveyed in detail prior to excavation, and the observed counts recorded for each 5 by 5-foot grid. This information is presented in Appendix E.

4.3 GRAVEL SEPARATION

4.3.1 Quantities

The quantity of material removed by the GSS was determined for both batches and slugs. This information is presented in **Tables 12** and **13**. The total quantity of greater than 6-inch material was 2.46% by weight, including both slug and batch data. The total quantity of 3/8 to 6-inch material was 31.85% by weight.

4.3.2 Radiological Characteristics

The 3/8-inch to 6-inch material generated during batch processing was routinely sampled and analyzed for radioisotopes of concern. These analytical results are presented in **Table 14**. Analytical results presented in the table are total radionuclide activities not adjusted for background. The oversize material was generally lower in measured radioactivity than the associated fines from each batch that was analyzed. The oversize material had an average Th-232 activity of 5.60 pCi/g, with an average Ra-226 of 1.52 pCi/g and U-238 of 2.81 pCi/g. The highest activity associated with the oversize material was 24.4 pCi/g Th-232 found in Sequence Batch #5. The highest observed Ra-226 and U-238 activity was 5.12 pCi/g and 9.48 pCi/g, respectively, in Batch #13 1-5. Based on the results of tests conducted using the rinse unit discussed in Section 5.3.3, much of the radioactivity, particularly the Th-232 component, is contributed by the residual fines adhering to the oversize material.

The measured radiological properties of the oversize material are not strictly representative. The oversize fraction contains individual particles up to 6 inches in diameter. Radiological analysis by gamma spectroscopy could not accommodate individual particles greater than about 1.5 inches in diameter. As a result, the reported radioactivity associated with the oversize material is artificially elevated by an indeterminate amount.

The rinse unit was not generally used during the Pilot Demonstration. The fines generated by the rinsing operation quickly clogged the filtration system. The fines were of smaller size and in greater quantity than anticipated. Consequently, relatively little data was generated on the radiological characteristics of oversize material (greater than 3/8 to 6-inches) before and after rinsing.

Data were gathered for five tests of the rinse unit using both fresh water and recycled water for the rinse. Substantial reductions of radioactivity were achieved, particularly for Th-232. Absolute activities of Ra-226 and U-238 were, on average, lower than Th-232 activities in the oversize material prior to processing through the rinse unit. Changes in Ra-226 and U-238 were less pronounced than those for Th-232 following rinsing. The results of radiological analysis of oversize material before and after rinsing are found in **Table 15**.

4.4 RADIOLOGICAL SORTING

The RSS was operated for both slug and batch testing. The results of each type of test are presented in the following sections.

4.4.1 Slug Tests

Slug tests were run on 11 well-characterized slugs of soil from the SAA. Two additional slugs originated on the MISS from previously excavated and stockpiled material. Therefore, a total of 13 slugs were processed during the Pilot Demonstration. The first slug, the “onsite slug,” was processed on August 17, 2000. The final slug, 6-3, was processed on October 20, 2000.

Each slug was analyzed for radioactivity prior to processing. Samples of the feed material (less than 3/8-inch) to the RSS were obtained prior to processing, as were samples of the below-criteria and above-criteria material after sorting. These results were compared with the in situ grab sample analytical results, obtained prior to excavation, and to the measurements recorded the RSS instrumentation array to determine the effectiveness of the RSS. The analytical results from the slug tests can be found in **Tables 11** and **16**. Slug test laboratory radioisotope activities included native background contributors estimated as presented in **Table 9**. The RSS operated using background subtraction techniques as described in Appendix B.

A variety of setpoints for radium+thorium were used to evaluate the performance of the RSS at several different radiological criteria. Radium+thorium setpoints of 5, 10, 15, and 24 pCi/g were used during slug processing. Eight slugs were processed using a 5 pCi/g setpoint for radium+thorium. One slug was run using a setpoint of 10 pCi/g. Two slugs each were processed at 15 and 24 pCi/g.

4.4.1.1 Slug Test, Ra + Th Setpoint of 24 pCi/g

The highest setpoint, 24 pCi/g, was used for slugs 6-2 and 8-3. The material used for slug 6-2 contained radium+thorium uniformly above the setpoint activity based on nine in situ samples taken prior to excavation of the slug. Most of the material (23,400 pounds) was rejected by the sorter as containing radioactivity above the setpoint. Radiological analysis of the rejected material confirmed that it contained radium+thorium in excess of the setpoint. Approximately 1000 pounds of material from slug 6-2 (approximately 4%) was accepted by the RSS. Radiological analysis of soil from the below criteria stockpile showed that it contained radioactivity in excess of the setpoint.

The material used for slug 8-3 also contained radium+thorium approximately equal to the setpoint activity based on nine in situ samples taken prior to excavation of the slug. All of the material was accepted by the sorter as containing radioactivity below the setpoint. Radiological analysis of the accepted material confirmed that it contained radium+thorium below the setpoint.

Based on these observations, the RSS can generally distinguish between uniformly contaminated soils containing radioactivity above and below the setpoint values of 24 pCi/g radium+thorium. A 4% false acceptance rate was observed in one instance. This setpoint value is significantly larger than any cleanup criteria proposed for the Maywood site. Performance of the RSS sorter should be expected to improve with increasing concentrations of uniformly distributed contamination.

4.4.1.2 Slug Test, Ra + Th Setpoint of 15 pCi/g

Two slugs, the “engineered slug” and the “onsite slug”, were processed using a setpoint of (approximately) 15 pCi/g for radium+thorium. The engineered slug consisted of equal volumes of contaminated soil and rock dust (see Section 4.2.1.3). The onsite slug was obtained from a stockpile of previously excavated soil at the Maywood site.

The engineered slug was processed using an exact setpoint of 13.75 pCi/g for radium+thorium. This value was calculated by using half of the setpoint (27.50 pCi/g radium+thorium) that the contaminated soil of the engineered slug was processed during the previous run. Radiological analysis of both the rejected and accepted material indicated that they both contained radionuclides in excess of the Ra+Th setpoint. The activity of the above-criteria pile was significantly higher than the activity of the below-criteria pile, indicating the RSS was distinguishing the slug materials, although not down to the setpoint level.

The onsite slug contained radium+thorium at approximately 12 pCi/g based on nine samples obtained prior to processing. All of the onsite slug was rejected as containing radioactivity in excess of the setpoint. Radiological analysis of the rejected material showed that it did not contain radioactivity in excess of the setpoint. Note that U-238 sorting was enabled for this test, and was disabled for subsequent tests until new software was implemented in October 2000.

The RSS did not efficiently or accurately sort mixed material at 15 pCi/g. Soil contaminated in excess of the setpoint was accepted by the sorter. Also, the sorter is subject to rejecting material that is not contaminated in excess of the setpoint. Performance was not reliable at the 15 pCi/g level of contamination.

4.4.1.3 Slug Test, Ra+Th setpoint of 10 pCi/g

One slug, slug 7-1, was processed at a setpoint of 10 pCi/g. This slug contained radium+thorium at approximately 25 pCi/g based on 9 in situ samples obtained prior to excavating the slug. Radioactivity was approximately equal in all nine samples. All soil in this slug was diverted to the above-criteria pile. Radiological analysis of the above-criteria pile confirmed that it contained activity in excess of the setpoint. Based on processing one slug at this setpoint, the RSS can detect and reject soil containing a constant and significant excess of radioactivity above this setpoint.

4.4.1.4 Slug Test, Ra+Th Setpoint of 5 pCi/g

The remaining eight slugs were processed using a setpoint of approximately 5 pCi/g radium+thorium. Of these slugs, 6-1 and 8-1 consistently contained radium+thorium activity greatly in excess of the setpoint. (Slug 8-1 had two in situ samples with activities near the setpoint and one sample with activities less than the setpoint. The average for the slug, however, was approximately 53 pCi/g. Individual and average activities measured for the processed material from this slug suggest that the three low in situ values were not representative of a significant portion of the total slug). These slugs were successfully rejected by the RSS. Radiological analysis of the rejected material confirmed that it contained radium+thorium consistently and significantly in excess of the setpoint.

Slug 8-2 contained radium+thorium at approximately 11 pCi/g. The radiological sorter successfully rejected 5.3 tons of the material comprising this slug. Radiological analysis of the rejected material confirmed that it contained radium+thorium in excess of the setpoint by a factor of approximately 2.

Slug 6-3 contained radium+thorium in a slight excess over the setpoint, approximately 7.5 pCi/g evenly distributed through the 9 samples obtained prior to excavating the slug. This slug was successfully rejected by the RSS. Radiological analysis of the rejected material confirmed that it contained radium+thorium in excess of the setpoint.

Slugs 7-2 and 7-3 contained very low concentrations of radium+thorium. While background radium and thorium activities are not yet known, these slugs were not dissimilar from typical background concentrations of these radionuclides. The RSS accepted these slugs as containing radium+thorium at concentrations below the setpoint. This was confirmed by radiological analysis of the accepted material.

Slugs 7-4 and 8-4 contained radium+thorium at concentrations close to the setpoint. For slug 7-4, the RSS accepted approximately 5 tons of material and rejected 12 tons. Radiological analysis of the accepted and rejected material showed that both contained radioactivity in excess of the setpoint. Slug 8-4 was accepted by the radiological soil sorter as containing radioactivity below the setpoint. Radiological analysis of the accepted material showed that it did contain radioactivity at levels less than the setpoint.

In conclusion, the Pilot Demonstration showed that material consistently contaminated with activity significantly well below or above the setpoint is successful rejected or accepted by the RSS. The sorter did not reliably discriminate between soils when the radioactivity content was near the setpoint. Note that U-238 activities were consistently lower than the U-238 setpoint, and therefore were not crucial to the selection process.

4.4.2 Batch Tests

Batches were typically larger volumes of soil than slugs. Batches were not characterized prior to processing. Analytical samples of processed material were obtained periodically (approximately every 50 cy per process stream). A variety of Ra + Th setpoints for rejecting soil as contaminated were used in the batch testing program as well as in the slug testing program. Results of the batch testing program are shown in **Table 17**.

Slugs with the same number as a batch compose a discrete subset of the same numbered batch. Some of the individual slugs do not have corresponding batches.

The physical extent of in situ material for individual batches was established by performing a surface gamma radiation survey prior to excavation. This survey was used to identify locations likely to contain desired levels and distributions of radioactivity for the individual batches. The results of these surveys are presented in Appendix C.

Batches were processed using a variety of Ra + Th setpoints. These setpoints and their associated batches are listed as follows:

- 5 pCi/g: 7,8,9,1-1, 8-1, 8-2, 6-1, 1-2, Sequence Batch 1, Sequence Batch 2, Sequence Batch 3, Sequence Batch 4, Sequence Batch 5, 7-4, 7-5, 7-6, 6-5, 6-6, and 6-7
- 15 pCi/: 1,2,3,4,5,6-1, 1-3, 1-4, 1-5, Batch Test 2 (17 pCi/g), 8-3, 6-6, 6-7, and 8-5
- 20 pCi/g: 7-1
- 32 pCi/g: 7-1, 8-3

Some of the batches, i.e., 6-7, 6-6, 8-3, and 6-1, were processed using more than one setpoint.

Individual batches were not sampled and analyzed prior to excavation and processing. As described previously and in Appendix C, walkover surveys were conducted to estimate the level and distribution of radionuclides in a batch prior to excavation. Some of the batches were composed of soils, whose average concentration were either all above or below the setpoint criteria. As was observed during slug processing, these batches were successfully processed and sorted into the appropriate stockpiles. Batches that contained material close to the setpoint criteria were less successfully sorted. This performance behavior is presented in detail in **Table 17**. Performance of the RSS was evaluated by comparing the laboratory values for the accepted and rejected material against the RSS setpoint value in use for each particular batch. Batch test laboratory radioisotope activities included natural background contributions estimated as in **Table 9**. The RSS operated using background subtraction techniques as described in Appendix B.

4.5 PERFORMANCE SUMMARY

The Pilot Demonstration evaluated both the RSS and GSS for their effectiveness to reduce the weight and volume of excavated soils that would require special handling management, and disposal as radioactive material. Weight and radioactivity tracking of individual process streams are presented in **Table 11** through **17**.

4.5.1 Gravel Separation

The GSS produced an oversize product (3/8 to 6 inch material) with an average radionuclide concentration of 5.60 pCi/g Th-232, 1.52 pCi/g Ra-226, and 2.81 pCi/g U-238 prior to rinsing to remove adhering fine material. The oversized fraction resulting from the GSS size separation has a lower activity level than the in situ soil, particularly with regard to Th-232. The reduction in Ra-226 and U-238 was marginal by comparison. For all the material processed, including the oversize, the average radioactivity content was 10.11 pCi/g Th-232, 2.07 pCi/g Ra-226, and 2.94 pCi/g U-238. The total oversize material (i.e., greater than 3/8 inch) comprised 34% of the material by weight. Of the total material, 32% was contained in the 3/8-inch to 6-inch fraction. The performance of the GSS with regard to both mass separation and radiological characteristics of the recovered oversize material is presented in **Table 14**. Separated gravel generally achieved total activity less than 15 pCi/g above background, although not in all cases. Gravel separation alone did not reliably achieve total activity less than 5 pCi/g above background.

Gravel separation, followed by rinsing to remove the associated fines, will produce a significantly cleaner product with regard to radioactivity. Based on radiological analysis of six batches of washed oversize material, operating the rinse unit resulted in an average decrease of 55% in Th-232, 33% in Ra-226, and 35% in U-238. Applied to the measured activity of the oversize prior to rinsing, a final washed gravel product with an average radionuclide concentration of approximately 2.52 pCi/g Th-232, 1.02 pCi/g Ra-226, and 1.83 pCi/g U-238. The activity in rinsed oversize material was reduced by up to 84% (**Table 15**). The quantity and size of fines associated with the oversize material from the SAA limited the use of the rinse unit during the Pilot Demonstration. Engineering modifications would be required to use this process during remediation. Additional evaluation of fines dewatering, management, and disposal would have to be performed to develop an estimate of the cost effectiveness of this technology. In most cases, gravel separation and rinsing produced a product with a total activity less than 5 pCi/g above background. However, additional data would be needed to demonstration this conclusively.

4.5.2 Radiological Sorting System

4.5.2.1 Volumetric Performance

The RSS divided the processed soils into two different stockpiles. One stockpile (Stockpile G) contained soil with radioactivity above the setpoint criteria as determined by the RSS. The other stockpile (Stockpile H) contained soil with radioactivity below the setpoint criteria as determined by the RSS. The relative amount of soil in each stockpile is a function of the radioactivity in the soil, the RSS setpoint, and the ability of the RSS to discriminate between accepted and rejected material.

As such, the performance of the Pilot Demonstration can provide guidance with regard to expected potential volume reduction, but it cannot be used to produce a reliable numerical estimate of the volume reduction that should be achieved in a full production operating mode. There are several reasons for this:

- The Pilot Demonstration was conducted using several different set points. In general the RSS is able to discriminate better at higher setpoints, especially if the feed material is significantly higher or lower than the setpoint value.
- Most of the Pilot Demonstration was conducted at a relatively low setpoint value compared to the anticipated standard of 15 pCi/g above background of Ra-226 + Th-232, and 50 pCi/g above background of U-238.
- The Pilot Demonstration soil was not necessarily similar in extent, distribution, or intensity of radioactivity compared with material to be processed during site remediation.

- The actual volume of below-criteria soil separated by the RSS cannot be greater than the amount of below-criterion soil fed through the system. In order to prevent acceptance errors (above-criteria soil erroneously directed to the below-criteria stockpile), a substantial amount of below-criteria soil will inevitably be lost to the above-criteria stockpile.

The entire batch processing effort generated 48% by weight accepted (i.e., below-criteria) soil. However, of this amount 32% consisted of acceptance errors. Most, but by no means all, of the acceptance errors were at low setpoints. Higher setpoints were generally used with selected higher-activity soils so observed error rates cannot be taken as representative of average system performance.

The acceptance error rate can be substantially lowered, if not eliminated, by artificially decreasing the setpoint below the enforceable cleanup standard. This will result in including some below-criteria soil with the above-criteria soil, but will minimize acceptance errors.

Eliminating the observed 32% error rate for the accepted soil results in a net volume reduction of approximately 33% of the RSS feed material. Approximately one third of the soil entering the RSS is expected to be accepted by the RSS as containing radioactivity below the setpoint confirmed by subsequent laboratory analysis.

4.5.2.2 Radiological Performance

The effectiveness of the RSS was inconsistent. Reviewing the slug data show that when the RSS was presented with material that was significantly and consistently above or below the selected rejection criteria, the system performed properly. Soil that is uniformly above the radioactivity criteria was identified as such and rejected. Soil that is uniformly below the radioactivity criteria was identified as such and accepted. The RSS did not perform reliably when presented with material that was not significantly and consistently above or below the acceptance criteria.

Tables 18 and **19** show the separation performance of the RSS for the slugs and batches. The reported quantities in these tables were determined by weighing the accepted and rejected material after processing. Sorting errors were identified by comparing the average radiological analysis values for the accepted or rejected materials to the criteria setpoints in use for a particular slug or batch. For the slugs, the RSS did not falsely reject any soil found by radiological analysis to be below criteria. There was a problem with false acceptance of material found by radiological analysis to be above criteria. A false acceptance rate of 18.4% by weight was found for the slugs.

The "Onsite" slug was rejected as containing radioactivity above the operating setpoint, 15 pCi/g radium+thorium, while radiochemical analysis of the rejected material showed an average radium+thorium activity of approximately 11 pCi/g. This erroneous rejection was not presented in **Table 18**, nor considered in the evaluation of the RSS.

The onsite slug was among the first materials processed during the Pilot Demonstration. The compensation software for uranium was not operating properly, and this resulted in the rejection of the slug material. If the uranium quantitation function of the RSS operated properly, this material probably would not have been rejected as containing radioactivity above the operating setpoint. Consequently, data from the onsite slug was not used further to evaluate the performance of the RSS.

Acceptance errors occurred in slugs 6-2, 7-4, and the engineered slug. In all three cases, the average radionuclide content of the accepted material was relatively close to the setpoint value. For example, for Slug 6-2, the falsely accepted material had a radium + thorium activity of 24.76 pCi/g versus a setpoint of 24 pCi/g. For slug 7-4, the falsely accepted material had a radium + thorium activity of 8.53 pCi/g versus a setpoint of 5 pCi/g. The engineered slug falsely accepted material that had a radium + thorium activity of 15.35 pCi/g versus a setpoint of 13.75 pCi/g.

The batches processed by the RSS were not characterized prior to processing, so the radiological characteristics of the accepted and rejected soil cannot be compared to a known preprocessing average soil activity. However, the radiological quality of the accepted and rejected soil can be compared to the processing criteria setpoint. Similar behavior was observed when a batch of soil was either entirely accepted or entirely rejected. The RSS generally identified and sorted correctly incoming soil that was entirely above or below criteria.

Batch processing performance was substantially less reliable in the case of mixed input soil, i.e., a batch of soil that contained material that was accepted and material that was rejected. The RSS produced a considerable number of errors based on radiological analysis of the accepted and rejected soil.

The majority of the material processed during the Pilot Demonstration, including both slugs and batches, used an operating setpoint of approximately 5 pCi/g radium+thorium. Most of the acceptance errors identified during the Pilot Demonstration also occurred at this setpoint. Another objective of the study was to determine the performance characteristics of the RSS at the so-called “industrial land use criteria”. These criteria were 15 pCi/g Ra-226 and Th-232 and 50 pCi/g uranium-238 (with a sum of ratios not to exceed one), commonly abbreviated as the 15/15/50 cleanup criteria.

RSS performance at these criteria appears on the surface to be more reliable. All of the batches processed at these criteria (30% by weight of the Pilot Demonstration), were successfully identified and sorted by the RSS. However, the performance diagnostic value of these data by themselves is somewhat limited in that most of this material was substantially above or below the 15 pCi/g radium+thorium setpoint. Where batch radioactivity was consistently above or below the operating setpoint, the RSS performed acceptably at all setpoint values tested during the Pilot Demonstration.

Only two slugs, the onsite slug and the engineered slug, were processed at 15 pCi/g. (The engineered slug was actually processed using a setpoint of 13.75 pCi/g). Of these, the onsite slug results are unsuitable for evaluation for reasons addressed previously in this section. The RSS did not successfully separate the engineered slug into above-criteria and below criteria components. Performance of the RSS for separating soils at the 15/15/50 cleanup level was not clearly demonstrated based on the Pilot Demonstration.

The excavation and management of soil from the five sequenced batches is described in Section 3.5 of this report. Sequenced batch tests were performed to minimize soil handling prior to processing through the GSS and RSS units to better preserve soil heterogeneity.

The results from Sequenced Batch 1 were promising. Approximately 40% of the batch was rejected. Subsequent radiological analysis of the rejected material showed radioactivity in excess of the setpoint criteria. The remainder of the batch was accepted by the RSS as containing radioactivity below the setpoint criteria. This too was confirmed by subsequent radiological analysis.

Approximately 40% of Sequenced Batch 2 was rejected by the RSS. Radiological analysis showed that the rejected soil contained radioactivity in excess of the setpoint criteria. However, the 60% of the batch accepted by the RSS as containing radioactivity below the setpoint criteria was found on subsequent radiological analysis to contain radioactivity above the setpoint criteria. In fact, the radioactivity of the accepted soil was essentially identical to the radioactivity of the rejected soil.

Sequenced Batch 4 was similar to Sequenced Batch 2. Rejected material (approximately 20%) was found to contain radioactivity in excess of the setpoint criteria. However, the remaining accepted material was also found to contain radioactivity in excess of the setpoint criteria.

Sequenced Batch 5 contained radioactivity well in excess of the setpoint criteria. All of this batch was successfully rejected by the RSS.

Performance of the RSS during batch processing was less accurate than the slug processing performance. Batch processing performance is indicative of the level of performance expected during full-scale operation. There were errors in the identification of both above criteria soils and below criteria soils. The error rate for false acceptance was considerably higher than for false rejection, 32% versus 8%. The error rate for false acceptance under batch processing conditions was higher than for slug processing. The difference between the measured radioactivity of falsely accepted material and the applicable setpoint was also greater for batch material than for the smaller, more manageable slugs.

The detection and data processing functions of the RSS are discussed in detail in previous sections of this chapter and in Appendix B. In addition to identifying and segregating above criteria soil, the RSS performs a continuing assay of the accepted and rejected soils based on the radioactivity measured by the detectors, the density of the soil, and the amount of material passing through the RSS. These computed values were found to be substantially different from the results of radiological analysis of samples from the same stockpiles. The differences were such, both in magnitude and direction, that a meaningful comparison proved difficult. The data are not presented in this report.

There are multiple potential causes for the identification and processing errors observed during the Pilot Demonstration. When operating within an optimal material input, the RSS is theoretically capable of successfully discriminating between above criteria soil and below criteria soil. The greatest source of sorting error was probably a result of the material itself and the extent of material handling that was performed. Successful operation of the RSS when both above criteria and below criteria material is present is based on having a fairly sharp physical boundary between contaminated soil and uncontaminated soil. (The absolute difference between the activity of the above criteria and below criteria soil was also critical to successful sorting). This boundary was substantially lost during soil processing prior to passing through the RSS. The operation of the GSS had the most effect on mixing the feed soils and degrading the boundary between above and below criteria soils. This was shown by the absence of improved performance during processing of the sequenced batches.

The soil from the SAA contained a wide range of particle sizes and types. The RSS was provided a fairly uniform feed of 3/8-inch or smaller material to produce an even layer of soil passing under the detectors. This required that the soil from the SAA be passed through a grizzly and a vibratory GSS before delivery to the RSS. Each of these processes results in mixing and homogenizing the soil, particularly the vibratory GSS. As a result of these necessary soil handling processes upstream of the RSS, the boundary between contaminated soils and uncontaminated soils in the same batch is compromised or even lost. Without clear boundaries to define contaminated portions of the soil stream passing through the RSS, performance of the system is inevitably degraded regardless of the systems inherent capabilities. The degraded performance of the RSS during the Pilot Demonstration is certainly due in part (and perhaps in large part) to the necessarily vigorous physical processing of the soil prior to sorting by the RSS.

5.0 ENVIRONMENTAL CONSIDERATIONS

5.1 DUST

Total aerosol monitoring, or "dust monitoring," was conducted in and around different work areas of the Pilot Demonstration over a period of three months, from August 17, 2000 to November 8, 2000. Dust monitoring was conducted at the Pilot Plant RMA and the SAA. The monitors were placed downwind from soil processing activities at the RMA boundary and on the perimeter of the SAA. They were operated in a continuous datalogging mode. Monitors were also placed in the work areas that had the potential to generate dust, such as the GSS vibrating screens and the RSS platform.

TSI DustTrak® Model 8520 aerosol monitors were used during the daily monitoring periods. The DustTrak is a portable, laser photometer that measures and records real time airborne dust concentrations while data is simultaneously logged into memory. This instrument measures particles in the size range 0.01 to 10 microns and a mass concentration ranging from 0.001 to 100 micrograms per cubic meter ($\mu g/m^3$). Results from dust monitoring conditions are presented in Appendix I.

The FMSS Site Safety and Health Plan (SSHP), Section 8.1.1, requires work stoppage when work site dust levels reach 4 milligram per cubic meter (mg/m^3), during activities that disturb the soil, such as excavation, removal, separation, etc. This limit was never reached during the Pilot Demonstration. Doses to workers working on the Pilot Demonstration were less than 100 mrem Total Effective Does Equivalent (TEDE) for the duration of the Pilot Demonstration.

The SSHP also requires a personnel protection equipment (PPE) upgrade to respiratory protection whenever dust levels reach 1 mg/m^3 in the work area during activities that disturb the soil. This action level was exceeded on two separate occasions:

- On August 17, 2000, an instrument anomaly of 1.25 mg/m^3 was recorded in the general work area that lasted approximately 1 minute. Dust levels returned to an acceptable range for the remainder of the workday.
- On November 2, 2000, a level of 1.013 mg/m^3 was recorded in the manlift operating area near the GSS vibrating screens. Levels returned to an acceptable range after less than 5 minutes and remained as such for the remainder of the day.

Respiratory protection was not warranted on these two occasions since these slightly elevated dust levels lasted for a brief period. In addition, the project team was immediately notified of the elevated levels and responded by applying dust control practices to suppress the levels.

The FMSS SSHP, Sections 8.1.1 and 8.1.4 also identify a site perimeter peak limit of 0.05 mg/m^3. This is a derived value used to limit offsite exposures of Th-232 to 10 millirem per year (mrem/y). On four separate occasions in September 2000, this limit was exceeded:

- Three of the four limit situations were attributed to weather interference (i.e., fog, haze, and rain) with the dust monitoring equipment.
- The fourth instance occurred on September 20, 2000. On this date, dust levels at the SAA and Pilot RMA reached 0.066 mg/m^3. Weather conditions were clear and fair during this monitoring period. The elevated levels were attributed to inadequate dust control measures being employed in these areas. In response, corrective actions were implemented and the dust levels dropped below action levels.

Except for the instances identified previously, dust levels remained below established limits throughout the Pilot Demonstration. This was accomplished through aggressive use of dust control techniques including sprayers built into the pilot plant systems, fire hoses operated by the labor force, and a water truck spraying the grounds and driving surfaces. When applied conscientiously, these measures proved adequate for controlling airborne dust concentrations with minimal impact on plant operations. The maximum Annual Effective Does Equivalent to an individual in the public due to Pilot Demonstration related work is 5.6 E-4 mrem/year (USACE, 2000b).

5.2 NOISE

The operation of the Pilot Demonstration facility had the potential for increasing the ambient sound levels in the area. In order to assess this impact, sound level surveys were conducted before and during the facility operation. The first survey took place in February 2000, primarily on West Central Avenue adjacent to the FMSS, prior to site operations. Further measurements were taken in October and November 2000 during the Pilot Demonstration program. The data from the two surveys were compared to quantify the noise impact of the soil processing equipment. The results of the second survey are tabulated in Appendix J, and both surveys are summarized in **Table 20**.

Two different measures of sound level were used: the L_{90} and the L_{eq}. The L_{90} is the ambient level exceeded 90% of the time. It is often referred to as the background sound level. It is representative of the quiet periods between transient sounds, such as passing cars. Any new noise source introduced into the sampling area would be most audible during the quiet periods quantified by the L_{90}.

The L_{eq} is the energy average sound level. It is generally used to measure variable vehicular sound from construction sites, highways and aircraft. Since the L_{eq} represents the energy average of all intrusive sound, and the L_{90} level represents the quite periods in the absence of intrusive noise, the L_{90} level is always less than the $L_{eq.}$ Both the L_{90} and L_{eq} were simultaneously measured during the 10-minute sampling periods at the locations shown on **Figure 5**.

A Quest Model Q-200 Type 2 Noise Dosimeter was used to conduct the survey. The instrument was set to a 3 decibel (dB) exchange rate for calculating L_{eq}s, and was calibrated before and after each use as specified by the manufacturer.

The sound levels were measured in the following locations:

- Location 1: Sidewalk at corner of Eccleston Place and West Magnolia Ave.
- Location 2: Sidewalks on the North side of West Central Ave., halfway between Ramapo Ave. and Eccleston Place.
- Location 3: Sidewalk on the North side of West Central Avenue, halfway between Eccleston Place, and Hergesell Avenue.
- Location 4: Sidewalk North of West Central Avenue, halfway between Hergesell Avenue and NJ State Rt. 17.

5.2.1 Results

The sound level survey measurements are summarized in **Table 20** and tabulated in Appendix J. All sound levels were measured between 11:00 a.m. and 2:00 p.m. during continuous operation of the rinse unit. Only eight survey samples were obtained due to the variability of the rinse unit run times during the Pilot Demonstration process.

Front-end loaders were used to transfer soil / material from the SAA to the Pilot Plant screening, rinsing and segregating units. The equipment's backup alarms and diesel engines were clearly audible at the survey locations on West Central Avenue, as were the gravel rinsing vibrating screens. The rinse unit was the loudest when materials were being added to the screening process.

The facility operation was "just audible", "plainly audible", and "dominate" at Locations 2, 3, and 4 respectively. The operational sound was distinguishable from background levels as high as 69 dBA. The L_{90} background sound levels during facility operations were from 2 to 5 dBA higher than those measured during the pre-operation survey. The L_{eq} levels ranged up to 9 dBA higher than the pre-operational levels. The highest L_{eqs} were at Location 2 and ranged from 71 to 73 dBA.

5.2.2 Conclusions

The L_{eq} levels measured at Location 2, ranged from 71 to 73 dBA. These levels indicated that sound from the operation of the Pilot Demonstration Rinse Unit will exceed the NJ Noise Ordinance (N.J.A.C. 7:79) of 65 dBA for the township of Maywood, and noise code limit of 60 dBA for the township of Rochelle Park, during daytime hours.

A further detailed study of the Pilot Demonstration units will need to be conducted to determine noise source impacts, and, as necessary, abatement methods that would reduce the gravel rinse unit's noise impact on the local community.

5.3 CHEMICAL

Material processed through the Pilot Demonstration systems was analyzed to determine if chemical constituents tended to concentrate in any one fraction during processing. In situ material was sampled and analyzed for chemical characteristics, as was the total greater than 3/8-inch fraction and the total less than 3/8-inch fraction material. Accepted and rejected material from the RSS was also characterized to determine if any chemicals were preferentially associated with the radioactive constituents. Fines removed by the rinse unit were analyzed to determine if any chemicals were preferentially associated with the fines compared to the coarser materials.

Wipe samples were collected of the greater than 6-inch material. Each wipe sample was collected over 1/8 of a rock surface; therefore, each analytical result was multiplied by eight to make it representative of the entire rock surface. All units were then converted to milligrams (mg). The average mass of a rock in the greater than 6-inch material was 13.18 kilograms. This average mass was obtained by assuming an average rock diameter and density of 8 inches and 3 g/cm^3, respectively. Each sample result was then divided by this mass to get a concentration in units of mg/kg. This also assumes that there are no target analytes present inside the rock. These concentrations were then compared to cleanup action levels in order to evaluate options for disposition of this stockpile.

A summary of chemical results is presented in **Table 21**. For each analyte, only samples that had detectable concentrations were considered. The average concentration and standard deviation were calculated for each analyte at each stockpile. Next, the average concentrations (in mg/kg) were graphed for specific analytes that best represent a broad range of concentrations and differences in variability in the process system. The following analytes were selected: aroclor-1254, aroclor-1260, lead, molybdenum, manganese, dieldrin, 4,4'-DDE, toluene, pyrene, benzene, benzo(a)anthracene, and reactive sulfide. These bar graphs are presented in Appendix K.

Where available, in situ data and data for stockpiles I ("filter cake" fines), F (total less than 3/8 inch), J (total greater than 3/8 inch), E (greater than 6 inch), G (radiologically rejected less than 3/8 inch), and H (radiologically accepted less than 3/8 inch) were graphed. In reviewing these data, it does not appear that the chemicals were concentrated during radiological sorting. There was also no clear trend visible for a differential distribution of chemical constituents with regard to particle size. None of the average chemical constituent concentrations exceeded any New Jersey direct contact concentration limit for either industrial or residential land use. None of the analyses indicated that the soil might constitute a hazardous waste.

6.0 TREATMENT SYSTEM COST ANALYSIS

A primary objective of the Pilot Demonstration was to gain a better understanding of the costs and benefits of volume reduction technologies on the overall remediation of the FMSS. This section builds on the cost model developed in the Technology Evaluation Report. Operational experience gained during the Pilot Demonstration is incorporated into site-specific unit costs for key cost elements of the model. Different remediation scenarios are then evaluated to develop an understanding of the FMSS remediation cost sensitivity to potential program constraints and site-specific conditions. Factors affecting system performance and efficacy with respect to remediation of the entire FMSS are discussed below. Supporting calculations are presented in Appendix L.

6.1 ECONOMIC MODEL

The economics of processing material is a function of the volume of the material, processing costs, disposal costs, and cost credits. The objective of the selected technologies is to remove material that is below the cleanup criteria and minimize the volume of material requiring off-site disposal. Accordingly, costs are most sensitive to changes in volume and, within certain limits, costs are directly proportional to the volume of soil processed and the volume of clean soil recovered. In order to facilitate direct comparison of alternatives, the cost model was developed to calculate the total unit cost per cy of soil remediated. The cost model is summarized as follows:

$$\textit{Total Unit Cost} = \frac{\textit{Process Cost + Rad Disposal Cost + Alternative Disposal Cost – Backfill Credit}}{\textit{Total Construction Volume}}$$

Each cost factor in the model is expressed mathematically as follows:

$$\text{Process Cost} = (100 - a) \times V \times P$$
$$\text{Rad Disposal} = [a + (100 - a)(100 - R)] \times V \times D_r$$
$$\text{Alternative Disposal} = (100 - r)[(100 - a) \times R \times V] \times D_a$$
$$\text{Backfill Credit} = r \times [(100 - a) \times R \times V] \times B_c$$

Where:

- V = total construction volume
- a = percent of soil that can not be processed
- R = percent of soil recovered as below criteria
- r = percent of recovered soil that can be reused onsite
- P = process cost per cy
- D_r = disposal cost per cy for radiologically-contaminated soil
- D_a = disposal cost per cy for non-radiologically-contaminated soil
- B_c = credit per cy on backfill for volume of soil reused onsite

6.2 KEY COST FACTORS

Key cost factors in the economic model include the rate and cost of processing, transportation and disposal costs, and backfill credit for below criteria soil that is recovered and can be reused onsite. The total cost of soil processing is ultimately a function of soil volume: the volume of soil excavated, the volume of excavated soil that can be processed, and the volume of soil recovered as below cleanup criteria. Each of these cost factors is discussed below.

6.2.1 Processing Costs

The Pilot Demonstration included soil acquisition since there was no active remediation to provide a feed source to the system. Since soil acquisition costs are required under either a strict “excavate and dispose” scenario or a “soil processing” scenario, excavation and soil transport to the MISS costs are not considered in this analysis. Processing costs include only the costs that would not otherwise be incurred under the “excavate and disposal” scenario. Three areas of cost unique to the processing scenario were considered: process management, gravel separation, and radiological sorting. These costs are presented in detail in Appendix L and are summarized below.

All the processing costs assume continuous operations. Budgetary constraints, access to vicinity properties, and unprocessible soils could result in process interruptions. This would have the effect of reducing operational effectiveness and could increase the processing costs of any or all of the various components. For example, an operator running the gravel rinse system may not be able to be integrated into construction activities if there was not material available to support process operations. The alternative is to operate the system at a lower throughput rate or demobilize the system operators. In either case, the unit cost of processing would be increased. This cost uncertainty is discussed in greater detail in subsequent sections.

6.2.1.1 Process Management

Process management includes task management, radiological, health and safety oversight, and materials management. Task Management time is required to coordinate process operations with other site operations, direct construction superintendents, and subcontract management. A field construction superintendent oversees the daily operations and directs craft labor. A sample technician is responsible for collection and management of soil and water samples and ensuring results are received in a timely manner from the laboratory. A QC Inspector will review operations and ensure that all applicable standards and procedures are being implemented. In addition, the QC Inspector prepares a daily QC Report for the USACE. Two operators and loaders accomplish material management. They are responsible for feeding material into the system and managing the “above” and “below” criteria material piles. The estimated daily cost for process management, radiological, health and safety oversight, and material management is $3,600.

6.2.1.2 Gravel Separation System

The GSS involves the physical separation of material greater than 3/8 inch through a series of screens and vibrators. The coarse fraction or “overs” are then conveyed to a rinse system to remove any fine particles that might have adhered to the coarse fraction. The system requires an operator to run the screening system. In addition, three laborers are needed to support the operation and maintenance of the two systems and the connecting conveyor belts.

A second operator is required for the gravel rinse system. Although there is an on-site water treatment plant for pre-treatment of construction water, the gravel rinse system needs to be a stand-alone system. The gravel rinse system is a closed-loop system. Water is recycled through a treatment system to minimize makeup water useage. As a result, water disposal is minimal due to process losses. Fines that are removed would be disposed as radiological waste material. The estimated daily cost to operate the GSS is $5,600. The equipment was already capitalized during the Pilot Demonstration and is not include in the analysis.

The daily production capacity is a function of process rate and equipment availability. The maximum process rate experienced during Pilot Demonstration however was 160 tons per hour or 125 cy per hour. This rate was used for evaluation purposes.

The actual available production time for the GSS experienced during the Pilot Demonstration was 6 hours based on a 10-hour day. The difference accounts for safety briefings, dress-in/out of the radiation control area and breaks, and an average of 1.24 hours per day of equipment downtime for nontest-related equipment problems and required maintenance. Based on maximum production rates and daily equipment availability experienced during the Pilot Demonstration Project, the GSS has the capacity to process on estimated 750 cy of soil per day.

The GSS would not be used to process all types of material anticipated during remediation. This is due to material characteristics that would not yield desired results. Material characteristics that would prevent processing include pond material that liquified when vibrated by the GSS, organic material from the wetlands, saturated clays, silts and sands deposits with little or no coarse fraction, and chemically contaminated soil. As the percentage of material that is not processed increases, the overall construction volume must increase in order to keep the GSS operating at optimum capacity. Unused capacity results in a higher unit process cost for the GSS.

6.2.1.3 Radiological Sorting System

The GSS system conveyed less than 3/8-inch soil directly to the feed hopper on the RSS. The RSS screeds the soil to a uniform thickness and width on a horizontal conveyor belt prior to passing below the radiological detectors. Per the equipment manufacturer, the RSS requires five staff onsite: one supervisor, two system operators, and two craft operators. The total daily operating cost for the RSS is dependent on the overall duration of operations. The analysis assumes that capital cost for the RSS is recovered over the project duration; the annual capital recovery of the RSS decreases as the duration increases. Additional personnel mobilization costs are also incurred for each construction season. Assuming construction over a 7-year period, the daily operating cost for the RSS is approximately $7,000. The limited commercial availability of equipment and trained operators reduces the ability to attain more competitive pricing.

The process rate of the RSS is determined by the belt speed and width. The RSS conveyor belt operates at a constant speed. The RSS used during Pilot Demonstration was capable of 25 cy per hour. Under full-scale operations, a wider belt would be specified to enable a process rate of 50 cy per hour.

As with the GSS, daily production is also dependent on equipment availability. The actual available production time for the RSS experienced during the Pilot Demonstration was 6.5 hours based on a 10-hour day. The difference accounts for safety briefings, dress-in/out and breaks, and an average of 0.43 hours per day of equipment downtime for non-test-related failures and maintenance. Based on maximum production rates and daily equipment availability, it is estimated that the RSS has the capacity to process estimated 325 cy of soil per day.

The RSS has similar limitations on the material suitable for processing as the GSS. The pond material could not be processed. Homogeneously contaminated radiological material that is clearly above criteria would also not be processed.

6.2.2 Transportation & Disposal Costs

The cost of disposal is largely dictated by market conditions. Market competition might secure more competitive rates for transportation and disposal of contaminated soil from the FMSS. The current analysis utilizes the best pricing currently available to the project.

Two disposal scenarios are considered in the evaluation. The first scenario is for highly active radiologically-impacted soil. Under this scenario, it is assumed that soils are transported and disposed of at a licensed, “11(e)2” disposal facility. The model uses rail transportation costs developed under open commercial competition. The disposal cost is based on pricing under an existing government contract. In addition, costs for loading railcars were included. The current unit cost for loading railcars, rail transportation, and disposal at an “11(e)2” facility under this scenario is \$233 per cy. This cost is expected to come down as a result of competitive procurement of combined transportation and disposal services.

An alternative disposal scenario considered material that contains less radioactivity and/or has chemical contamination. This scenario would involve soils that are below the radiological cleanup criteria but are determined unsuitable for onsite reuse. The same rail transportation cost was used as above but disposal was assumed at the Envirosafe landfill in Idaho. Unit prices from the existing government contract were used. The unit cost for loading railcars, rail transportation, and disposal under this scenario is \$203 per cy.

Disposal at a local Subtitle “D” was considered; however, no landfills were identified that were willing to accept waste containing residual radioactive contamination. A Subtitle “D” waste stream is anticipated during remediation. This waste stream would be comprised of construction debris that is not contaminated (e.g., surface pavements). This debris waste stream is not included in the volumes used in this analysis.

6.2.3 Backfill Credit

A credit is realized for every cy of “below criteria” soil that is recovered and can be reused onsite. The backfill credit is dependent on the volume of “below criteria” material recovered and whether the properties of the recovered soil are suitable for backfill. The suitability of the recovered backfill includes meeting New Jersey standards and definitions of “clean” backfill and permeability characteristics. There is a cost associated with this determination and involves the analysis of samples for radiological and chemical parameters. The actual number of confirmation samples required by the regulators in not known. It was assumed that one sample for every 100 cy of “below criteria” soil is required to demonstrate conformance to applicable standards. Additional samples would be required to meet quality control objectives. The cost of this analysis reduces the backfill credit realized since it adds a cost to the recovered material.

It is assumed reuse would only occur on the government property or limited portions of Stepan or Sears properties. This minimizes additional costs associated with transporting the soil to the backfill area. The backfill credit is based on the cost to purchase backfill and associated conformance testing minus the testing costs associated with demonstrating the recovered material meets chemical parameters. The net credit was determined to be \$1.02 per cy (see Appendix L for additional cost detail). This credit assumes that the combination of recovered soils (fine and coarse fractions) are sufficient to meet the physical characteristics for backfill.

6.2.4 Volume

As shown in the cost model, key cost factors are a function of volume. The model considers several different volumes: the total construction volume, the processible volume, the volume of coarse fraction (greater than 3/8 inch), the recovered “below criteria” volume, and the reuse volume. Most of these volumes are expressed as percentages of the total volume since experience has shown actual volumes may vary from estimated volumes. For the purpose of this analysis, the total volume (345,896 cy) was derived from Stone & Webster Calculation 0402-030 (Appendix L) by applying a 30% bulking factor. Similarly, the initial cost analysis assumed a 30% coarse fraction for all material processed during the Pilot Demonstration based upon actual results of 31.85%. A subsequent cost analysis is presented using a 15% coarse fraction as estimated in the Engineering Test Pit Report (USACE, 1999c).

The volume of material that is not suitable for processing was considered a variable in the analysis. The Pilot Demonstration verified that the system has limitations on the types of soil that are acceptable. The pond material was determined to fall into this category. The volume of pond material has been estimated to be approximately on the order of 75,000 cy. There is some concern this volume may increase since a significant amount of pond material was encountered in the SAA that was not previously identified. Contaminated debris (e.g., buried drums), chemically contaminated soil, and saturated soils also fall into the category of unacceptable soil for processing. In addition, soil that is homogeneously contaminated with radiological waste above the criteria would not be processed by the RSS. The volume of this category of soil is estimate to range from 40 to 70% of the overall volume of soil identified for remediation. The percentage is towards 70% for the RSS and 40% for the GSS since the GSS is not sensitive to homogeneous contaminated soil.

The volume of material that is not suitable for processing has significant implications to the operational efficiency of the system. As discussed under processing costs, as the volume of material suitable for processing is reduced the unit cost for processing goes up since daily processing costs are generally considered fixed. The ability to stockpile material to optimize equipment utilization during process operations is limited at the Maywood Site. Other site infrastructure including the process plant itself will not accommodate the large stockpiles that would be required. In addition, agreements with the local community limit stockpiles to 1,000 cy.

The recovery of below criteria material is dependent upon system performance. The volume recovery from the GSS is assumed equal to the coarse fraction. The volumetric reduction from the RSS was discussed in Section 4.5.2.1. Volume reduction is highly dependent upon the characteristics of the feed material and the selected criteria. The volume recovery from the RSS is assumed to equal 32% of the entire volume of the fine fraction. This number is assumed to be a maximum volume recovery and assumes that the feed soils are heterogeneously contaminated and the level of activity is close the acceptance criteria. It is assumed that below criteria material that is not suitable for reuse (i.e., does not pass chemical testing) is disposed at an alternative landfill (Envirosafe).

6.3 ALTERNATIVE COMPARISON

Two alternatives are evaluated:

1. The Base Case is defined as the “excavate and disposal” alternative. Under this alternative, standard construction methods are employed to remove radiologically-impacted soil above criteria. The material is brought back to the government property where it is transported and disposed of as radiologically-impacted soil at $233 per cy.

2. The second alternative is the Process Case. Under the Process Alternative, the same procedure is followed with respect to excavation. The difference is that the material is run through the GSS/RSS process prior to disposal. Since the cost of excavation is equal in both cases, these costs are excluded from the analysis.

The unit cost sensitivity to the volume of material that is not suitable for processing and the volume of “clean” soil that is reused onsite is presented in **Exhibit 1** and is shown graphically on **Exhibit 2**. This analysis demonstrates the sensitivity of the Unit Cost for the Processing Case to changes in the volume of unprocessible soil and the volume of soil reused. In this analysis, the construction rate is fixed and is assumed to equal the optimum process rate of the system [RSS daily rate (100 + percent coarse fraction)]. The analysis also assumes that the recovery from the RSS is fixed at 32% of the less than 3/8-inch material (fines). All material that is not suitable for processing or reuse is disposed of as radiologically contaminated. The shaded area on **Exhibit 2** bounds the range of unprocessible soils that are anticipated. The analysis indicates that when unprocessible soil volume exceeds 50% of the total volume process costs exceed the base case (excavate and dispose option). Under a fixed construction rate, process costs become favorable when all recovered material is suitable for reuse and the percent of unprocessible soils are less than 50%.

Given unlimited resources, no operational conflicts, and no fiscal budgetary constraints, construction rates would equal the maximum processing rate of the system. Under this condition, capital equipment is fully employed, and processing costs per yard of soil are minimized. If construction is limited by funding or property access, the potential exists for underutilization of the process capacity. Underutilization of process capacity can also exist when the construction rate is not sufficient to supply the system with processible soil at the process capacity.

Exhibits 3 and 4 examine the sensitivity of the construction rate on unit processing costs. In this analysis, the construction rate is the key variable. Reuse is assumed fixed at 100%, and the volume of unprocessible soil is bounded by 40 and 70% of the total construction volume. The Total Unit Cost declines as the construction rate increases until the daily construction volume minus the volume of unprocessible soil is equal to the optimum process rate. The analysis shows that unit process costs decline as the construction rate increases. Construction rates would have to exceed 600 cy per day to have a favorable unit cost over the base case when unprocessible soils equal 70%. Unit costs are more favorable as the percent of unprocessible soils decrease. When unprocessible soil equals 40%, the unit costs for the process scenario are all less than the base case.

Given questionable performance results of the RSS on the soils found at the Maywood Superfund Site, a derivation of the Process Case involving a "GSS-only" operation was evaluated. The unit cost analysis for this case is shown on **Exhibits 5 and 6** using the same assumptions as for the combined GSS/RSS case. In this GSS-only case, the unit processing cost is reduced however no volume recovery is realized on the less than 3/8-inch fraction. The analysis is similar to the analysis combine process case. There is a slight improvement in cost performance but the analysis still indicates the need for 100% reuse and unprocessible soil volume of less than 50% to have favorable cost performance over the base case.

The unit cost sensitivity to construction rate of the "GSS-only" scenario is shown on **Exhibits 7 and 8.** Assuming a 100% reuse of the coarse fraction, the GSS indicates the potential to lower total unit costs per cy. The results are similar to the combined GSS/RSS case; unit costs decrease as the construction rate increases towards the optimum system rate (750 cy per day for the GSS). Since the GSS is less sensitive to homogeneously contaminated soil, a higher volume of processible soil is expected for the GSS system alone.

The percent coarse fraction recovery during the Pilot Demonstration was around 30%. The Engineering Test Pit evaluation of the overall site soils found the coarse fraction was only 15%. To determine the cost implications of the uncertainty of the percent of coarse fraction, additional analyses were completed at the lower coarse fraction level (15%). **Exhibits 9 and 10** were run at a fixed construction rate and **Exhibits 11 and 12** were run at varying construction rates. At the projected volume of the coarse fraction for the Maywood Site soils and construction rate, the GSS-only process does not have favorable cost performance. In order for the GSS-only system to have favorable cost performance would require less than expected percentage of unprocessible soil and higher than expected daily construction rates.

Exhibit 1 – Unit Cost Analysis – GSS & RSS Processing Construction Constrained – 400 cy/d

Given: GSS & RSS Processing
390 cy/day system capacity
50,000 cy/season max
400 construction rate

Assume:

V = 345,896 cy — Fixed for all cases
P = dependant on construction duration and soil throughput
D_r = \$233 per cy — Fixed
D_a = \$203 per cy — Fixed
B_c = \$1.02 per cy — Fixed
R = 52% of volume recovered as below criteria
Assume all coarse fraction is recoverable — Coarse Fraction = 30% by volume
Percent of remaining fines that are recoverable — Fines Fraction = 32% by volume

a % Unprocessible	r % Reuse	P	Process Factor	Rad Disposal	Alt Disposal	Backfill Credit	Unit Cost	Base
30%	100%	\$ 58	\$ 14,043,373	\$ 51,033,729	\$ -	\$ 129,598	\$ 188	\$ 233
40%	100%	\$ 67	\$ 13,905,014	\$ 55,256,988	\$ -	\$ 111,084	\$ 200	\$ 233
50%	100%	\$ 81	\$ 14,008,783	\$ 59,480,247	\$ -	\$ 92,570	\$ 212	\$ 233
60%	100%	\$ 101	\$ 13,974,193	\$ 63,703,506	\$ -	\$ 74,056	\$ 224	\$ 233
70%	100%	\$ 134	\$ 13,905,014	\$ 67,926,764	\$ -	\$ 55,542	\$ 236	\$ 233
30%	50%	\$ 58	\$ 14,043,373	\$ 51,033,729	\$ 12,878,286	\$ 64,799	\$ 225	\$ 233
40%	50%	\$ 67	\$ 13,905,014	\$ 55,256,988	\$ 11,038,531	\$ 55,542	\$ 232	\$ 233
50%	50%	\$ 81	\$ 14,008,783	\$ 59,480,247	\$ 9,198,776	\$ 46,285	\$ 239	\$ 233
60%	50%	\$ 101	\$ 13,974,193	\$ 63,703,506	\$ 7,359,021	\$ 37,028	\$ 246	\$ 233
70%	50%	\$ 134	\$ 13,905,014	\$ 67,926,764	\$ 5,519,266	\$ 27,771	\$ 252	\$ 233

V = total construction volume
P = process cost per cy
D_r = disposal cost per cy for radiologically-contaminated soil
D_a = disposal cost per cy for non-radiologically-contaminated soil
B_c = credit per cy on backfill for volume of soil reused onsite
R = percent of soil recovered as below criteria

Exhibit 2 – Unit Cost Analysis – GSS & RSS Processing Construction Constrained – 400 cy/d

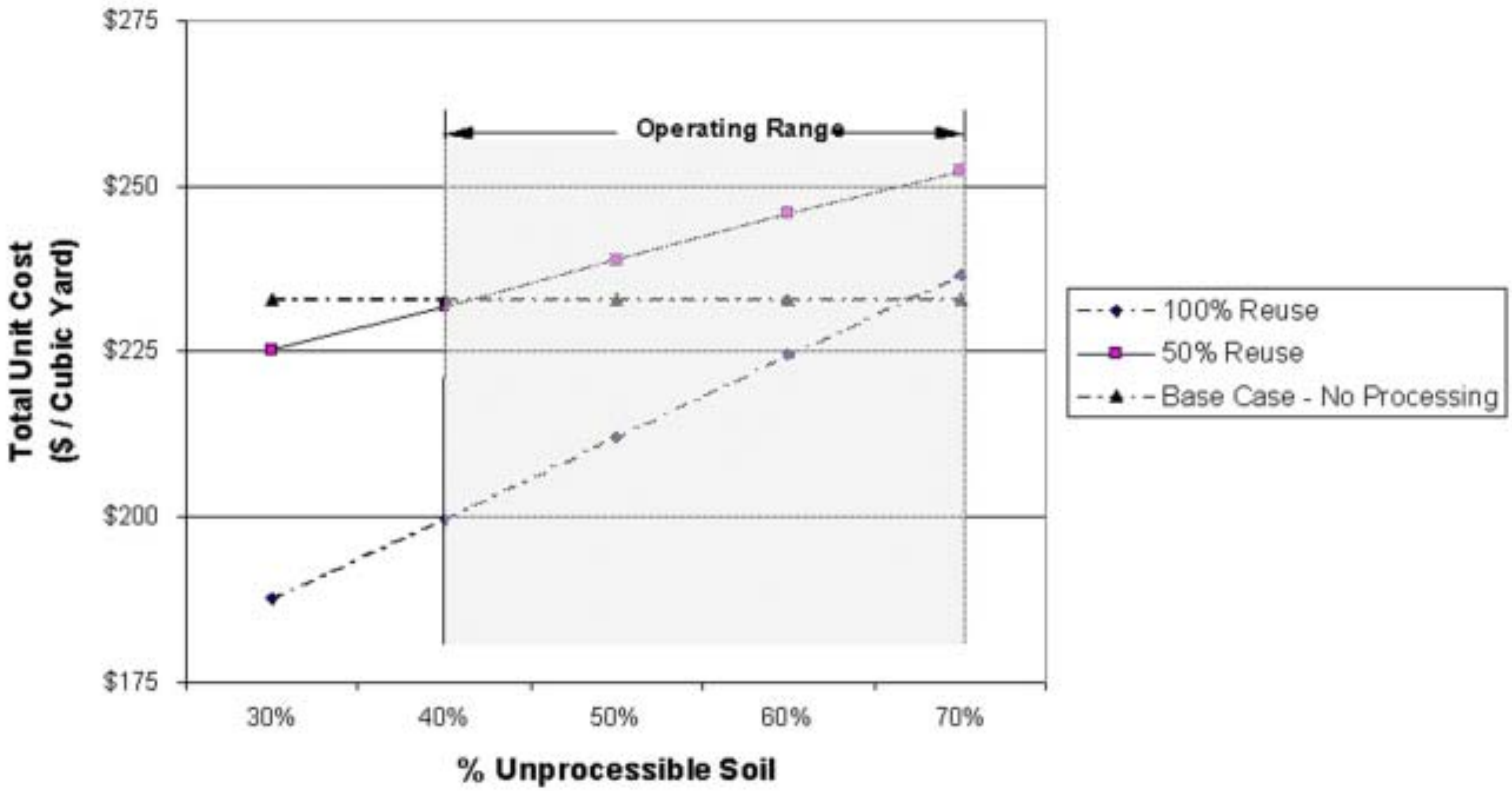


Exhibit 3 – Unit Cost Sensitivity – GSS & RSS Processing – Varying Construction Rate

Given: GSS & RSS Processing
390 cy/day system capacity
50,000 cy/season max
100 Reuse

Assume:

V =	345,896 cy	Fixed for all cases		
P =		dependant on construction duration and soil throughput		
D_r =	$233 per cy	Fixed		
D_a =	$203 per cy	Fixed		
B_c =	$1.02 per cy	Fixed		
R =	52%	Fixed	Coarse Fraction =	30%
			Fines Fraction =	32%
r =	100%			

a % Unprocessible	Construction Rate	P	Process Factor	Rad Disposal	Alt Disposal	Backfill Credit	Unit Cost	Base
40%	300	$ 89	$ 18,470,840	$ 55,256,988	$ -	$ 111,084	$ 213	$ 233
40%	400	$ 67	$ 13,905,014	$ 55,256,988	$ -	$ 111,084	$ 200	$ 233
40%	500	$ 54	$ 11,207,026	$ 55,256,988	$ -	$ 111,084	$ 192	$ 233
40%	600	$ 45	$ 9,339,189	$ 55,256,988	$ -	$ 111,084	$ 186	$ 233
40%	700	$ 38	$ 7,886,426	$ 55,256,988	$ -	$ 111,084	$ 182	$ 233
70%	300	$ 179	$ 18,574,608	$ 67,926,764	$ -	$ 55,542	$ 250	$ 233
70%	400	$ 134	$ 13,905,014	$ 67,926,764	$ -	$ 55,542	$ 236	$ 233
70%	500	$ 107	$ 11,103,258	$ 67,926,764	$ -	$ 55,542	$ 228	$ 233
70%	600	$ 89	$ 9,235,420	$ 67,926,764	$ -	$ 55,542	$ 223	$ 233
70%	700	$ 77	$ 7,990,195	$ 67,926,764	$ -	$ 55,542	$ 219	$ 233

V = total construction volume
P = process cost per cy
D_r = disposal cost per cy for radiologically-contaminated soil
D_a = disposal cost per cy for non-radiologically-contaminated soil
B_c = credit per cy on backfill for volume of soil reused onsite
R = percent of soil recovered as below criteria
r = percent of recovered soil that can be reused onsite

Exhibit 4 – Unit Cost Sensitivity – GSS & RSS Processing (100% Reuse)

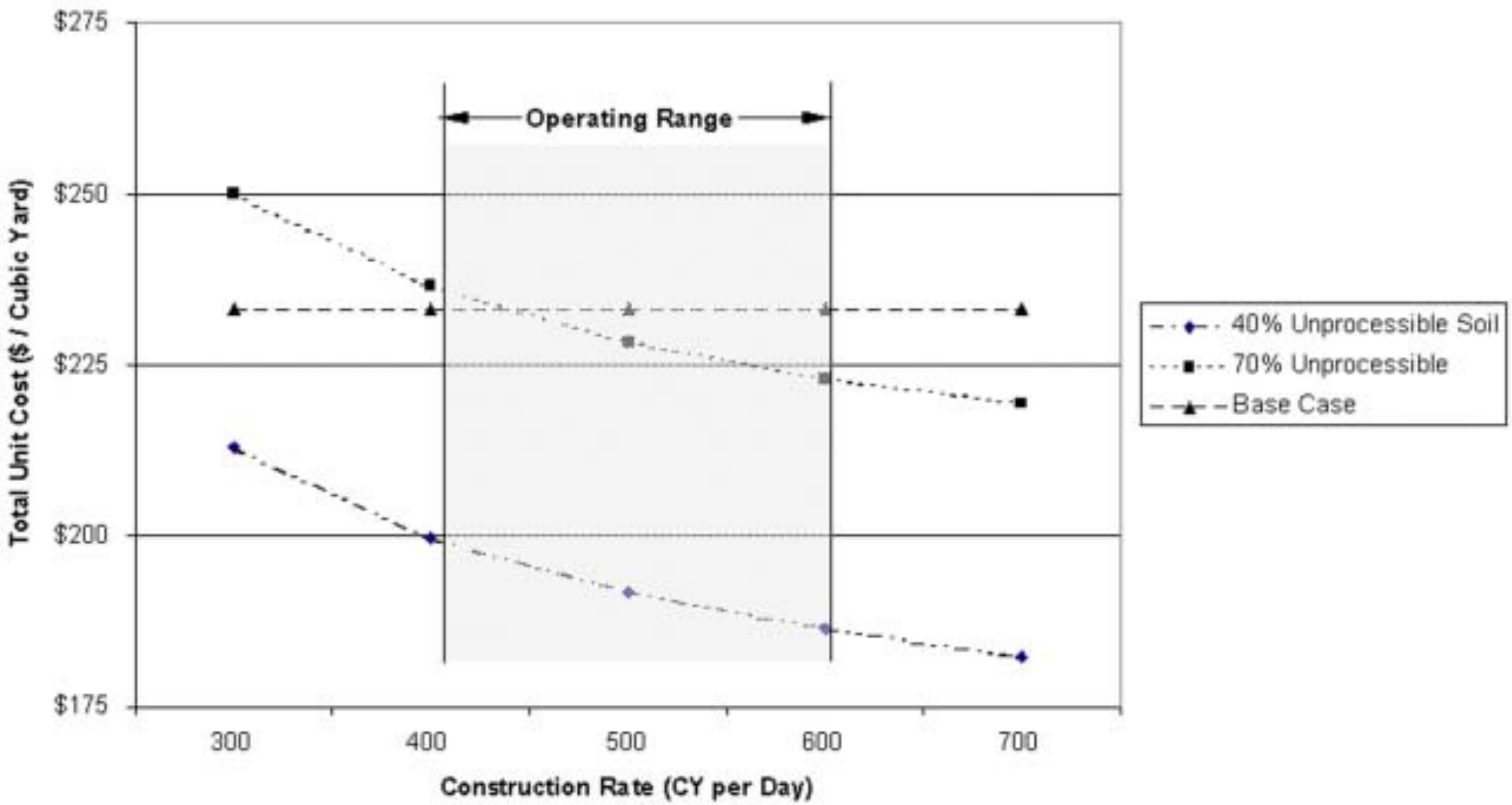


Exhibit 5 – Unit Cost Analysis – GSS Processing Construction Constrained – 400

Given: GSS Processing
750 cy/day system capacity
50,000 cy/season max
400 construction rate

Assume:

V = 345,896 cy Fixed for all cases
P = dependant on construction duration and soil throughput see sample calc
D_r = $233 per cy Fixed
D_a = $203 per cy Fixed
B_c = $1.02 per cy Fixed
R = 30% Fixed Coarse Fraction = 30% by volume
Fines Fraction = 0%

a % Unprocessible	r % Reuse	P	Process Factor	Rad Disposal	Alt Disposal	Backfill Credit	Unit Cost	Base
30%	100%	$33	$ 7,990,195	$ 63,671,267	$ -	$ 74,197	$ 207	$ 233
40%	100%	$38	$ 7,886,426	$ 66,089,163	$ -	$ 63,598	$ 214	$ 233
50%	100%	$46	$ 7,955,605	$ 68,507,059	$ -	$ 52,998	$ 221	$ 233
60%	100%	$57	$ 7,886,426	$ 70,924,956	$ -	$ 42,398	$ 228	$ 233
70%	100%	$76	$ 7,886,426	$ 73,342,852	$ -	$ 31,799	$ 235	$ 233
30%	50%	$33	$ 7,990,195	$ 63,671,267	$ 7,373,065	$ 37,099	$ 228	$ 233
40%	50%	$38	$ 7,886,426	$ 66,089,163	$ 6,319,770	$ 31,799	$ 232	$ 233
50%	50%	$46	$ 7,955,605	$ 68,507,059	$ 5,266,475	$ 26,499	$ 236	$ 233
60%	50%	$57	$ 7,886,426	$ 70,924,956	$ 4,213,180	$ 21,199	$ 240	$ 233
70%	50%	$76	$ 7,886,426	$ 73,342,852	$ 3,159,885	$ 15,899	$ 244	$ 233

V = total construction volume
P = process cost per cy
D_r = disposal cost per cy for radiologically-contaminated soil
D_a = disposal cost per cy for non-radiologically-contaminated soil
B_c = credit per cy on backfill for volume of soil reused onsite
R = percent of soil recovered as below criteria

**Exhibit 6 – Unit Cost Analysis – GSS Processing Only
Construction Constrained – 400 cy/d
(30% Coarse Fraction Volume)**

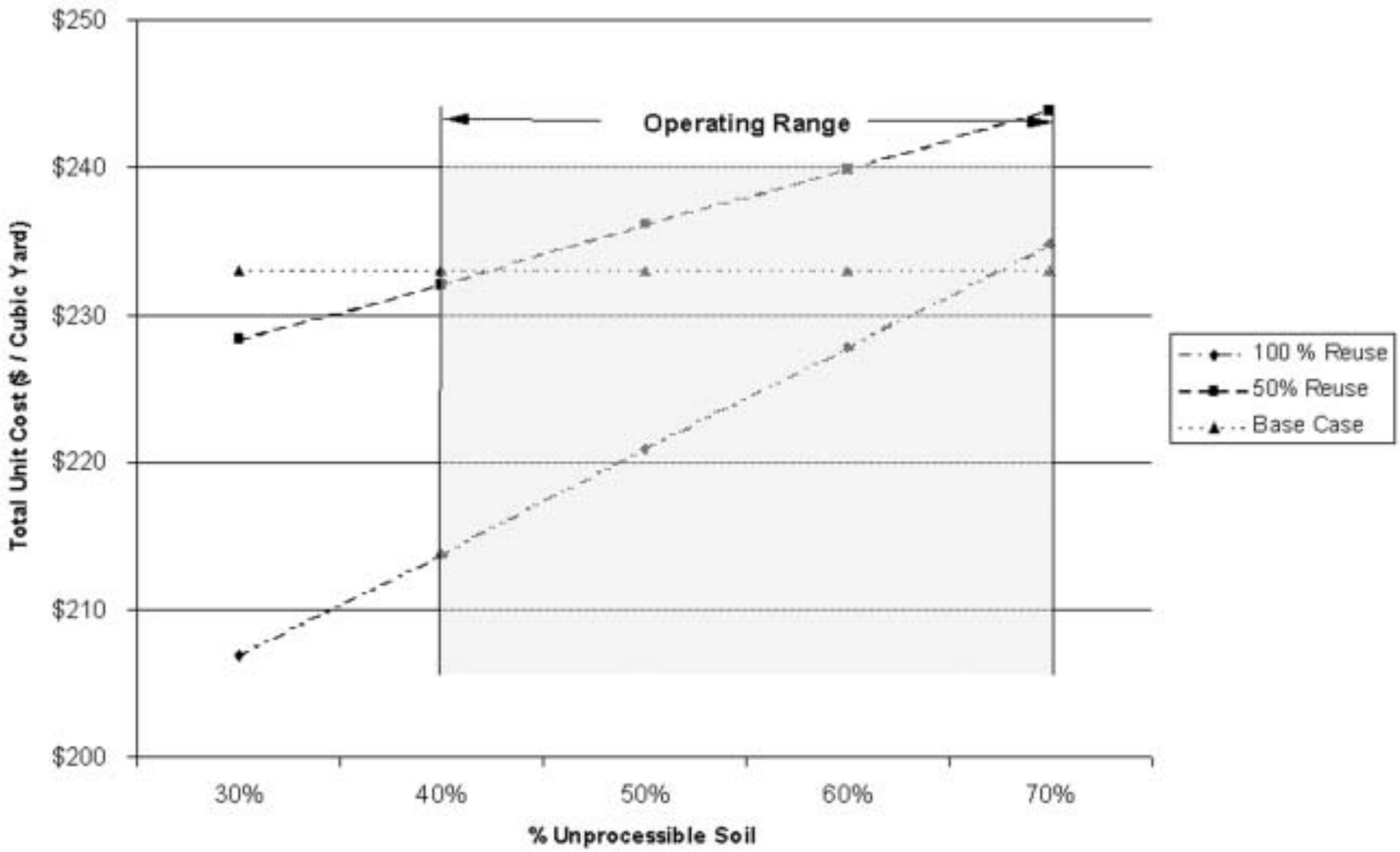


Exhibit 7 – Unit Cost Sensitivity – GSS Processing – Varying Construction Rate

Given: GSS Processing
750 cy/day system capacity
50,000 cy/season max
100 Reuse

Assume:

V =	345,896 cy	Fixed for all cases		
P =		dependant on construction duration and soil throughput see sample calc		
D_r =	$233 per cy	Fixed		
D_a =	$203 per cy	Fixed		
B_c =	$1.02 per cy	Fixed		
R =	30%	Fixed	Coarse Fraction =	30%by volume
r =	100%		Fines Fraction =	0%

a % Unprocessible	Construction Rate	P	Process Factor	Rad Disposal	Alt Disposal	Backfill Credit	Unit Cost	Base
40%	300	$51	$ 10,584,414	$ 66,089,163	$ -	$ 63,598	$ 221	$ 233
40%	400	$38	$ 7,886,426	$ 66,089,163	$ -	$ 63,598	$ 214	$ 233
40%	500	$30	$ 6,226,126	$ 66,089,163	$ -	$ 63,598	$ 209	$ 233
40%	600	$25	$ 5,188,438	$ 66,089,163	$ -	$ 63,598	$ 206	$ 233
40%	700	$22	$ 4,565,826	$ 66,089,163	$ -	$ 63,598	$ 204	$ 233
70%	300	$101	$ 10,480,645	$ 73,342,852	$ -	$ 31,799	$ 242	$ 233
70%	400	$76	$ 7,886,426	$ 73,342,852	$ -	$ 31,799	$ 235	$ 233
70%	500	$61	$ 6,329,895	$ 73,342,852	$ -	$ 31,799	$ 230	$ 233
70%	600	$51	$ 5,292,207	$ 73,342,852	$ -	$ 31,799	$ 227	$ 233
70%	700	$43	$ 4,462,057	$ 73,342,852	$ -	$ 31,799	$ 225	$ 233

V = total construction volume
P = process cost per cy
D_r = disposal cost per cy for radiologically-contaminated soil
D_a = disposal cost per cy for non-radiologically-contaminated soil
B_c = credit per cy on backfill for volume of soil reused onsite
R = percent of soil recovered as below criteria
r = percent of recovered soil that can be reused onsite

Exhibit 8 – Unit Cost Sensitivity – GSS Only
(100% Reuse; 30% Coarse Fraction Volume)

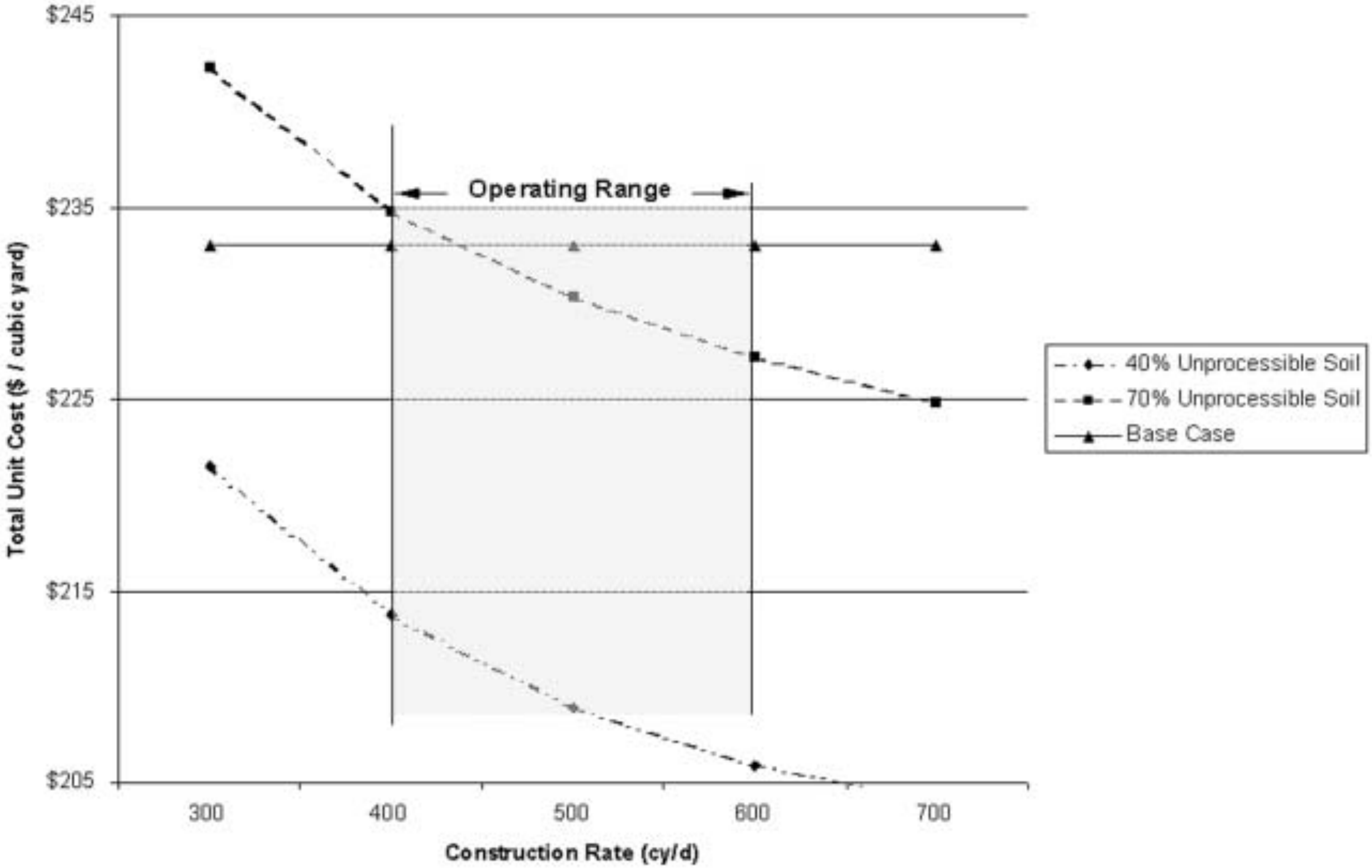


Exhibit 9 – Unit Cost Analysis – GSS Processing Construction Constrained – 400 cy/d

Given: GSS Processing
750 cy/day system capacity
50,000 cy/season max
400 construction rate

Assume:

V =	345,896 cy	Fixed for all cases
P =		dependant on construction duration and soil throughput see sample calc
D_r =	$233 per cy	Fixed
D_a =	$203 per cy	Fixed
B_c =	$1.02 per cy	Fixed
R =	15%	Fixed — Coarse Fraction = 15% by volume; Fines Fraction = 0%

a % Unprocessible	r % Reuse	P	Process Factor	Rad Disposal	Alt Disposal	Backfill Credit	Unit Cost	Base
30%	100%	$33	$ 7,990,195	$ 72,133,904	$ -	$ 37,099	$ 232	$ 233
40%	100%	$38	$ 7,886,426	$ 73,342,852	$ -	$ 31,799	$ 235	$ 233
50%	100%	$46	$ 7,955,605	$ 74,551,800	$ -	$ 26,499	$ 238	$ 233
60%	100%	$57	$ 7,886,426	$ 75,760,748	$ -	$ 21,199	$ 242	$ 233
70%	100%	$76	$ 7,886,426	$ 76,969,696	$ -	$ 15,899	$ 245	$ 233
30%	50%	$33	$ 7,990,195	$ 72,133,904	$ 3,686,532	$ 18,549	$ 242	$ 233
40%	50%	$38	$ 7,886,426	$ 73,342,852	$ 3,159,885	$ 15,899	$ 244	$ 233
50%	50%	$46	$ 7,955,605	$ 74,551,800	$ 2,633,237	$ 13,250	$ 246	$ 233
60%	50%	$57	$ 7,886,426	$ 75,760,748	$ 2,106,590	$ 10,600	$ 248	$ 233
70%	50%	$76	$ 7,886,426	$ 76,969,696	$ 1,579,942	$ 7,950	$ 250	$ 233

V = total construction volume
P = process cost per cy
D_r = disposal cost per cy for radiologically-contaminated soil
D_a = disposal cost per cy for non-radiologically-contaminated soil
B_c = credit per cy on backfill for volume of soil reused onsite
R = percent of soil recovered as below criteria

Exhibit 10 – Unit Cost Analysis – GSS Processing Only
Construction Constrained – 400 cy/d
15% Coarse Fraction Volume

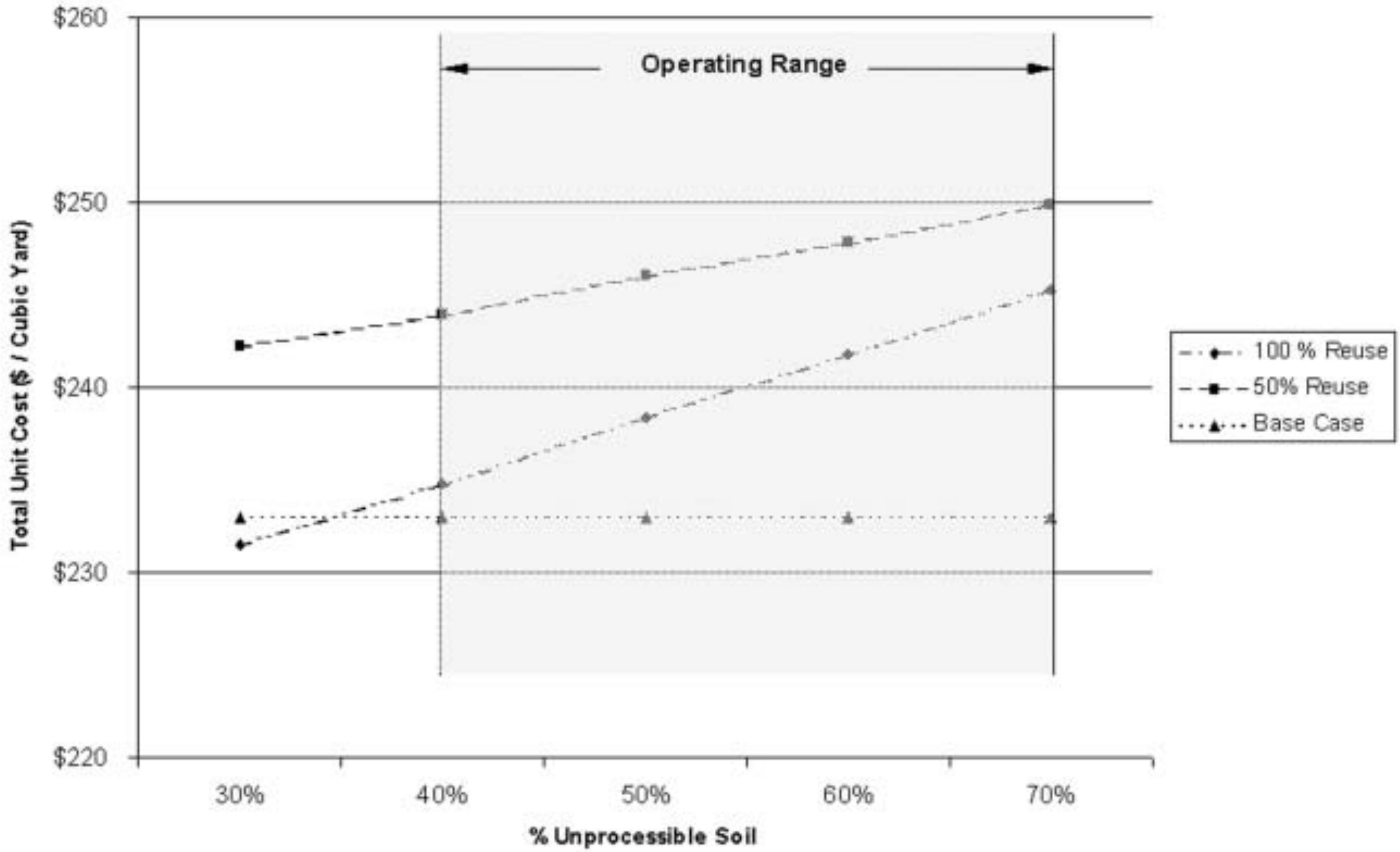


Exhibit 11 – Unit Cost Sensitivity – GSS Processing – Varying Construction Rate

Given: GSS Processing
750 cy/day system capacity
50,000 cy/season max
100 Reuse

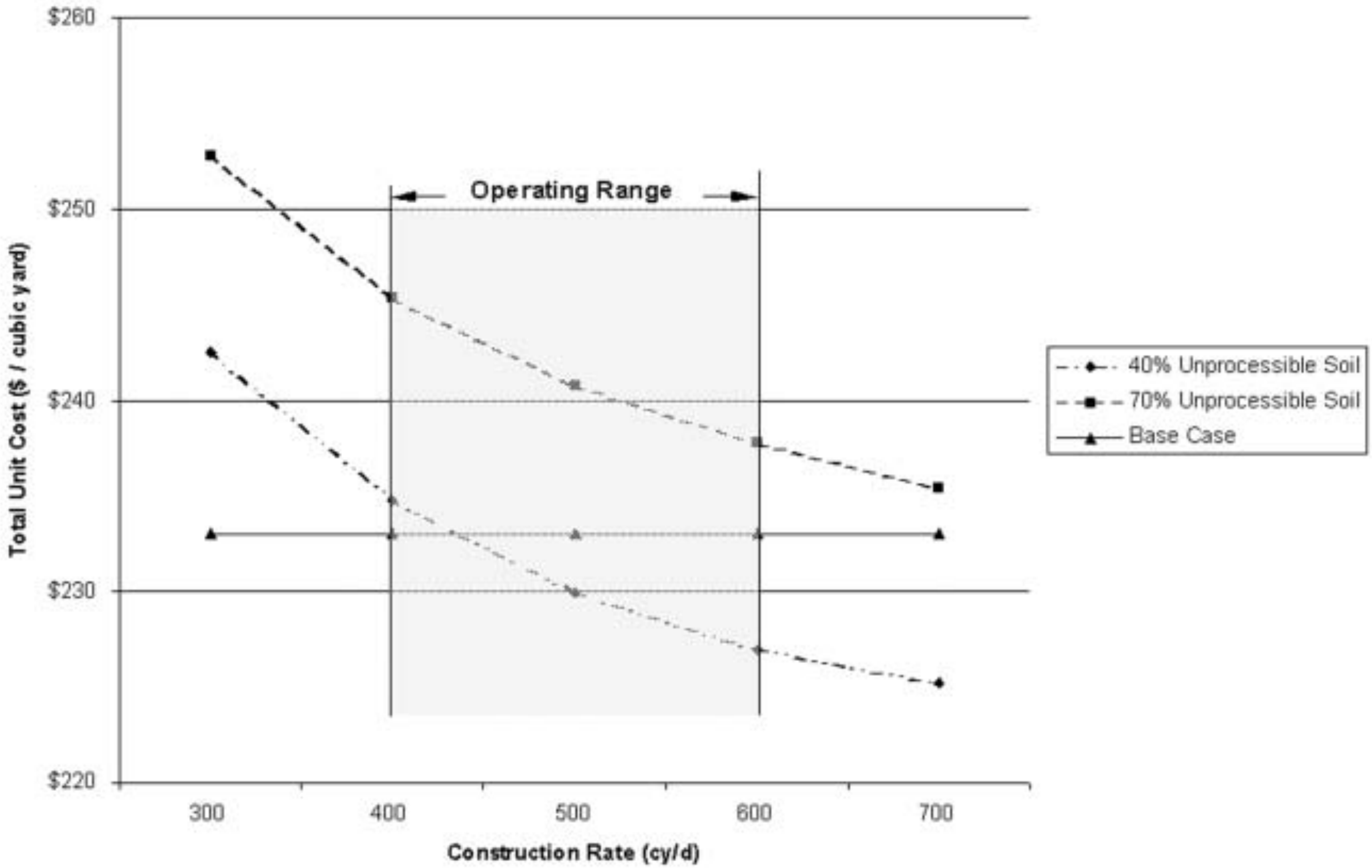
Assume:

V =	345,896 cy	Fixed for all cases		
P =		dependant on construction duration and soil throughput see sample calc		
D_r =	$233 per cy	Fixed		
D_a =	$203 per cy	Fixed		
B_c =	$1.02 per cy	Fixed		
R =	15%	Fixed	Coarse Fraction =	15% by volume
r =	100%		Fines Fraction =	0%

a % Unprocessible	Construction Rate	P	Process Factor	Rad Disposal	Alt Disposal	Backfill Credit	Unit Cost	Base
40%	300	$51	$ 10,584,414	$ 73,342,852	$ -	$ 31,799	$ 243	$ 233
40%	400	$38	$ 7,886,426	$ 73,342,852	$ -	$ 31,799	$ 235	$ 233
40%	500	$30	$ 6,226,126	$ 73,342,852	$ -	$ 31,799	$ 230	$ 233
40%	600	$25	$ 5,188,438	$ 73,342,852	$ -	$ 31,799	$ 227	$ 233
40%	700	$22	$ 4,565,826	$ 73,342,852	$ -	$ 31,799	$ 225	$ 233
70%	300	$101	$ 10,480,645	$ 76,969,696	$ -	$ 15,899	$ 253	$ 233
70%	400	$76	$ 7,886,426	$ 76,969,696	$ -	$ 15,899	$ 245	$ 233
70%	500	$61	$ 6,329,895	$ 76,969,696	$ -	$ 15,899	$ 241	$ 233
70%	600	$51	$ 5,292,207	$ 76,969,696	$ -	$ 15,899	$ 238	$ 233
70%	700	$43	$ 4,462,057	$ 76,969,696	$ -	$ 15,899	$ 235	$ 233

V = total construction volume
P = process cost per cy
D_r = disposal cost per cy for radiologically-contaminated soil
D_a = disposal cost per cy for non-radiologically-contaminated soil
B_c = credit per cy on backfill for volume of soil reused onsite
R = percent of soil recovered as below criteria
r = percent of recovered soil that can be reused onsite

Exhibit 12 – Unit Cost Sensitivity – GSS Only
(100% Reuse; 15% Coarse Fraction Volume)



7.0 CONCLUSIONS AND RECOMMENDATIONS

7.1 CONCLUSIONS

7.1.1 Radiological Soil Sorting

The RSS was designed to separate soil containing ROC activity in excess of selected setpoint criteria (rejected soil) from soil containing ROC activity below the selected setpoint criteria (accepted soil). Although construction methods and material handling techniques were varied, no method was discovered that did not result in the significant homogenization of the soils. The mixing of above and below criteria soil prior to the RSS reduces the effectiveness of the RSS. The RSS experienced a 34% acceptance error rate (above criteria material diverted to the below criteria pile) especially at lower setpoint values.

The utility of the U-238 detection and quantitation system on the RSS could not be effectively evaluated, because it was not operational during most of the Pilot Demonstration.

7.1.2 Particle Size Separation

Separation of the excavated soil into different size fractions is a proven mature technology that may provide substantial benefits in reducing the volume of soils requiring off-site disposal. Simple separation at the +3/8-inch size fraction produced an oversize product stream with lower gross activity than the feed soil. An even cleaner break may be achievable with a slightly larger top size, such as +1/2-inch or +3/4-inch. The unrinsed +3/8-inch oversize material met the current criteria of less than 15 pCi/g above background of Ra-226 + Th-232, and less than 50 pCi/g above background of U-238 in 20 out of 24 batches (**Table 14**). Operation of the rinse unit produced a significantly less radioactive oversize material product stream (**Table 15**). This was not surprising, since the radioactivity at the Maywood Site is primarily associated with the finer material.

The oversize product stream may be suitable for non-cohesive backfill for onsite or even off-site applications. In order to meet the geotechnical characteristics for permeability, blending the coarse fraction with finer grain material would be required and would increase process costs slightly.

7.1.3 Chemical Characteristics

In situ soil and processed material from various stockpiles was analyzed to determine if chemical constituents were preferentially concentrated in particular process streams or size fractions. No clear trends were observed. Chemicals were distributed fairly evenly over the various size fractions and process streams. Consistent or significant concentration was not observed in any size fraction or process stream. None of the material analyzed for chemical characteristics constituted a hazardous waste or other waste category requiring special handling or management.

7.1.4 Cost Performance

The cost performance of processing soil is measured in relation to the “base case.” The “base case” involves the cost to load railcars, rail transportation costs, and disposal fees at a licensed disposal facility. Current costs for the base case are in the range of $233 per cy. This number would be expected to drop based on competitive bidding of transportation and disposal services and operation efficiencies of loading under a full-scale construction program. The “process” scenario is considered to have a favorable cost performance if the unit cost for processing the soil is less than the “base case” of $233 per cy.

The cost performance evaluation of the combined RSS/GSS system is problematic given the high rate of acceptance errors of the RSS. Assuming a volume recovery of 30% coarse (+3/8-inch) and a 33% recovery of the fines from the RSS, construction operations that generate at least 423 cy per day would yield favorable cost performance only if all resulting material could be reused onsite and when more than 50% of the excavated soils are suitable for processing. Cost performance improves as the construction rate increases when all other variables remain the same until the equipment is processing material at its optimum capacity. Factors that limit the construction rate include property access and interference's with property owner operations, constraints caused by existing infrastructure, and potential annual funding limits.

Cost performance is sensitive to the volume of excavated material that can or would be processed. Material that clearly exceeds the radiological limits would not be processed by the RSS. Similarly, fine silty-sands and clay deposits from the wetland areas and stream channels might not warrant processing by the GSS due to the low percentage of material greater than 3/8 inch. Some of the material found on the Maywood Site could not be processed. Process waste found in the settling basins on the MISS and Stepan properties could not be processed based on physical characteristics. This material alone could account for over 75,000 cy of the total volume. The fraction of excavated material that would not or could not be processed reduces the cost performance of the overall system since it results in under utilization of the process equipment.

The GSS is a proven and relatively simple technology and the cost performance of operating the GSS alone was evaluated. Factors affecting the "GSS Only" scenario are similar to the GSS/RSS operation. Assuming a 30% volume recovery from +3/8-inch material and 100% reuse of the material onsite, the GSS-only scenario generally shows favorable cost performance. Cost performance of the GSS-only scenario is not cost effective under any condition analyzed if the volume of the coarse fraction equals 15% as estimated in the Engineering Test Pit Study for Maywood Soils. The GSS-only operation is not cost effective under the broader site soil characteristics (15% gravel), the expected percentage of unprocessible soil, and the anticipated daily construction rate.

7.2 RECOMMENDATIONS

7.2.1 Radiological Soil Sorter

The RSS did not demonstrate consistently reliable performance separating above-criteria from below-criteria soil. The RSS technology may be fundamentally unsuited to the type of material present at Maywood and the degree of physical processing required to prepare a feed material to the RSS.

Pending substantial further development and refinement of the existing RSS technology, this approach to volume reduction for the Maywood facility should not receive further consideration.

7.2.2 Gravel Separator

The GSS system can effectively separate coarse material from the finer radiologically-impacted material to a restricted use level (15 pCi/g Ra-226 + Th-232). It is likely that the gravel rinse system could achieve a product that is acceptable for an unrestricted use level (5 pCi/g Ra-226 + Th-232).

The cost performance of the GSS is favorable when the coarse fraction in the excavated material exceeds 30%. Cost performance would be negatively impacted if the percentage of coarse fraction is reduced and/or if the material could not be used onsite. Uncertainty exists in whether the coarse fraction experienced during the Pilot Demonstration Project are representative of the larger population of soils that would be encountered during remediation. The course fraction found from test pits on other areas of the

MISS was only 15% and soil excavated during subsequent remediation on vicinity properties appeared more consistent with the 15% course fraction as well. Additional uncertainty exists in the assumption over the acceptability of the material for reuse. One factor affecting the ability to reuse the material is the potential for chemical contamination that might be coincident with radiological contamination. Stockpiling of material and with intermittent GSS operations would increase cost performance of this technology but has public acceptability and site operability constraints. Based upon the operational problems / limitations of the system on the MISS, the uncertainties associated with water treatment and percent course fraction of the soil, and the cost analysis of the operating the system, it appears the potential benefits offered by the system are minimal. Therefore, it is recommended that the GSS-only scenario not be considered for use during remedial action at the FMSS site.

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8.0 REFERENCES / BIBLIOGRAPHY

1. Bechtel, 1987. *Characterization Report for the Maywood Interim Storage Site*, June 1987

2. Bechtel, 1992. *Remedial Investigation Report for the Maywood Site*, December 1992

3. CH_2M Hill, 1994. *Final Remedial Investigation Report, Stepan Company Property*, November 1994

4. US Congress 42USC9621, 2000. *Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)*, January 2000.

5. USACE New York District Office, 1998. *Final Maywood Soils Grouping Report, Volume 1, Maywood, New Jersey, Final,* USACE/OR/DACA62-1032, January 1998.

6. USACE, 1998. *Chemical Data Management for Hazardous Waste Remedial Activities*, ER 1110-1-263, 30 April 1998.

7. USACE, 1999a. *FUSRAP Maywood Superfund Site Soil Sorting/Soil Washing Technology Evaluation Report, WBS 8, Task 1*, prepared by Stone & Webster, April 1999.

8. USACE, 1999b. *Final Materials Handling / Transport and Disposal Plan*, prepared by Stone & Webster, July 1999.

9. USACE, 1999c. *Final Work Plan – Engineering Test Pits at MISS,* prepared by Stone & Webster, July 1999.

10. USACE, 1999d. *Final Site Safety and Health Plan*, prepared by Stone & Webster, August 1999.

11. USACE, 1999e. *Final Chemical Data Quality Management Plan, Revision 0*, prepared by Stone & Webster, October 1999.

12. USACE, 1999f. *Final Contractor Quality Control Plan*, prepared by Stone & Webster, October 1999.

13. USACE, 1999g. *Final General Environmental Protection Plan*, prepared by Stone & Webster, November 1999.

14. USACE, 2000a. *Final Work Plan – Pilot Demonstration,* prepared by Stone & Webster, June 2000.

15. USACE, 2000b. *Annual NESHAP Compliance Report*, prepared by Stone & Webster, 2000.

16. USEPA, 1986. *Test Methods for Evaluating Solid Waste, Physical / Chemical Methods, SW-846, Third Edition, Revision 1, Updates 1, 2, and 3*.

17. USEPA 40CFR300.430, 2001. *National Oil and Hazardous Substances Contingency Plan*, July 2001.

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TABLES

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Table 1a
Fractionation Tank Radiological Water Sample Results Summary

Process Date	S&W Full Sample ID	Batch ID	Analyte	Analytic Result	Units of Measure	MDA	Uncertainty	MAT_DESC	Lift ID
10/05/2000	12b-PT1-HN-FRC-SW-0-035388	TEST 2	GAlpha	126.98	pCi/L	0.94	4.76777	U	2
10/05/2000	12b-PT1-HN-FRC-SW-0-035388	TEST 2	GBeta	58.42	pCi/L	1.33	2.22013	U	2
10/05/2000	12b-PT1-HN-FRC-SW-0-035388	TEST 2	Ra-226	6.62	pCi/L	0.64	1.398	U	2
10/05/2000	12b-PT1-HN-FRC-SW-0-035388	TEST 2	Ra-228	13.68	pCi/L	1.90	2.27062	U	2
10/05/2000	12b-PT1-HN-FRC-SW-0-035388	TEST 2	Tot-U	6.91	µg/L	0.03	0.13870	U	2
10/05/2000	12b-PT1-HN-FRC-SW-0-035388	TEST 2	Tot-U	4.68	PCi/L	0.02	0.09390	U	2
10/05/2000	12b-PT1-HN-FRC-SW-0-035389	TEST 2	GAlpha	43.71	PCi/L	1.19	2.73720	U	2
10/05/2000	12b-PT1-HN-FRC-SW-0-035389	TEST 2	GAlpha	41.10	PCi/L	2.55	4.63	F	2
10/05/2000	12b-PT1-HN-FRC-SW-0-035389	TEST 2	GAlpha	41.10	PCi/L	2.55	4.63	F	2
10/05/2000	12b-PT1-HN-FRC-SW-0-035389	TEST 2	GBeta	22.15	PCi/L	2.00	2.17	F	2
10/05/2000	12b-PT1-HN-FRC-SW-0-035389	TEST 2	GBeta	22.15	PCi/L	2.00	2.17	F	2
10/05/2000	12b-PT1-HN-FRC-SW-0-035389	TEST 2	GBeta	21.96	PCi/L	0.99	1.35440	U	2
10/05/2000	12b-PT1-HN-FRC-SW-0-035389	TEST 2	Ra-226	2.08	PCi/L	0.18	0.3905	U	2
10/05/2000	12b-PT1-HN-FRC-SW-0-035389	TEST 2	Ra-228	4.97	PCi/L	0.46	0.59546	U	2
10/05/2000	12b-PT1-HN-FRC-SW-0-035389	TEST 2	Tot-U	3.46	µg/L	0.03	0.07068	U	2
10/05/2000	12b-PT1-HN-FRC-SW-0-035389	TEST 2	Tot-U	2.35	PCi/L	0.02	0.04785	U	2
10/05/2000	12b-PT1-HN-FRC-SW-0-035390	TEST 2	GAlpha	49.16	pCi/L	1.11	2.83574	U	2
10/05/2000	12b-PT1-HN-FRC-SW-0-035390	TEST 2	GBeta	23.83	pCi/L	0.93	1.32106	U	2
10/05/2000	12b-PT1-HN-FRC-SW-0-035390	TEST 2	Ra-226	2.14	pCi/L	0.10	0.4	U	2
10/05/2000	12b-PT1-HN-FRC-SW-0-035390	TEST 2	Ra-228	5.48	pCi/L	0.41	0.56069	U	2
10/05/2000	12b-PT1-HN-FRC-SW-0-035390	TEST 2	Tot-U	3.83	µg/L	0.03	0.10664	U	2
10/05/2000	12b-PT1-HN-FRC-SW-0-035390	TEST 2	Tot-U	2.60	pCi/L	0.02	0.07219	U	2
10/05/2000	12b-PT1-HN-FRC-SW-0-035391	TEST 2	GAlpha	1483.70	pCi/L	7.05	39.87752	U	2
10/05/2000	12b-PT1-HN-FRC-SW-0-035391	TEST 2	GBeta	599.17	pCi/L	7.46	15.17721	U	2
10/05/2000	12b-PT1-HN-FRC-SW-0-035391	TEST 2	Ra-226	44.78	pCi/L	0.82	5.369	U	2
10/05/2000	12b-PT1-HN-FRC-SW-0-035391	TEST 2	Ra-228	158.83	pCi/L	2.39	5.61406	U	2
10/05/2000	12b-PT1-HN-FRC-SW-0-035391	TEST 2	Tot-U	40.39	µg/L	0.03	4.97996	U	2
10/05/2000	12b-PT1-HN-FRC-SW-0-035391	TEST 2	Tot-U	27.34	pCi/L	0.02	3.37143	U	2

Table 1a
Fractionation Tank Radiological Water Sample Results Summary

Process Date	S&W Full Sample ID	Batch ID	Analyte	Analytic Result	Units of Measure	MDA	Uncertainty	MAT_DESC	Lift ID
10/05/2000	12b-PT1-HN-FRC-SW-0-035392	TEST 2	GAlpha	1140.73	pCi/L	6.20	28.14	F	2
10/05/2000	12b-PT1-HN-FRC-SW-0-035392	TEST 2	GAlpha	1140.73	pCi/L	6.20	28.14	F	2
10/05/2000	12b-PT1-HN-FRC-SW-0-035392	TEST 2	GAlpha	1124.84	pCi/L	2.98	23.56023	F	2
10/05/2000	12b-PT1-HN-FRC-SW-0-035392	TEST 2	GBeta	572.25	pCi/L	5.32	12.16	F	2
10/05/2000	12b-PT1-HN-FRC-SW-0-035392	TEST 2	GBeta	572.25	pCi/L	5.32	12.16	F	2
10/05/2000	12b-PT1-HN-FRC-SW-0-035392	TEST 2	GBeta	541.54	pCi/L	3.67	9.15736	F	2
10/05/2000	12b-PT1-HN-FRC-SW-0-035392	TEST 2	Ra-226	33.24	pCi/L	0.17	3.331	F	2
10/05/2000	12b-PT1-HN-FRC-SW-0-035392	TEST 2	Ra-228	164.30	pCi/L	0.59	2.67745	F	2
10/05/2000	12b-PT1-HN-FRC-SW-0-035392	TEST 2	Tot-U	8.90	µg/L	0.03	1.87427	F	2
10/05/2000	12b-PT1-HN-FRC-SW-0-035392	TEST 2	Tot-U	6.02	pCi/L	0.02	1.26888	F	2
10/05/2000	12b-PT1-HN-FRC-SW-0-035393	TEST 2	GAlpha	135.18	pCi/L	0.82	4.58998	F	2
10/05/2000	12b-PT1-HN-FRC-SW-0-035393	TEST 2	GBeta	60.37	pCi/L	0.88	1.74823	F	2
10/05/2000	12b-PT1-HN-FRC-SW-0-035393	TEST 2	Ra-226	9.26	pCi/L	0.24	1.347	F	2
10/05/2000	12b-PT1-HN-FRC-SW-0-035393	TEST 2	Ra-228	18.14	pCi/L	0.42	0.84890	F	2
10/05/2000	12b-PT1-HN-FRC-SW-0-035393	TEST 2	Tot-U	11.85	µg/L	0.03	0.26496	F	2
10/05/2000	12b-PT1-HN-FRC-SW-0-035393	TEST 2	Tot-U	8.03	pCi/L	0.02	0.17938	F	2
10/06/2000	12b-PT1-HN-FRC-SW-0-035401	7-1	GAlpha	12624.82	pCi/L	90.52	369.8766	U	1
10/06/2000	12b-PT1-HN-FRC-SW-0-035401	7-1	GBeta	5799.55	pCi/L	78.27	161.6395	U	1
10/06/2000	12b-PT1-HN-FRC-SW-0-035401	7-1	Ra-226	19.75	pCi/L	0.31	2.63	U	1
10/06/2000	12b-PT1-HN-FRC-SW-0-035401	7-1	Ra-228	-1.40	pCi/L	2.25	1.15302	U	1
10/06/2000	12b-PT1-HN-FRC-SW-0-035401	7-1	Tot-U	0.46	µg/L	0.03	0.02853	U	1
10/06/2000	12b-PT1-HN-FRC-SW-0-035401	7-1	Tot-U	0.31	pCi/L	0.02	0.01931	U	1
10/06/2000	12b-PT1-HN-FRC-SW-0-035402	7-1	GAlpha	2222.81	pCi/L	10.68	51.39	F	1
10/06/2000	12b-PT1-HN-FRC-SW-0-035402	7-1	GAlpha	2222.81	pCi/L	10.68	51.39	F	1
10/06/2000	12b-PT1-HN-FRC-SW-0-035402	7-1	GAlpha	1989.53	pCi/L	10.53	49.71667	F	1
10/06/2000	12b-PT1-HN-FRC-SW-0-035402	7-1	GBeta	934.66	pCi/L	8.58	19.71	F	1
10/06/2000	12b-PT1-HN-FRC-SW-0-035402	7-1	GBeta	934.66	pCi/L	8.58	19.71	F	1
10/06/2000	12b-PT1-HN-FRC-SW-0-035402	7-1	GBeta	931.65	pCi/L	7.97	19.76536	F	1

Table 1a
Fractionation Tank Radiological Water Sample Results Summary

Process Date	S&W Full Sample ID	Batch ID	Analyte	Analytic Result	Units of Measure	MDA	Uncertainty	MAT_DESC	Lift ID
10/06/2000	12b-PT1-HN-FRC-SW-0-035402	7-1	Ra-226	149.50	pCi/L	0.20	14.69	U	1
10/06/2000	12b-PT1-HN-FRC-SW-0-035402	7-1	Ra-228	221.19	pCi/L	0.58	3.32299	U	1
10/06/2000	12b-PT1-HN-FRC-SW-0-035402	7-1	Tot-U	0.26	µg/L	0.03	0.01657	F	1
10/06/2000	12b-PT1-HN-FRC-SW-0-035402	7-1	Tot-U	0.18	pCi/L	0.02	0.01122	F	1
10/06/2000	12b-PT1-HN-FRC-SW-0-035403	7-1	GAlpha	566.00	pCi/L	1.81	10.90346	F	1
10/06/2000	12b-PT1-HN-FRC-SW-0-035403	7-1	GBeta	396.99	pCi/L	1.37	5.09054	F	1
10/06/2000	12b-PT1-HN-FRC-SW-0-035403	7-1	Ra-226	5.19	pCi/L	0.86	1.442	U	1
10/06/2000	12b-PT1-HN-FRC-SW-0-035403	7-1	Ra-228	92.39	pCi/L	5.32	7.35820	U	1
10/06/2000	12b-PT1-HN-FRC-SW-0-035403	7-1	Tot-U	71.55	µg/L	0.03	2.57956	F	1
10/06/2000	12b-PT1-HN-FRC-SW-0-035403	7-1	Tot-U	48.44	pCi/L	0.02	1.74636	F	1
10/10/2000	12b-PT1-HN-FRC-SW-0-035415	8-3	GAlpha	53.13	pCi/L	1.82	4.14	U	1
10/10/2000	12b-PT1-HN-FRC-SW-0-035415	8-3	GBeta	27.04	pCi/L	1.52	2.04	U	1
10/10/2000	12b-PT1-HN-FRC-SW-0-035415	8-3	Tot-U	19.80	µg/L	0.03	0.92	U	1
10/10/2000	12b-PT1-HN-FRC-SW-0-035415	8-3	Tot-U	13.40	pCi/L	0.02	0.62	U	1
10/19/2000	12b-PT1-HN-FRC-SW-0-035614	7-4	GAlpha	39.63	pCi/L	4.82	6.84589	U	2
10/19/2000	12b-PT1-HN-FRC-SW-0-035614	7-4	GBeta	25.98	pCi/L	2.99	3.04078	U	2
10/19/2000	12b-PT1-HN-FRC-SW-0-035614	7-4	Ra-226	2.78	pCi/L	0.15	0.5186	U	2
10/19/2000	12b-PT1-HN-FRC-SW-0-035614	7-4	Ra-228	5.40	pCi/L	0.55	0.66450	U	2
10/19/2000	12b-PT1-HN-FRC-SW-0-035614	7-4	Tot-U	18.99	µg/L	0.03	1.26759	U	2
10/19/2000	12b-PT1-HN-FRC-SW-0-035614	7-4	Tot-U	12.86	pCi/L	0.02	0.85816	U	2
10/23/2000	12b-PT1-HN-FRC-SW-0-035628	6-3	GAlpha	43.05	pCi/L	2.75	4.64348	U	2
10/23/2000	12b-PT1-HN-FRC-SW-0-035628	6-3	GBeta	28.69	pCi/L	2.80	3.30390	U	2
10/23/2000	12b-PT1-HN-FRC-SW-0-035628	6-3	Ra-226	13.84	pCi/L	1.79	3.134	U	2
10/23/2000	12b-PT1-HN-FRC-SW-0-035628	6-3	Ra-228	12.62	pCi/L	2.09	2.27297	U	2
10/23/2000	12b-PT1-HN-FRC-SW-0-035628	6-3	Tot-U	9.70	µg/L	0.03	0.579	U	2
10/23/2000	12b-PT1-HN-FRC-SW-0-035628	6-3	Tot-U	6.57	pCi/L	0.02	0.39224	U	2
10/24/2000	12b-PT1-HN-FRC-SW-0-035654	6-3	GAlpha	18.09	pCi/L	1.82	2.77633	U	2
10/24/2000	12b-PT1-HN-FRC-SW-0-035654	6-3	GBeta	19.71	pCi/L	1.74	2.12450	U	2

Table 1a
Fractionation Tank Radiological Water Sample Results Summary

Process Date	S&W Full Sample ID	Batch ID	Analyte	Analytic Result	Units of Measure	MDA	Uncertainty	MAT_DESC	Lift ID
10/24/2000	12b-PT1-HN-FRC-SW-0-035654	6-3	Ra-226	1.11	pCi/L	0.19	0.3191	U	2
10/24/2000	12b-PT1-HN-FRC-SW-0-035654	6-3	Ra-228	2.41	pCi/L	0.38	0.42189	U	2
10/24/2000	12b-PT1-HN-FRC-SW-0-035654	6-3	Tot-U	8.00	µg/L	0.03	0.401	U	2
10/24/2000	12b-PT1-HN-FRC-SW-0-035654	6-3	Tot-U	5.41	pCi/L	0.02	0.27133	U	2
10/24/2000	12b-PT1-HN-FRC-SW-0-035690	6-3	GAlpha	549.68	pCi/L	4.27	16.09583	U	2
10/24/2000	12b-PT1-HN-FRC-SW-0-035690	6-3	GBeta	222.02	pCi/L	3.54	6.31743	U	2
10/24/2000	12b-PT1-HN-FRC-SW-0-035690	6-3	Ra-226	29.57	pCi/L	0.78	3.865	U	2
10/24/2000	12b-PT1-HN-FRC-SW-0-035690	6-3	Ra-228	36.91	pCi/L	1.08	1.83137	U	2
10/24/2000	12b-PT1-HN-FRC-SW-0-035690	6-3	Tot-U	16.20	µg/L	0.03	1.72	U	2
10/24/2000	12b-PT1-HN-FRC-SW-0-035690	6-3	Tot-U	10.99	pCi/L	0.02	1.16505	U	2
10/25/2000	12b-PT1-HN-FRC-SW-0-035711	7-4	GAlpha	303.62	pCi/L	4.55	14.47113	U	2
10/25/2000	12b-PT1-HN-FRC-SW-0-035711	7-4	GBeta	123.12	pCi/L	2.63	4.77528	U	2
10/25/2000	12b-PT1-HN-FRC-SW-0-035711	7-4	Ra-226	102.40	pCi/L	2.39	12.64	U	2
10/25/2000	12b-PT1-HN-FRC-SW-0-035711	7-4	Ra-228	115.02	pCi/L	3.19	5.58226	U	2
10/25/2000	12b-PT1-HN-FRC-SW-0-035711	7-4	Tot-U	10.80	µg/L	0.03	1.09	U	2
10/25/2000	12b-PT1-HN-FRC-SW-0-035711	7-4	Tot-U	7.32	pCi/L	0.02	0.73681	U	2
10/31/2000	12b-PT1-HN-FRC-SW-0-035755	6-6	GAlpha	19.30	pCi/L	1.96	2.91918	U	2
10/31/2000	12b-PT1-HN-FRC-SW-0-035755	6-6	GBeta	21.24	pCi/L	1.22	1.62192	U	2
10/31/2000	12b-PT1-HN-FRC-SW-0-035755	6-6	Ra-226	1.72	pCi/L	0.16	0.3927	U	2
10/31/2000	12b-PT1-HN-FRC-SW-0-035755	6-6	Ra-228	3.94	pCi/L	0.38	0.46737	U	2
10/31/2000	12b-PT1-HN-FRC-SW-0-035755	6-6	Tot-U	11.56	µg/L	0.03	1.02482	U	2
10/31/2000	12b-PT1-HN-FRC-SW-0-035755	6-6	Tot-U	7.83	pCi/L	0.02	0.694	U	2
11/01/2000	12b-PT1-HN-FRC-SW-0-035770	6-6	GAlpha	43.18	pCi/L	2.36	4.45396	U	2
11/01/2000	12b-PT1-HN-FRC-SW-0-035770	6-6	GBeta	27.31	pCi/L	2.01	2.50359	U	2
11/01/2000	12b-PT1-HN-FRC-SW-0-035770	6-6	Ra-226	2.67	pCi/L	0.23	0.5718	U	2
11/01/2000	12b-PT1-HN-FRC-SW-0-035770	6-6	Ra-228	4.08	pCi/L	0.57	0.63712	U	2
11/01/2000	12b-PT1-HN-FRC-SW-0-035770	6-6	Tot-U	10.40	µg/L	0.03	0.55	U	2
11/01/2000	12b-PT1-HN-FRC-SW-0-035770	6-6	Tot-U	7.05	pCi/L	0.02	0.37203	U	2

Table 1a
Fractionation Tank Radiological Water Sample Results Summary

Process Date	S&W Full Sample ID	Batch ID	Analyte	Analytic Result	Units of Measure	MDA	Uncertainty	MAT_DESC	Lift ID
11/01/2000	12b-PT1-HN-FRC-SW-0-035775	6-6	GAlpha	2912.73	pCi/L	69.22	158.7391	U	2
11/01/2000	12b-PT1-HN-FRC-SW-0-035775	6-6	GBeta	1449.66	pCi/L	37.00	58.80529	U	2
11/01/2000	12b-PT1-HN-FRC-SW-0-035775	6-6	Ra-226	67.25	pCi/L	0.71	7.733	U	2
11/01/2000	12b-PT1-HN-FRC-SW-0-035775	6-6	Ra-228	68.45	pCi/L	1.02	2.30091	U	2
11/01/2000	12b-PT1-HN-FRC-SW-0-035775	6-6	Tot-U	11.80	µg/L	0.03	1.27	U	2
11/01/2000	12b-PT1-HN-FRC-SW-0-035775	6-6	Tot-U	7.99	pCi/L	0.02	0.86048	U	2
11/02/2000	12b-PT1-HN-FRC-SW-0-035789	FCR #1	GAlpha	48.54	pCi/L	5.07	7.14011	U	NA
11/02/2000	12b-PT1-HN-FRC-SW-0-035789	FCR #1	GBeta	33.51	pCi/L	3.42	4.09021	U	NA
11/02/2000	12b-PT1-HN-FRC-SW-0-035789	FCR #1	Ra-226	3.71	pCi/L	0.28	0.7212	U	NA
11/02/2000	12b-PT1-HN-FRC-SW-0-035789	FCR #1	Ra-228	5.13	pCi/L	0.49	0.60648	U	NA
11/02/2000	12b-PT1-HN-FRC-SW-0-035789	FCR #1	Tot-U	15.84	µg/L	0.03	1.08821	U	NA
11/02/2000	12b-PT1-HN-FRC-SW-0-035789	FCR #1	Tot-U	10.70	pCi/L	0.02	0.737	U	NA

Notes:
pCi/L = picocuries per liter
µg/L = Micrograms per liter
MAT_DESC = Material description
U = Unfiltered
F = Filtered
Lift ID = Identified excavation layer number for the Soil Acquisition Area

Table 1b
Fractional Tank Chemical Water Sample Results Summary

Date of Sample Collection	S&W Full Sample ID	Analysis Name	Analytic Result	Result Qualifier	Units	IDL	Dilution	Batch ID	Analyte Group
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Methoxychlor		U	µg/L	0.5	1	FCR #3	Pesticides
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Aroclor-1242		U	µg/L	1	1	FCR #3	
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Aroclor-1232		U	µg/L	1	1	FCR #3	
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Aroclor-1221		U	µg/L	2	1	FCR #3	
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Aroclor-1016		U	µg/L	1	1	FCR #3	
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Toxaphene		U	µg/L	2.5	1	FCR #3	Pesticides
11/15/00	12b-PT1-HN-FRC-ID-0-035868	gamma-Chlordane	0.02	J	µg/L	0.05	1	FCR #3	Pesticides
11/15/00	12b-PT1-HN-FRC-ID-0-035868	alpha-Chlordane		U	µg/L	0.05	1	FCR #3	Pesticides
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Aluminum, Total	497.00		µg/L	200	1	FCR #3	Metals
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Endrin Ketone		U	µg/L	0.1	1	FCR #3	Pesticides
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Aroclor-1260		U	µg/L	1	1	FCR #3	
11/15/00	12b-PT1-HN-FRC-ID-0-035868	4,4'-DDT		U	µg/L	0.1	1	FCR #3	Pesticides
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Endosulfan Sulfate		U	µg/L	0.1	1	FCR #3	Pesticides
11/15/00	12b-PT1-HN-FRC-ID-0-035868	4,4'-DDD	0.05	J	µg/L	0.1	1	FCR #3	Pesticides
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Endosulfan II		U	µg/L	0.1	1	FCR #3	Pesticides
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Endrin		U	µg/L	0.1	1	FCR #3	Pesticides
11/15/00	12b-PT1-HN-FRC-ID-0-035868	4,4'-DDE	0.03	J	µg/L	0.1	1	FCR #3	Pesticides
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Dieldrin		U	µg/L	0.1	1	FCR #3	Pesticides
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Endrin Aldehyde		U	µg/L	0.1	1	FCR #3	Pesticides
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Bis(2-Chloroisopropyl) ether		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	2,4-Dichlorophenol		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Bis(2-Chloroethoxy) methane		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	2,4-Dimethylphenol		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	2-Nitrophenol		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Isophorone		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Nitrobenzene		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Hexachloroethane		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Aroclor-1248		U	µg/L	1	1	FCR #3	
11/15/00	12b-PT1-HN-FRC-ID-0-035868	4-Methylphenol		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Aroclor-1254		U	µg/L	1	1	FCR #3	
11/15/00	12b-PT1-HN-FRC-ID-0-035868	2-Methylphenol		U	µg/L	10	1	FCR #3	SVOC

Table 1b
Fractional Tank Chemical Water Sample Results Summary

Date of Sample Collection	S&W Full Sample ID	Analysis Name	Analytic Result	Result Qualifier	Units	IDL	Dilution	Batch ID	Analyte Group
11/15/00	12b-PT1-HN-FRC-ID-0-035868	1,2-Dichlorobenzene		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	1,4-Dichlorobenzene		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	1,3-Dichlorobenzene		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	2-Chlorophenol		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Bis(2-Chloroethyl) ether		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Phenol		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Aldrin	0.19		µg/L	0.05	1	FCR #3	Pesticides
11/15/00	12b-PT1-HN-FRC-ID-0-035868	N-Nitroso-di-n-propylamine		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Copper, Total	20.50	B	µg/L	25	1	FCR #3	Metals
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Endosulfan I		U	µg/L	0.05	1	FCR #3	Pesticides
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Potassium, Total	26500.00		µg/L	5000	1	FCR #3	Metals
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Nickel, Total	5.10	B	µg/L	40	1	FCR #3	Metals
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Molybdenum, Total	11.30	B	µg/L	20	1	FCR #3	Metals
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Mercury, Total	0.10	U	µg/L	0.2	1	FCR #3	Metals
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Manganese, Total	1390.00		µg/L	15	1	FCR #3	Metals
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Magnesium, Total	25000.00		µg/L	5000	1	FCR #3	Metals
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Silver, Total	1.00	U	µg/L	10	1	FCR #3	Metals
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Iron, Total	2020.00		µg/L	100	1	FCR #3	Metals
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Sodium, Total	33900.00		µg/L	5000	1	FCR #3	Metals
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Cobalt, Total	1.90	B	µg/L	50	1	FCR #3	Metals
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Chromium, Total	27.00		µg/L	10	1	FCR #3	Metals
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Calcium, Total	334000.00		µg/L	5000	1	FCR #3	Metals
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Cadmium, Total	0.50	U	µg/L	5	1	FCR #3	Metals
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Beryllium, Total	0.50	U	µg/L	5	1	FCR #3	Metals
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Barium, Total	51.70	B	µg/L	200	1	FCR #3	Metals
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Arsenic, Total	5.00	U	µg/L	10	1	FCR #3	Metals
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Antimony, Total	5.00	U	µg/L	60	1	FCR #3	Metals
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Lead, Total	20.40		µg/L	3	1	FCR #3	Metals
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Reactivity	0.00			0	1	FCR #3	
11/15/00	12b-PT1-HN-FRC-ID-0-035868	4-Chloroaniline		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Heptachlor	0.14		µg/L	0.05	1	FCR #3	Pesticides
11/15/00	12b-PT1-HN-FRC-ID-0-035868	gamma-BHC (Lindane)		U	µg/L	0.05	1	FCR #3	Pesticides

Table 1b
Fractional Tank Chemical Water Sample Results Summary

Date of Sample Collection	S&W Full Sample ID	Analysis Name	Analytic Result	Result Qualifier	Units	IDL	Dilution	Batch ID	Analyte Group
11/15/00	12b-PT1-HN-FRC-ID-0-035868	delta-BHC	0.04	J	µg/L	0.05	1	FCR #3	Pesticides
11/15/00	12b-PT1-HN-FRC-ID-0-035868	beta-BHC	0.06		µg/L	0.05	1	FCR #3	Pesticides
11/15/00	12b-PT1-HN-FRC-ID-0-035868	alpha-BHC	0.01	J	µg/L	0.05	1	FCR #3	Pesticides
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Corrosivity by pH	7.41		S.U.	0	1	FCR #3	Char
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Selenium, Total	5.00	U	µg/L	5	1	FCR #3	Metals
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Sulfide, Reactive	10.00	U	mg/kg	10	1	FCR #3	Char
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Heptachlor Epoxide		U	µg/L	0.05	1	FCR #3	Pesticides
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Petroleum Hydrocarbons	1.00	U	mg/L	1	1	FCR #3	
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Oil and Grease	2.90		mg/L	1	1	FCR #3	
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Cyanide, Reactive	0.50	U	mg/kg	0.5	1	FCR #3	Char
11/15/00	12b-PT1-HN-FRC-ID-0-035868	BOD5	2.00	U	mg/L	2	1	FCR #3	
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Ammonia	3.99		mg/L	0.04	1	FCR #3	
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Zinc, Total	186.00		µg/L	20	1	FCR #3	Metals
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Vanadium, Total	5.20	B	µg/L	50	1	FCR #3	Metals
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Thallium, Total	7.00	U	µg/L	10	1	FCR #3	Metals
11/15/00	12b-PT1-HN-FRC-ID-0-035868	TSS	5.00	U	mg/L	5	1	FCR #3	
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Methylene Chloride	0.40	J	µg/L	5	1	FCR #3	VOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Benzo(k)fluoranthene		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Chloroform	0.70	J	µg/L	5	1	FCR #3	VOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	1,2-Dichloroethene (trans)		U	µg/L	5	1	FCR #3	VOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	1,2-Dichloroethene (cis)		U	µg/L	5	1	FCR #3	VOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	1,1-Dichloroethane		U	µg/L	5	1	FCR #3	VOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	1,1-Dichloroethene		U	µg/L	5	1	FCR #3	VOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Vinyl Acetate		U	µg/L	10	1	FCR #3	
11/15/00	12b-PT1-HN-FRC-ID-0-035868	2-Butanone	4.00	J	µg/L	10	1	FCR #3	VOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Acetone	9.00	J	µg/L	10	1	FCR #3	VOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	1,1,1-Trichloroethane		U	µg/L	5	1	FCR #3	VOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Chloroethane		U	µg/L	10	1	FCR #3	VOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Vinyl Chloride		U	µg/L	10	1	FCR #3	VOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Bromomethane		U	µg/L	10	1	FCR #3	VOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Chloromethane		U	µg/L	10	1	FCR #3	VOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Benzo(g,h,i)perylene		U	µg/L	10	1	FCR #3	SVOC

Table 1b
Fractional Tank Chemical Water Sample Results Summary

Date of Sample Collection	S&W Full Sample ID	Analysis Name	Analytic Result	Result Qualifier	Units	IDL	Dilution	Batch ID	Analyte Group
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Dibenzo(a,h)anthracene		U	µg/L	10	1	FCR #3	
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Indeno(1,2,3-cd)pyrene		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	1,2,4-Trichlorobenzene		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Carbon Disulfide		U	µg/L	5	1	FCR #3	VOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Trans-1,3-Dichloropropene		U	µg/L	5	1	FCR #3	VOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Styrene		U	µg/L	5	1	FCR #3	VOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Ethylbenzene		U	µg/L	5	1	FCR #3	VOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Chlorobenzene		U	µg/L	5	1	FCR #3	VOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	1,1,2,2-Tetrachloroethane		U	µg/L	5	1	FCR #3	VOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Toluene		U	µg/L	5	1	FCR #3	VOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Tetrachloroethene		U	µg/L	5	1	FCR #3	VOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	2-Hexanone		U	µg/L	10	1	FCR #3	VOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	1,2-Dichloroethane		U	µg/L	5	1	FCR #3	VOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Bromoform		U	µg/L	5	1	FCR #3	VOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Benzo(b)fluoranthene		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Benzene	0.20	J	µg/L	5	1	FCR #3	VOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	1,1,2-Trichloroethane		U	µg/L	5	1	FCR #3	VOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Dibromochloromethane		U	µg/L	5	1	FCR #3	VOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Trichloroethene		U	µg/L	5	1	FCR #3	VOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	cis-1,3-Dichloropropene		U	µg/L	5	1	FCR #3	VOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	1,2-Dichloropropane		U	µg/L	5	1	FCR #3	VOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Bromodichloromethane		U	µg/L	5	1	FCR #3	VOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Carbon Tetrachloride		U	µg/L	5	1	FCR #3	VOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	4-Methyl-2-Pentanone		U	µg/L	10	1	FCR #3	VOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	2-Nitroaniline		U	µg/L	50	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Benzo(a)pyrene		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Dibenzofuran		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	4-Nitrophenol		U	µg/L	50	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	2,4-Dinitrophenol		U	µg/L	50	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Acenaphthene		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	3-Nitroaniline		U	µg/L	50	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	2,6-Dinitrotoluene		U	µg/L	10	1	FCR #3	SVOC

Table 1b
Fractional Tank Chemical Water Sample Results Summary

Date of Sample Collection	S&W Full Sample ID	Analysis Name	Analytic Result	Result Qualifier	Units	IDL	Dilution	Batch ID	Analyte Group
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Diethylphthalate		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Dimethylphthalate		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	4-Chlorophenyl-phenyl ether		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	2-Chloronaphthalene		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	2,4,5-Trichlorophenol		U	µg/L	50	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	2,4,6-Trichlorophenol		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Hexachlorocyclopentadien e		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	2-Methylnaphthalene		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	4-Chloro-3-methylphenol		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Hexachlorobutadiene		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Total Xylene		U	µg/L	5	1	FCR #3	VOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Acenaphthylene		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Anthracene		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Di-n-octylphthalate		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	bis(2-Ethylhexyl)phthalate		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Chrysene		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Benzo(a)anthracene		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	3,3'-Dichlorobenzidine		U	µg/L	20	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Butyl benzyl phthalate		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Pyrene	0.30	J	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	2,4-Dinitrotoluene		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Di-n-butylphthalate		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Naphthalene		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Phenanthrene		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Pentachlorophenol		U	µg/L	50	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Hexachlorobenzene		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	4-Bromophenyl-phenyl ether		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	N-nitroso diphenylamine	1.00	J	µg/L	10	1	FCR #3	
11/15/00	12b-PT1-HN-FRC-ID-0-035868	4,6-Dinitro-2-methylphenol		U	µg/L	50	1	FCR #3	SVOC

Table 1b
Fractional Tank Chemical Water Sample Results Summary

Date of Sample Collection	S&W Full Sample ID	Analysis Name	Analytic Result	Result Qualifier	Units	IDL	Dilution	Batch ID	Analyte Group
11/15/00	12b-PT1-HN-FRC-ID-0-035868	4-Nitroaniline		U	µg/L	50	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Fluorene		U	µg/L	10	1	FCR #3	SVOC
11/15/00	12b-PT1-HN-FRC-ID-0-035868	Fluoranthene		U	µg/L	10	1	FCR #3	SVOC

Notes:
U - Non-detected
J – Estimated Result Value
B – Blank Contamination
µg/L – microgram per liter
mg/kg – milligram per kilogram

Table 2
Radiological Sampling Requirements

Sample Location	Testing Location	Sample Type / Media	Frequency(1)	Radiological Analyses	Rationale
In situ – Prior to Excavation (Screen/Sample Location 1)(2)	Field Screening	Scan / Soil	Entire lift – 100% scan	Sodium Iodide	Establish insitu conditions prior to excavation for activity tracking of input process stream Collect data to define slugs and batches
	Onsite Laboratory	Grab / Soil	One sample per grid within each slug	Gamma Spectroscopy	
Test Run Material	Field Screening	Scan / Soil	Entire stockpile – 100% scan	Sodium Iodide	Verify below criteria prior to use in test run of equipment
	Offsite Laboratory	Grab / Soil	One sample	Gamma Spectroscopy	
Material Not Processed (Screen/Sample Location 2) (2)	Field Screening	Scan / Bulk (Oversize construction debris and trash)	Entire stockpile - 100% scan	Sodium Iodide	Evaluate for final disposition
	Onsite Laboratory	Wipe / Bulk (Oversize construction debris)	One sample per batch or 50 cubic yards, whichever is less	Gamma Spectroscopy – Surface wipes, use surface activity / mass ratio	
	Onsite Laboratory	Grab / Soil	One sample per 50 cubic yards (Retention Pond Material and below criteria soil, based on in situ gamma survey, only)	Gamma Spectroscopy	
Output from Gravel Separation *Oversize and Debris (> 6 inches)* (Screen/Sample Location 3) (2)	Field Screening	Scan / Bulk	100% scan of each slug stockpile and each batch stockpile	Sodium Iodide	Evaluate for final disposition
	Onsite Laboratory	Wipe / Bulk (Oversize construction debris)	One sample per batch or 50 cubic yards, whichever is less	Gamma Spectroscopy – Surface wipes, use surface activity / mass ratio	
Output from Gravel Separation (prior to rinse) *Coarse Material (3/8 – 6 inches)* (Screen/Sample Location 4) (2)	Onsite Laboratory	Grab / Soil	4-5 samples over course of demonstration	Gamma Spectroscopy	Determine applicability of gravel rinse system
Output from Gravel Rinse *Filter Cake* (Screen/Sample Location 5) (2)	Onsite Laboratory	Grab / Sludge	One sample for each batch	Gamma Spectroscopy	Characterize material for disposal
Output from Gravel Rinse *Coarse Material (3/8 – 6 inches)* (Screen/Sample Location 6) (2)	Field Screening	Scan / Soil	100% scan of each slug stockpile and each batch stockpile	Sodium Iodide	Evaluate for final disposition
	Onsite Laboratory	Grab / Soil	One sample for each batch or 50 cubic yards, whichever is less	Gamma Spectroscopy	
Output from Gravel Separation and Rinse/ Input to Radiological Soil Sorting (< 3/8 inch) (Screen/Sample Location 7) (2)	Onsite Laboratory	Composite / Soil	4-5 samples over course of demonstration	Gamma Spectroscopy of fractions following grain size analysis	Evaluate use of different screen sizes
	Onsite Laboratory	Grab / Soil	Three samples per slug	Gamma Spectroscopy	Characterize intermediate process stream for activity tracking
Output from Radiological Soil Sorting *Above Criteria* (Screen/Sample Location 8) (2)	Field Screening	Scan / Soil	100% scan of each slug stockpile	Sodium Iodide	Characterize output process stream for activity tracking Characterize material for disposal
	Onsite Laboratory	Grab / Soil	Three samples for each slug and one sample for each batch or 50 cubic yards, whichever is less	Gamma Spectroscopy	
Output from Radiological Soil Sorting *Below Criteria* (Screen/Sample Location 9) (2)	Field Screening	Scan / Soil	100% scan of each slug stockpile	Sodium Iodide	Characterize output process stream for activity tracking Evaluate for final disposition
	Onsite Laboratory	Grab / Soil	Three samples for each slug and one sample for each batch or 50 cubic yards, whichever is less	Gamma Spectroscopy	
Final Status Survey – Refer to Soil Acquisition Plan in Volume 2	Offsite Laboratory	Grab / Soil	To be submitted as part of Final Status Survey Work Plan at later date		Document compliance with project clean up goals Perform MARSSIM-type survey of base
Excavation Water (if not used for dust control)	Offsite Laboratory	Grab / Water	One sample per frac tank	Gamma Spectroscopy, Gross Alpha, Gross Beta	Characterize water for disposal
Process Wastewater	Offsite Laboratory	Grab / Water	One sample per frac tank	Gamma Spectroscopy, Gross Alpha, Gross Beta	Characterize water for disposal
Decontamination Wastewater (if not used for dust control)	Offsite Laboratory	Grab / Water	One sample per drum	Gamma Spectroscopy, Gross Alpha, Gross Beta	Characterize water for disposal

Notes:
1. A batch consists of a pre-determined quantity of soil with characteristics which satisfy a specific objective. Each slug (consisting of 8 – 10 cubic yards within the batch) will undergo detailed sampling to facilitate activity tracking. Slugs will be processed one per batch initially, and less frequently as the objectives are realized. In addition, QA/QC samples will be collected at a frequency of ten percent each for all samples.
2. Refer to Figure 3 for Screen/Sample Locations

Table 3
Chemical & Geotechnical Sampling Requirements

Sample Location	Testing Location	Sample Type / Media	Frequency (1)	Chemical Analyses(2)	Rationale
In situ Prior to Excavation (Sample location 1) (3)	Offsite Laboratory	Grab / Soil	Approximately one sample per 1000 cubic yards of in place soil	VOCs, SVOCs, TAL Metals & Mo, Pesticides, PCBs, TRPH, Waste Characteristics	Characterize material for disposal
Test Run Material	Offsite Laboratory	Grab / Soil	One sample	VOCs, SVOCs, Pesticides, PCBs, TAL metals	Verify not contaminated prior to use in test run of equipment
Material Not Processed (Screen/Sample Location 2) (3)	Offsite Laboratory	Grab / Soil	One sample per 50 cubic yards (Retention Pond Material and below criteria soil, based on in situ survey, only)	VOCs, SVOCs, TAL Metals & Mo, Pesticides, PCBs, TRPH, Waste Characteristics	Evaluate for final disposition.
	Offsite Laboratory	Wipe / Bulk (Oversize construction debris)	One sample per batch or 50 cubic yards, whichever is less	VOCs, SVOCs, TAL Metals, Pesticides, PCBs – use surface activity/mass ratio	
Output from Gravel Separation *Oversize and Debris (> 6 inches)* (Screen/Sample Location 3) (3)	Offsite Laboratory	Wipe / Bulk (Oversize construction debris)	One sample per batch or 50 cubic yards, whichever is less	VOCs, SVOCs, TAL Metals, Pesticides, PCBs - use surface activity/mass ratio	Evaluate for final disposition.
Output from Gravel Rinse *Filter Cake* (Sample Location 5) (3)	Offsite Laboratory	Grab / Sludge	One sample for each batch	VOCs, SVOCs, TAL Metals & Mo, Pesticides, PCBs, TRPH, Waste Characteristics	Characterize material for disposal
Output from Gravel Rinse *Coarse Material (3/8 – 6 inches)* (Sample Location 6) (3)	Offsite Laboratory	Grab / Soil	One sample per batch or 50 cubic yards, whichever is less	VOCs, SVOCs, TAL Metals & Mo, Pesticides, PCBs, TRPH, Waste Characteristics	Evaluate for final disposition
Output from Gravel Separation and Rinse Input to Radiological Soil Sorting (< 3/8 inch) (Sample Location 7) (3)	Offsite Laboratory	Composite / Soil	4-5 samples over course of demonstration	Grain Size Distribution	Evaluate use of different screen sizes
Output from Radiological Soil Sorting *Above Criteria* (Sample Location 8) (3)	Offsite Laboratory	Grab / Soil	One sample per batch or 50 cubic yards, whichever is less	VOCs, SVOCs, TAL Metals & Mo, Pesticides, PCBs, TRPH, Waste Characteristics	Characterize material for disposal
Output from Radiological Soil Sorting *Below Criteria* (Sample Location 9) (3)	Offsite Laboratory	Grab / Soil	One sample per batch or 50 cubic yards, whichever is less	VOCs, SVOCs, TAL Metals & Mo, Pesticides, PCBs, TRPH, Waste Characteristics	Evaluate for final disposition
Excavation Water (if not used for dust control)	Offsite Laboratory	Grab / Water	One sample per frac tank	VOCs, SVOCs, TAL Metals & Mo, Pesticides, PCBs, TRPH, pH, Total Suspended Solids, Biological Oxygen Demand, Ammonia as Nitrogen, Oil and Grease	Characterize water for disposal
Process Wastewater	Offsite Laboratory	Grab / Water	One sample per frac tank	VOCs, SVOCs, TAL Metals & Mo, Pesticides, PCBs, TRPH, pH, Total Suspended Solids, Biological Oxygen Demand, Ammonia as Nitrogen, Oil and Grease	Characterize water for disposal
Decontamination Wastewater (if not used for dust control)	Offsite Laboratory	Grab / Water	One sample per drum	VOCs, SVOCs, TAL Metals & Mo, Pesticides, PCBs, TRPH, pH, Total Suspended Solids, Biological Oxygen Demand, Ammonia as Nitrogen, Oil and Grease	Characterize water for disposal

Notes:

1. A batch consists of a pre-determined quantity of soil with characteristics which satisfy a specific objective. Each slug (consisting of 8 – 10 cubic yards of the batch) will undergo detailed sampling to facilitate mass and activity tracking. Slugs will be processed one per batch initially, and less frequently as the objectives are realized. In addition, QA/QC samples will be collected at a frequency of ten percent each for all samples.
2. Waste Characteristics consist of pH, TCLP, Total Organic Halides, Paint Filter Liquid Test, Flashpoint, Reactive Cyanide, and Reactive Sulfide. Soil and water analyses listed are provided as example only. Disposal analyses to be performed in accordance with the permit for the selected receiving facility.
3. Refer to Figure 3 for Screen/Sample Locations

Table 4
Percent Oversize Removal

Batch ID	Total Mass (tons)	Oversize Mass (tons)	Percent (%) Oversize, >3/8-inch to <6-inch
1	38.685	10.420	26.90%
2	56.130	14.355	25.60%
3	142.840	31.180	21.80%
4	58.565	13.950	23.80%
5	101.745	28.800	28.30%
7	170.815	59.315	34.70%
8	142.630	44.840	31.40%
9	108.840	38.485	35.40%
1-1	741.020	287.660	38.80%
8-1	271.570	68.025	25.00%
8-2	300.890	52.370	17.40%
6-1	267.000	57.050	21.40%
1-3	127.000	48.400	38.10%
1-5	174.495	48.325	27.70%
Batch Test #2	26.200	9.200	35.10%
7-1	259.200	94.200	36.30%
8-3	354.620	99.780	28.10%
Sequence #5	15.940	3.900	24.50%
7-4	115.230	44.240	38.40%
7-5	196.960	77.165	39.20%
7-6	227.500	108.800	47.80%
6-6	191.700	62.800	32.80%
6-7	371.000	121.100	32.60%
8-5	205.400	67.200	32.70%
Recycled Water Test	17.700	4.200	23.70%
Full Capacity Run #1	504.400	117.410	23.30%
Full Capacity Run #2	138.900	36.300	26.10%
Full Capacity Run #3	476.800	130.200	27.30%
Full Capacity Run #4	749.500	332.500	44.40%
		Total Average	31.85%

Table 5
Gravel Separation System Production Rates

Date	GSS Production Hours	Weight (tons)	GSS Production (tons/hr)
08/17/2000	3.00	7.92	2.64
08/18/2000	2.50	38.69	15.47
08/21/2000	5.00	56.13	11.23
08/22/2000	5.33	142.84	26.80
08/23/2000	3.16	58.57	18.53
08/24/2000	4.00	101.75	25.44
08/28/2000	5.49	170.82	31.11
08/29/2000	3.75	142.63	38.03
08/30/2000	3.08	108.84	35.34
08/31/2000	4.96	147.68	29.77
09/01/2000	4.08	128.00	31.37
09/05/2000	2.75	88.13	32.05
09/06/2000	4.83	205.08	42.46
09/07/2000	2.88	182.27	63.29
09/08/2000	4.08	132.91	32.57
09/11/2000	2.83	99.03	34.99
09/13/2000	5.91	118.80	20.10
09/14/2000	5.83	221.52	38.00
09/21/2000	7.33	105.47	14.39
09/26/2000	3.33	79.52	23.88
09/27/2000	1.50	127.00	84.67
10/02/2000	4.37	52.32	11.97
10/03/2000	4.16	174.50	41.95
10/04/2000	3.16	42.50	13.45
10/05/2000	3.25	46.10	14.18
10/06/2000	2.91	84.70	29.11
10/09/2000	7.16	174.50	24.37
10/10/2000	4.16	172.60	41.49
10/11/2000	6.66	119.10	17.88
10/12/2000	4.16	68.50	16.47
10/13/2000	2.24	30.90	13.79
10/16/2000	4.16	163.72	39.35
10/17/2000	6.33	41.10	6.49
10/18/2000	2.16	28.70	13.29
10/19/2000	4.04	84.90	21.01
10/20/2000	2.49	30.84	12.39
10/23/2000	4.66	47.04	10.09
10/24/2000	4.91	126.23	25.71
10/25/2000	4.66	115.23	24.73
10/26/2000	2.58	196.96	76.34
10/27/2000	4.66	227.50	48.82
10/30/2000	4.50	253.00	56.22
10/31/2000	5.16	383.40	74.30
11/01/2000	3.33	87.60	26.31
11/02/2000	5.16	371.00	71.90
11/03/2000	3.16	98.70	31.23
11/07/2000	3.16	205.40	65.00
11/08/2000	4.66	51.50	11.05
11/13/2000	5.41	504.40	93.23
11/14/2000	1.16	138.90	119.74
11/15/2000	4.66	476.80	102.32
11/16/2000	4.66	749.50	160.84
	213.52 Total Production Hours		37.83 Average
			160.84 Maximum
			2.64 Minimum

Table 6
Radiological Separation System Production Rates

Date	RSS Production Hours	Weight (tons)	RSS Production (tons/hour)
8/17/00	1.5	5.65	3.77
8/18/00	2.5	22.835	9.13
8/21/00	5	42.425	8.49
8/22/00	6.08	97.34	16.01
8/23/00	2.64	45.43	17.21
8/24/00	6.25	55.825	8.93
8/28/00	5.4	128.93	23.88
8/29/00	4.88	102	20.90
8/30/00	4.5	70.265	15.61
8/31/00	5.72	96.37	16.85
9/1/00	4.08	92.165	22.59
9/5/00	3.08	54.03	17.54
9/6/00	6	136.965	22.83
9/7/00	4.88	123.225	25.25
9/8/00	4.66	89.805	19.27
9/11/00	6.33	56.44	8.92
9/12/00	2.55	29.04	11.39
9/13/00	4.11	78.29	19.05
9/14/00	5.83	110.24	18.91
9/18/00	7.33	14.43	1.97
9/19/00	5.28	91.15	17.26
9/20/00	4.05	36.845	9.10
9/21/00	6.33	64.815	10.24
9/26/00	3.33	34.875	10.47
9/27/00	5.5	70	12.73
9/29/00	7.33	8.5	1.16
10/2/00	5.45	39.195	7.19
10/3/00	4.88	117.835	24.15
10/4/00	4.16	29.6	7.12
10/5/00	3.33	28.3	8.50
10/6/00	4.91	59.9	12.20
10/9/00	5.66	115.2	20.35
10/10/00	5.41	108.2	20.00
10/11/00	3.99	81	20.30
10/12/00	1.99	43	21.61
10/13/00	2.74	20.6	7.52
10/16/00	4.99	107.13	21.47
10/17/00	4.49	23.9	5.32
10/18/00	2.16	17.2	7.96
10/19/00	4.37	56.6	12.95
10/20/00	3.49	16.07	4.60
10/23/00	4.66	22.905	4.92
10/24/00	5.41	65.62	12.13
10/25/00	4.91	72.235	14.71
10/26/00	4.91	110.27	22.46
10/27/00	4.66	107.67	23.11
10/30/00	4.48	108.975	24.32
10/31/00	7.16	180.89	25.26
11/1/00	3.33	12.87	3.86
11/2/00	5.66	140.08	24.75
11/7/00	5.66	137.475	24.29
11/8/00	4.16	26.6	6.39
	242.16 Total Production Hours		14.56 Average
			25.26 Maximum
			1.16 Minimum

Table 7
NaI Detector Arrays

	Array 1 (Thick)	Array 2 (Thin)
Detector Dimensions	2” x 4” x 4”	0.16” x 4” x 4”
Number of Detectors in Array	8	8
Nuclide(s) of Interest	Th-232 and Ra-226	U-238
Energy Window Setting	480keV – 750keV	40keV – 110keV
Calibration	Th-232	U-238

Table 8
LLDs for the Pilot Demonstration RSS

Radionuclide	Sample Type	LLD (pCi/g)
U-238	Batch	19.6
	Segment	25.9
Th-232	Batch	1.5
	Segment	2.4

Table 9
Background Levels of Radionuclides for the Pilot Demonstration

Radionuclide	Grab Sample Activity (pCi/g)	MDAs (pCi/g)	Uncertainty (pCi/g)	RSS Background Activity
U-238	-0.23 (1)	0.74	0.84	1.13
Th-232	0.16 (2)	+/- 0.27 (3)	0.20 (3)	0.08 (4)
Ra-226	0.28 (2)	+/- 0.14 (3)	0.24 (3)	

Notes:

1. U-238 result from sample ID 12B-35032 only. Sample 12B-35031 was rejected because the absolute value of the U-238 result was larger than the associated 2-sigma uncertainty. This is indicative of improper method blank subtraction at the analytical laboratory.
2. Grab sample activity value equal to average result from samples 12B-35031, 12B-35031DUP, and 12B-35032.
3. The highest single sample value reported.
4. The RSS assumed that all material in the Th-232/Ra-226 energy window was Th-232 during the Pilot Demonstration.

Table 10
Radiological Characteristics of Particle Size Fractions

Parent Sample ID	Date	Size Fraction Sample ID	Description (size fraction)	Th-232 (pCi/g)	Uncertainty (pCi/g)	Ra-226 (pCi/g)	Uncertainty (pCi/g)	U-238 (pCi/g)	Uncertainty (pCi/g)
12b-035860	9/14/00	12b-035876	- #100 to + #200	9.02E-01	3.15E-01	3.56E-03	9.34E-02	6.96E-01	2.59E-01
		12b-035877	- #60 to + #100	4.36E-01	2.00E-01	3.00E-02	6.74E-02	5.11E-01	2.18E-01
		12b-035878	- #40 to + #60	7.88E-01	2.93E-01	1.12E-01	9.44E-02	4.29E-01	2.04E-01
		12b-035879	- #20 to + #40	4.94E-01	2.06E-01	2.76E-01	1.31E-01	1.27E+00	4.08E-01
		12b-035880	- #10 to + #20	7.47E-01	2.69E-01	3.60E-02	7.49E-02	8.47E-01	2.84E-01
		12b-035881	- #4 to + #10	5.04E-01	1.09E-01	2.31E-01	1.39E-01	7.54E-01	2.73E-01
		12b-035882	- 3/8" to + #4	4.20E-01	1.89E-01	-2.78E-02	3.68E-02	9.19E-01	3.32E-01
		12b-035883	- 3/4" to 3/8"	4.00E-01	1.86E-01	4.40E-02	5.87E-02	5.68E-01	2.25E-01
12b-035861	10/2/00	12b-035891	- #100 to + #200	1.78E+01	3.27E+00	9.71E-01	2.88E-02	3.51E+00	8.32E-01
		12b-035892	- #60 to + #100	4.96E+00	9.75E-01	5.43E-01	1.94E-01	1.32E+00	4.16E-01
		12b-035893	- #40 to + #60	5.38E+00	1.11E+00	5.54E-01	1.95E-01	6.46E-01	2.40E-01
		12b-035894	- #20 to + #40	4.89E+00	1.03E+00	3.63E-01	1.63E-01	1.00E+00	8.56E-01
		12b-035895	- #10 to + #20	1.88E+00	5.08E-01	7.58E-01	2.60E-01	9.78E-01	3.64E-01
		12b-035896	- #4 to + #10	1.12E+00	3.97E-01	4.02E-01	1.79E-01	9.88E-01	3.38E-01
		12b-035898	- 3/8" to + #4	7.21E-01	2.53E-01	5.06E-01	2.08E-01	5.85E-01	2.57E-01
		12b-035899	- 3/4" to 3/8"	7.28E-01	3.74E-01	1.38E-01	1.93E-01	7.10E-01	3.42E-01
12b-035862	10/6/00	12b-035884	- #100 to + #200	1.38E+01	2.76E+00	3.75E-01	1.67E-01	2.91E+00	7.00E-01
		12b-035885	- #60 to + #100	4.92E+00	1.08E+00	4.18E-01	1.65E-01	8.12E-01	2.85E-01
		12b-035886	- #40 to + #60	2.15E+00	5.38E-01	1.42E-01	1.06E-01	1.07E+00	3.41E-01
		12b-035887	- #20 to + #40	4.27E+00	9.38E-01	5.07E-01	2.03E-01	6.87E-01	2.67E-01
		12b-035888	- #10 to + #20	2.08E+00	5.42E-01	4.63E-01	1.95E-01	9.34E-01	3.29E-01
		12b-035889	- 3/8" to + #4	5.65E-01	2.21E-01	3.92E-01	1.64E-01	6.92E-01	2.73E-01
		12b-035890	- #4 to + #10	1.35E+00	3.82E-01	9.91E-01	2.92E-01	9.63E-01	3.18E-01
12b-035863	10/27/00	12b-035900	- #100 to + #200	8.49E+00	1.82E+00	4.02E-01	1.78E-01	2.08E+00	5.51E-01
		12b-035901	- #60 to + #100	2.99E+00	6.95E-01	2.75E-01	1.47E-01	7.65E-01	2.91E-01
		12b-035902	- #40 to + #60	1.76E+00	4.93E-01	1.21E-01	9.65E-02	7.14E-01	3.12E-01
		12b-035903	- #20 to + #40	1.13E+00	3.31E-01	2.08E-01	1.20E-01	8.70E-01	3.41E-01
		12b-035904	- #10 to + #20	2.11E+00	5.30E-01	8.47E-01	2.67E-01	1.02E+00	3.41E-01
		12b-035905	- #4 to + #10	1.51E+00	4.43E-01	8.49E-01	2.79E-01	9.44E-01	3.50E-01
		12b-035906	- 3/8" to + #4	7.43E-01	2.77E-01	4.20E-01	2.15E-01	5.09E-01	2.14E-01

Table 11a
On-site Slug Radiological Characteristics
Ra + Th Setpoint 15 pCi/g
Uranium Setpoint 50 pCi/g

Process Stockpile ID	Grid Cell ID	Sample ID	Ra-226 (pCi/g)	MDA	Uncertainty	Th-232 (pCi/g)	MDA	Uncertainty	U-238 (pCi/g)	MDA	Uncertainty
In situ	Bucket 1-1	12b-035044	1.83	0.29	0.08828	9.13	0.24	0.18604	3.64 J	14.10	3.3232
In situ	Bucket 1-2	12b-035045	3.20	0.40	0.10552	6.88	0.38	0.14223	0.00 U	14.98	0.00
In situ	Bucket 1-3	12b-035046	2.15	0.38	0.09755	10.05	0.26	0.19264	0.00 U	14.20	0.00
In situ	Bucket 2-1	12b-035047	1.89	0.36	0.09021	10.16	0.24	0.19702	6.43 J	13.10	0.56378
In situ	Bucket 2-2	12b-035048	2.24	0.33	0.09398	10.23	0.25	0.19470	5.45 J	9.24	0.49436
In situ	Bucket 2-3	12b-035049	2.14	0.40	0.09703	10.99	0.25	0.20759	3.86	8.19	2.37769
In situ	Bucket 3-1	12b-035050	1.50	0.29	0.08218	8.80	0.26	0.18409	3.70 J	7.98	1.74795
In situ	Bucket 3-2	12b-035051	1.94	0.33	0.09155	11.08	0.25	0.20598	3.83 J	8.45	3.77683
In situ	Bucket 3-3	12b-035052	1.93	0.31	0.08761	9.22	0.25	0.18516	1.30 J	6.25	3.11436
Point #7(1)	NA(3)	12b-035056	2.24	0.38	0.10057	10.50	0.28	0.20583	0.00 U	14.50	0.00
Point #7(1)	NA(3)	12b-035058	2.34	0.38	0.10258	10.67	0.29	0.20396	3.25 J	7.93	1.80302
Point #7(1)	NA(3)	12b-035060	2.14	0.35	0.09184	10.06	0.25	0.19069	7.16 J	10.60	3.32365
G(2)	NA(3)	12b-035061	2.17	0.32	0.08716	9.80	0.24	0.18497	1.27 J	5.04	0.44358
G(2)	NA(3)	12b-035062	2.21	0.28	0.07669	7.18	0.28	0.13838	7.14 J	12.20	1.61051
G(2)	NA(3)	12b-035063	2.02	0.25	0.08186	9.51	0.24	0.17787	1.42 J	11.10	5.51580

Notes:
1. Entrance to the RSS
2. Above-criteria Stockpile
3. NA = Not Applicable

Table 11b
Slug 6-1 Radiological Characteristics
Ra + Th Setpoint 5 pCi/g
Uranium Setpoint 50 pCi/g

Process Stockpile ID	Grid Cell ID	Sample ID	Ra-226 (pCi/g)	MDA	Uncertainty	Th-232 (pCi/g)	MDA	Uncertainty	U-238 (pCi/g)	MDA	Uncertainty
In situ	G7	12b-035238	2.16	0.27	0.09803	4.25	0.18	0.10987	5.78	5.65	1.27322
In situ	G8	12b-035239	4.88	0.45	0.17070	13.14	0.31	0.24534	6.38 J	10.20	1.87
In situ	G9	12b-035240	5.27	0.48	0.18484	12.61	0.34	0.2535	9.50 J	13.00	0.46
In situ	H7	12b-035241	3.35	0.38	0.13594	14.04	0.28	0.24701	1.70 J	6.11	2.36476
In situ	H8	12b-035242	4.52	0.46	0.16864	18.05	0.32	0.31182	8.67 J	7.51	5.83751
In situ	H9	12b-035243	38.43	1.13	0.72675	114.62	0.81	1.45912	20.24 J	25.80	1.17658
In situ	I7	12b-035244	9.66	0.81	0.30308	59.00	0.57	0.81464	8.05 J	14.50	4.78369
In situ	I8	12b-035245	8.08	0.89	0.30259	75.65	0.61	1.00705	17.20 J	20.90	3.74759
In situ	I9	12b-035246	5.82	0.64	0.21399	38.99	0.44	0.55923	10.60 J	14.40	2.51685
Point #7(1)	NA(3)	12b-035250	17.68	0.78	0.41212	44.86	0.54	0.66407	10.58 J	17.30	3.20
Point #7(1)	NA(3)	12b-035253	11.09	0.51	0.27433	17.92	0.37	0.32214	6.79 J	23.60	5.03595
Point #7(1)	NA(3)	12b-035254	4.73	0.40	0.15935	12.76	0.29	0.23945	5.90 J	8.41	2.03015
G(2)	NA(3)	12b-035255	19.63	0.74	0.42420	44.76	0.55	0.65261	3.46 J	12.00	5.78170
G(2)	NA(3)	12b-035256	18.83	0.60	0.38287	26.09	0.45	0.41768	10.05 J	20.40	2.72326
G(2)	NA(3)	12b-035257	5.33	0.40	0.16842	14.29	0.30	0.2534	2.70 J	14.20	5.00038

Notes:
1. Entrance to the RSS
2. Above-Criteria Stockpile
3. NA = Not Applicable

Table 11c
Slug 6-2 Radiological Characteristics
Ra + Th Setpoint 24 pCi/g
Uranium Setpoint Not Applicable

Process Stockpile ID	Grid Cell ID	Sample ID	Ra-226 (pCi/g)	MDA	Uncertainty	Th-232 (pCi/g)	MDA	Uncertainty	U-238 (pCi/g)	MDA	Uncertainty
In situ	EE15	12b-035341	4.29	0.51	0.14532	23.99	0.38	0.36827	3.65 J	9.47	3.81884
In situ	EE16	12b-035342	4.74	0.41	0.13664	22.48	0.44	0.32261	1.33 J	11.60	5.06
In situ	EE17	12b-035343	4.85	0.49	0.14864	23.71	0.35	0.37186	4.07 J	14.40	3.80
In situ	FF15	12b-035344	4.54	0.48	0.14462	22.34	0.35	0.35411	11.79 J	14.00	2.52310
In situ	FF16	12b-035345	4.96	0.49	0.14376	19.36	0.45	0.30658	5.39 J	9.35	2.53790
In situ	FF17	12b-035346	4.35	0.38	0.12741	22.22	0.35	0.34222	3.03 J	12.00	3.20214
In situ	GG15	12b-035347	4.66	0.48	0.14416	24.08	0.35	0.37337	10.15 J	16.20	2.33430
In situ	GG16	12b-035348	3.85	0.48	0.13113	23.30	0.35	0.35676	7.8 J	16.80	2.42335
In situ	GG17	12b-035349	4.28	0.49	0.13667	21.73	0.35	0.34265	5.53 J	12.60	2.06080
Point #7(1)	NA(4)	12b-035378	4.22	0.45	0.12670	20.86	0.35	0.31621	0.00 U	17.40	0.00
Point #7(1)	NA(4)	12b-035379	3.23	0.42	0.13558	20.41	0.30	0.32101	8.35 J	12.70	1.83374
Point #7(1)	NA(4)	12b-035380	4.11	0.39	0.13112	24.25	0.35	0.37673	1.95 UJ	8.97	5.74510
G(2)	NA(4)	12b-035383	3.92	0.38	0.12412	21.06	0.31	0.32695	5.52 J	18.00	3.22929
G(2)	NA(4)	12b-035384	3.96	0.40	0.12762	22.58	0.36	0.35064	3.84 J	9.58	4.35422
G(2)	NA(4)	12b-035385	4.39	0.47	0.13457	22.78	0.34	0.34815	9.24 J	14.10	2.30119
G(2)	NA(4)	12b-035386	3.54	0.43	0.13614	19.77	0.29	0.30679	0.00 U	6.81	0.00
H(3)	NA(4)	12b-035387	3.81	0.37	0.11990	20.95	0.33	0.32443	2.93 J	8.71	4.25798

Notes:
1. Entrance to the RSS
2. Above-criteria Stockpile
3. Below-criteria Stockpile
4. NA = Not Applicable

Table 11d
Slug 6-3 Radiological Characteristics
Ra + Th Setpoint 5 pCi/g
Uranium Setpoint 50 pCi/g

Process Stockpile ID	Grid Cell ID	Sample ID	Ra-226 (pCi/g)	MDA	Uncertainty	Th-232 (pCi/g)	MDA	Uncertainty	U-238 (pCi/g)	MDA	Uncertainty
In situ	DD5	12b-035617	2.12	0.30	0.08511	4.91	0.21	0.11616	0.91 J	15.90	4.54933
In situ	DD6	12b-035618	1.68	0.25	0.08159	4.28	0.21	0.11476	3.02 J	5.33	2.75188
In situ	DD7	12b-035619	2.31	0.34	0.10339	5.99	0.24	0.14877	1.72 J	13.10	3.12306
In situ	EE5	12b-035620	3.22	0.54	0.15209	9.10	0.37	0.23118	18.34 J	20.10	8.07501
In situ	EE6	12b-035621	2.70	0.30	0.10679	6.29	0.25	0.13731	0.57 J	5.17	1.31962
In situ	EE7	12b-035622	2.01	0.29	0.08821	4.07	0.20	0.10882	5.29 J	7.94	1.34959
In situ	FF5	12b-035623	1.92	0.23	0.08031	4.30	0.19	0.10661	0.00 U	9.84	0
In situ	FF6	12b-035624	3.08	0.37	0.11881	6.37	0.26	0.15535	3.54 J	10.60	1.67482
In situ	FF7	12b-035625	2.21	0.24	0.09064	3.56	0.19	0.10072	3.34 J	7.25	1.19121
Point #7(1)	NA(3)	12b-035629	2.95	0.33	0.11055	7.67	0.24	0.16798	2.20 J	14.90	0.29505
Point #7(1)	NA(3)	12b-035630	2.33	0.34	0.11685	7.60	0.23	0.16641	0.81 J	5.47	2.62803
Point #7(1)	NA(3)	12b-035631	3.07	0.27	0.11393	6.29	0.25	0.15550	0.58 J	7.64	0.46947
G(2)	NA(3)	12b-035635	2.75	0.30	0.10235	6.70	0.23	0.14632	1.07 J	6.15	1.56625
G(2)	NA(3)	12b-035636	2.50	0.25	0.09986	6.35	0.23	0.14755	0.00 U	13.20	0
G(2)	NA(3)	12b-035637	1.90	0.32	0.09861	5.27	0.20	0.13041	5.94 J	8.67	1.31789
G(2)	NA(3)	12b-035638	2.78	0.35	0.10562	7.96	0.24	0.16815	0.48 J	16.80	3.51688
G(2)	NA(3)	12b-035639	3.01	0.36	0.11371	8.23	0.25	0.17319	10.01 J	13.40	0.47952

Notes:
1. Entrance to the RSS
2. Above-criteria Stockpile
3. NA = Not Applicable

Table 11e
Slug 7-1 Radiological Characteristics
Ra + Th Setpoint 10 pCi/g
Uranium Setpoint Not Applicable

Process Stockpile ID	Grid Cell ID	Sample ID	Ra-226 (pCi/g)	MDA	Uncertainty	Th-232 (pCi/g)	MDA	Uncertainty	U-238 (pCi/g)	MDA	Uncertainty
In situ	HH28	12b-035316	3.44	0.37	0.12002	18.60	0.33	0.30600	5.85 J	16.50	4.13304
In situ	HH29	12b-035317	3.80	0.36	0.12670	20.17	0.34	0.33052	7.89 J	11.70	1.55038
In situ	HH30	12b-035318	4.69	0.45	0.15381	23.58	0.38	0.38539	7.33 J	14.50	0.85062
In situ	II28	12b-035319	3.79	0.38	0.12242	20.47	0.33	0.32040	8.49 J	15.50	2.37433
In situ	II29	12b-035320	5.51	0.52	0.16203	26.24	0.38	0.40228	6.19 J	17.00	4.43766
In situ	II30	12b-035321	4.59	0.47	0.14176	20.78	0.33	0.33016	8.93 J	15.60	2.29034
In situ	JJ28	12b-035322	3.42	0.44	0.12043	19.24	0.31	0.30292	10.29	13.10	2.03733
In situ	JJ29	12b-035323	5.10	0.47	0.15199	24.82	0.37	0.37921	0.00 U	19.50	0
In situ	JJ30	12b-035324	4.83	0.37	0.14248	21.91	0.34	0.33346	1.15 J	8.78	3.71099
Point #7(1)	NA(3)	12b-035353	6.77	0.44	0.16487	21.77	0.45	0.32766	13.70 J	16.80	4.18141
Point #7(1)	NA(3)	12b-035354	4.64	0.46	0.15813	22.89	0.31	0.35409	5.74 J	15.10	4.54586
Point #7(1)	NA(3)	12b-035355	5.80	0.39	0.15895	26.66	0.37	0.4	9.24 J	16.00	2.02895
Point #7(1)	NA(3)	12b-035356	6.21	0.42	0.17059	27.79	0.41	0.40535	0.00	12.20	0
G(2)	NA(3)	12b-035358	5.79	0.45	0.15925	25.63	0.38	0.38519	5.94 J	18.90	5.66158
G(2)	NA(3)	12b-035359	5.15	0.45	0.14569	22.25	0.35	0.33571	3.74 J	8.76	1.94385
G(2)	NA(3)	12b-035360	4.99	0.45	0.14180	22.59	0.34	0.33582	7.35 J	14.50	2.19702
G(2)	NA(3)	12b-035362	5.60	0.40	0.14763	21.69	0.42	0.32484	4.84 J	12.10	2.19686

Notes:
1. Entrance to the RSS
2. Above-criteria Stockpile
3. NA = Not Applicable

Table 11f
Slug 7-2 Radiological Characteristics
Ra + Th Setpoint 5 pCi/g
Uranium Setpoint Not Applicable

Process Stockpile ID	Grid Cell ID	Sample ID	Ra-226 (pCi/g)	MDA	Uncertainty	Th-232 (pCi/g)	MDA	Uncertainty	U-238 (pCi/g)	MDA	Uncertainty
In situ	P8	12b-035421				1.05	0.11	0.04367	1.24 J	3.95	1.39597
In situ	P9	12b-035422	1.11	0.18	0.05162	1.20	0.12	0.03998	1.66 J	7.10	1.71887
In situ	P10	12b-035423	0.87	0.17	0.05240	1.14	0.11	0.04384	2.31 UJ	2.89	1.87740
In situ	Q8	12b-035424	0.76	0.15	0.05215	1.05	0.10	0.04314	0.13 J	2.31	1.17036
In situ	Q9	12b-035425	0.75	0.18	0.05341	1.01	0.11	0.04401	3.26 UJ	2.32	6.07337
In situ	Q10	12b-035426	0.95	0.17	0.04932	1.15	0.11	0.03947	3.21 R	4.37	0.67617
In situ	R8	12b-035427	1.61	0.27	0.08512	6.05	0.18	0.12891	0.78 UJ	4.01	2.65500
In situ	R9	12b-035428	0.92	0.17	0.05759	1.33	0.12	0.04963	0.91 J	7.45	3.22281
In situ	R10	12b-035429	0.86	0.14	0.05257	1.18	0.10	0.04708	0.35 J	7.24	2.16182
Point #7(1)	NA(3)	12b-035434	1.10	0.17	0.04970	1.68	0.12	0.04798	0.04 UJ	2.64	2.02656
Point #7(1)	NA(3)	12b-035435	1.17	0.16	0.06116	1.71	0.12	0.05842	7.25 J	7.84	2.88690
Point #7(1)	NA(3)	12b-035436	1.12	0.18	0.06119	1.95	0.12	0.06148	0.31 J	2.84	1.19599
Point #7(1)	NA(3)	12b-035437	0.98	0.19	0.06186	2.03	0.13	0.06417	1.17 J	3.49	1.13701
H(2)	NA(3)	12b-035440	1.06	0.08	0.06327	2.03	0.12	0.06611	0.58 J	2.84	1.69346
H(2)	NA(3)	12b-035441	0.98	0.19	0.05959	1.65	0.12	0.05688	2.48 J	3.34	0.61683
H(2)	NA(3)	12b-035442	0.99	0.21	0.06184	2.18	0.13	0.06690	2.19 J	4.68	0.84674
H(2)	NA(3)	12b-035443	1.14	0.17	0.06536	1.72	0.13	0.06129	2.51 J	4.15	0.81014

Notes:
1. Entrance to the RSS
2. Below-criteria Stockpile
3. NA = Not Applicable

Table 11g
Slug 7-3 Radiological Characteristics
Ra + Th Setpoint 5 pCi/g
Uranium Setpoint 50 pCi/g

Process Stockpile ID	Grid Cell ID	Sample ID	Ra-226 (pCi/g)	MDA	Uncertainty	Th-232 (pCi/g)	MDA	Uncertainty	U-238 (pCi/g)	MDA	Uncertainty
In situ	T5	12b-035496	1.19	0.23	0.07638	1.45	0.15	0.06370	0.79 J	4.24	1.78028
In situ	T6	12b-035497	1.16	0.24	0.06500	2.14	0.14	0.06635	2.31 J	4.16	1.08894
In situ	T7	12b-035498	1.89	0.57	0.18558	2.88	0.41	0.15832	1.70 J	11.60	4.73938
In situ	U5	12b-035499	0.92	0.20	0.06142	1.41	0.13	0.05468	3.41 J	3.97	0.80632
In situ	U6	12b-035500	0.91	0.21	0.06305	1.23	0.13	0.05210	0.73 J	2.83	1.22865
In situ	U7	12b-035501	1.46	0.28	0.09965	2.09	0.19	0.08644	7.52	7.07	1.37187
In situ	V5	12b-035502	1.05	0.18	0.05872	1.37	0.12	0.04737	1.90 J	3.91	0.60315
In situ	V6	12b-035503	0.96	0.23	0.06813	1.79	0.15	0.06441	2.70 J	4.90	0.88089
In situ	V7	12b-035504	1.25	0.32	0.09815	1.66	0.19	0.07864	0.72 J	11.50	2.57530
Point #7[1]	NA[3]	12b-035508	3.96	0.48	0.16735	13.44	0.33	0.26095	6.69 J	11.60	2.11288
Point #7[1]	NA[3]	12b-035509	1.09	0.21	0.06671	2.30	0.13	0.06940	2.86 J	6.37	0.84475
Point #7[1]	NA[3]	12b-035510	1.06	0.18	0.06310	1.61	0.13	0.05774	2.71 J	2.82	0.54274
Point #7[1]	NA[3]	12b-035518	0.88	0.18	0.05953	1.44	0.13	0.05515	2.83 J	3.36	0.91934
H[2]	NA[3]	12b-035513	2.31	0.33	0.10146	5.45	0.23	0.12833	5.12 J	6.72	1.22583
H[2]	NA[3]	12b-035514	1.17	0.22	0.06996	2.88	0.15	0.08228	1.58 J	9.00	2.70678
H[2]	NA[3]	12b-035515	1.24	0.23	0.07223	2.72	0.14	0.07910	3.94 J	4.64	0.93716
H[2]	NA[3]	12b-035516	1.12	0.21	0.06495	2.24	0.14	0.06676	5.47 J	3.02	3.26528
H[2]	NA[3]	12b-035517	1.15	0.24	0.07289	2.67	0.13	0.08013	2.16 J	5.50	0.87484

Notes:
1. Entrance to the RSS
2. Below-criteria Stockpile
3. NA = Not Applicable

Table 11h
Slug 7-4 Radiological Characteristics
Ra + Th Setpoint 5 pCi/g – Uranium Setpoint 50 pCi/g

Process Stockpile ID	Grid Cell ID	Sample ID	Ra-226 (pCi/g)	MDA	Uncertainty	Th-232 (pCi/g)	MDA	Uncertainty	U-238 (pCi/g)	MDA	Uncertainty
In situ	T11	12b-035531	1.45	0.24	0.08070	***	0.17	0.10271	3.33 J	6.13	1.09247
In situ	T12	12b-035532	1.21	0.30	0.08460	2.51	0.17	0.08449	0.00 U	3.85	0
In situ	T13	12b-035533	0.86	0.20	0.06010	1.78	0.12	0.06349	3.65 J	5.48	0.81012
In situ	U11	12b-035534	1.33	0.24	0.07744	3.85	0.18	0.09984	2.64 J	5.60	0.92780
In situ	U12	12b-035535	1.11	0.19	0.06515	1.52	0.13	0.05504	2.31 J	3.59	0.84915
In situ	U13	12b-035536	2.47	0.36	0.10811	11.23	0.25	0.20728	2.00 J	7.89	3.17781
In situ	V11	12b-035537	1.45	0.29	0.09125	3.95	0.19	0.11072	8.86 J	8.92	1.38980
In situ	V12	12b-035538	1.09	0.17	0.06522	1.96	0.13	0.06518	2.75 J	4.02	0.89381
In situ	V13	12b-035539	1.04	0.17	0.06057	1.62	0.12	0.05844	1.92 J	7.52	2.15606
Point #7[(1)]	NA[(4)]	12b-035552	3.02	0.27	0.10331	***	***	***	2.55 J	10.60	2.62734
Point #7[(1)]	NA[(4)]	12b-035553	2.68	0.34	0.10081	7.10	0.24	0.15245	1.64 J	5.89	2.49364
Point #7[(1)]	NA[(4)]	12b-035554	2.09	0.31	0.08965	5.82	0.22	0.13342	3.06 J	6.94	1.43548
H[(2)]	NA[(4)]	12b-035557	2.08	0.27	0.08619	5.59	0.21	0.13004	0.74 J	5.15	2.90218
H[(2)]	NA[(4)]	12b-035558	2.62	0.33	0.10332	6.05	0.23	0.13946	4.82 J	11.30	1.41149
H[(2)]	NA[(4)]	12b-035559	2.28	0.24	0.08799	5.55	0.21	0.13030	2.54 J	7.15	1.21691
H[(2)]	NA[(4)]	12b-035560	2.60	0.31	0.09821	6.73	0.24	0.14767	2.38 J	8.25	1.82355
H[(2)]	NA[(4)]	12b-035561	2.27	0.25	0.08571	5.88	0.21	0.12945	2.89 J	10.60	0.19991
H[(2)]	NA[(4)]	12b-035562	2.32	0.32	0.09589	6.52	0.22	0.14589	0.73 J	5.72	3.27972
H[(2)]	NA[(4)]	12b-035563	2.35	0.29	0.09569	6.16	0.23	0.13931	5.17 J	12.00	0.38866
H[(2)]	NA[(4)]	12b-035564	2.69	0.34	0.10511	6.59	0.23	0.14493	5.56 UJ	5.66	4.79405
G[(3)]	NA[(4)]	12b-035565	1.78	0.26	0.09565	4.63	0.20	0.11571	5.04 J	7.65	1.1714
G[(3)]	NA[(4)]	12b-035566	1.78	0.28	0.09429	5.47	0.20	0.12778	6.26 J	8.62	1.21106
G[(3)]	NA[(4)]	12b-035567	2.31	0.25	0.09591	5.92	0.20	0.13195	1.86 UJ	4.51	3.77038
G[(3)]	NA[(4)]	12b-035568	2.02	0.24	0.09220	5.30	0.19	0.12399	5.59 J	9.31	0.47312
G[(3)]	NA[(4)]	12b-035569	2.04	0.30	0.09754	5.81	0.19	0.13140	4.37 J	6.38	1.11535
G[(3)]	NA[(4)]	12b-035570	1.90	0.25	0.08918	5.27	0.19	0.11944	2.51 J	5.56	1.30632

1. Entrance to the RSS
2. Below-criteria Stockpile
3. Above-criteria Stockpile
4. NA = Not Applicable

Table 11i
Slug 8-1 Radiological Characteristics
Ra + Th Setpoint 5.68 pCi/g
Uranium Setpoint Not Applicable

Process Stockpile ID	Grid Cell ID	Sample ID	Ra-226 (pCi/g)	MDA	Uncertainty	Th-232 (pCi/g)	MDA	Uncertainty	U-238 (pCi/g)	MDA	Uncertainty
In situ	N19	12b-035162	1.17	0.21	0.06852	4.55	0.15	0.10662	0.78 J	3.71	1.89011
In situ	N20	12b-035163	2.22	0.33	0.10740	9.93	0.22	0.18778	8.91 J	11.10	1.67619
In situ	N21	12b-035164	9.84	1.50	0.47866	248.38	1.06	2.91295	17.60 J	30.20	3.04483
In situ	O19	12b-035165	1.64	0.27	0.07917	5.76	0.17	0.12204	2.25 J	5.39	1.05367
In situ	O20	12b-035166	2.37	0.35	0.10886	10.09	0.23	0.18869	3.22 J	9.54	1.28671
In situ	O21	12b-035167	14.90	0.85	0.37559	83.57	0.62	1.07014	18.04	15.50	5.76997
In situ	P19	12b-035168	1.13	0.18	0.06318	1.94	0.12	0.06265	1.22 UJ	3.60	2.60827
In situ	P20	12b-035169	1.65	0.28	0.09102	7.61	0.18	0.15250	2.16 J	12.30	3.55453
In situ	P21	12b-035170	12.84	0.72	0.32114	58.89	0.53	0.78273	16.95 J	22.00	3.04669
Point #7(1)	NA(3)	12b-035173	5.26	0.69	0.21882	54.51	0.48	0.72989	5.51 J	14.90	2.57686
Point #7(1)	NA(3)	12b-035176	5.85	0.78	0.24833	73.29	0.59	0.95299	24.83 J	12.50	9.77233
Point #7(1)	NA(3)	12b-035177	7.49	0.77	0.26392	64.39	0.55	0.85458	8.96 J	22.60	2.47541
G(2)	NA(3)	12b-035178	6.71	0.63	0.22308	47.31	0.46	0.64556	8.29 J	18.10	3.08296
G(2)	NA(3)	12b-035179	5.93	0.77	0.27679	94.13	0.66	1.15431	12.05 J	16.30	3.32461
G(2)	NA(3)	12b-035180	6.70	0.70	0.24329	59.61	0.51	0.78826	1.01 J	11.40	3.25979

Notes:
1. Entrance to the RSS
2. Above-criteria Stockpile
3. NA = Not Applicable

Table 11j
Slug 8-2 Radiological Characteristics
Ra + Th Setpoint 5.68 pCi/g
Uranium Setpoint Not Applicable

Process Stockpile ID	Grid Cell ID	Sample ID	Ra-226 (pCi/g)	MDA	Uncertainty	Th-232 (pCi/g)	MDA	Uncertainty	U-238 (pCi/g)	MD A	Uncertainty
In situ	C4	12b-035200	2.85	0.33	0.12281	4.88	0.22	0.13088	4.75 J	7.36	1.47603
In situ	C5	12b-035201	5.34	0.46	0.17370	12.82	0.31	0.24180	2.96 UJ	6.71	4.36985
In situ	C6	12b-035202	3.20	0.43	0.14672	5.90	0.27	0.15780	9.53 J	12.20	1.81371
In situ	D4	12b-035203	2.64	0.40	0.12493	6.88	0.24	0.16298	4.98 J	8.22	1.80876
In situ	D5	12b-035204	3.19	0.37	0.13294	9.66	0.25	0.19546	3.32 J	10.40	1.40310
In situ	D6	12b-035205	3.37	0.37	0.13850	7.10	0.23	0.15967	2.59 J	14.30	3.04007
In situ	E4	12b-035206	5.89	0.74	0.27076	15.15	0.49	0.35023	19.40 J	23.30	4.03768
In situ	E5	12b-035207	2.94	0.34	0.13537	5.17	0.24	0.14379	7.30 J	10.70	1.59178
In situ	E6	12b-035208	1.98	0.34	0.10024	3.83	0.26	0.10919	4.43 J	6.53	2.09089
Point #7(1)	NA(3)	12b-035215	3.04	0.36	0.13550	6.50	0.23	0.15835	6.38 J	9.54	1.39723
Point #7(1)	NA(3)	12b-035216	3.81	0.37	0.14569	7.87	0.27	0.17581	7.43 J	12.70	1.83353
Point #7(1)	NA(3)	12b-035217	3.98	0.40	0.14708	7.13	0.26	0.16636	3.61 UJ	7.11	5.70439
G(2)	NA(3)	12b-035220	4.04	0.34	0.14784	8.36	0.25	0.18332	4.94 J	16.20	3.52319
G(2)	NA(3)	12b-035221	3.61	0.33	0.13140	6.74	0.24	0.15190	2.20 J	5.15	2.44829
G(2)	NA(3)	12b-035222	3.17	0.35	0.13031	6.81	0.23	0.15676	9.42 J	5.05	3.67872

Notes:
1. Entrance to the RSS
2. Above-criteria Stockpile
3. NA = Not Applicable

Table 11k
Slug 8-3 Radiological Characteristics
Ra + /Th Setpoint 24 pCi/g
Uranium Setpoint Not Applicable

Process Stockpile ID	Grid Cell ID	Sample ID	Ra-226 (pCi/g)	MDA	Uncertainty	Th-232 (pCi/g)	MDA	Uncertainty	U-238 (pCi/g)	MDA	Uncertainty
In situ	DD21	12b-035327	4.00	0.38	0.12493	18.25	0.46	0.29447	3.11 U	18.90	5.38493
In situ	DD22	12b-035328	1.75	0.26	0.08358	7.50	0.26	0.16205	0.75 J	6.21	0.56606
In situ	DD23	12b-035329	4.39	0.51	0.14380	23.77	0.35	0.36492	4.32 J	17.90	5.30384
In situ	EE21	12b-035333	3.86	0.46	0.13166	18.99	0.41	0.29828	5.81 J	14.90	0.74074
In situ	EE22	12b-035334	3.65	0.37	0.12578	21.15	0.36	0.33503	4.25 J	16.60	4.21268
In situ	EE23	12b-035335	4.28	0.55	0.15523	23.32	0.41	0.38594	9.58 J	12.80	4.99485
In situ	FF21	12b-035336	3.29	0.43	0.11877	19.37	0.32	0.31177	9.51 J	15.40	2.21133
In situ	FF22	12b-035337	3.94	0.40	0.13097	23.08	0.35	0.35821	7.10 J	15.60	4.04661
In situ	FF23	12b-035338	3.97	0.37	0.12870	22.50	0.36	0.35840	0.00 U	19.60	0
Point #7(1)	NA(3)	12b-035364	3.26	0.38	0.11233	17.77	0.31	0.28071	6.71 J	11.30	6.43025
Point #7(1)	NA(3)	12b-035365	3.15	0.40	0.13198	17.54	0.27	0.28680	3.91 J	10.30	1.58780
Point #7(1)	NA(3)	12b-035366	3.67	0.39	0.12623	21.35	0.36	0.34109	8.32 J	11.40	1.31541
Point #7(1)	NA(3)	12b-035372	3.20	0.41	0.13774	17.66	0.27	0.28839	3.02 J	11.30	3.76274
H(2)	NA(3)	12b-035368	4.07	0.46	0.13278	21.13	0.35	0.32747	7.46 UJ	10.30	6.33762
H(2)	NA(3)	12b-035369	3.95	0.32	0.11531	17.86	0.36	0.28379	10.71 J	8.36	4.17595
H(2)	NA(3)	12b-035370	3.01	0.36	0.11492	14.85	0.26	0.24204	4.22 J	8.12	1.36533
H(2)	NA(3)	12b-035371	3.59	0.42	0.12071	19.09	0.33	0.29223	5.15 J	13.40	1.96322
H(2)	NA(3)	12b-035373	2.85	0.42	0.12868	16.70	0.28	0.27386	4.04 J	8.28	1.68807
H(2)	NA(3)	12b-035374	4.19	0.35	0.12154	17.67	0.41	0.28042	6.52 J	19.00	2.46009

Notes:
1. Entrance to the RSS
2. Below-criteria Stockpile
3. NA = Not Applicable

Table 11l
Slug 8-4 Radiological Characteristics
Ra + Th Setpoint 5 pCi/g
Uranium Setpoint 50 pCi/g

Process Stockpile ID	Grid Cell ID	Sample ID	Ra-226 (pCi/g)	MDA	Uncertainty	Th-232 (pCi/g)	MDA	Uncertainty	U-238 (pCi/g)	MDA	Uncertainty
In situ	T8	12b-035520	1.32	0.21	0.07781	2.48	0.15	0.08005	1.12 J	3.42	1.83523
In situ	T9	12b-035521	1.50	0.32	0.09074	3.97	0.18	0.10655	6.53 J	8.94	1.45134
In situ	T10	12b-035522	1.46	0.57	0.15978	3.02	0.35	0.15657	8.50 J	10.10	1.99861
In situ	U8	12b-035523	1.33	0.31	0.07538	1.54	0.19	0.05488	5.39 UJ	3.83	10.24294
In situ	U9	12b-035524	3.26	0.32	0.10573	8.30	0.22	0.16798	2.81 J	11.90	2.65211
In situ	U10	12b-035525	1.29	0.19	0.07089	2.40	0.14	0.07611	1.90 J	9.20	3.30472
In situ	V8	12b-035526	1.75	0.33	0.10515	3.50	0.20	0.10924	3.10 J	10.20	2.44565
In situ	V9	12b-035527	2.44	0.33	0.09611	6.33	0.21	0.14004	4.67 J	7.13	1.38270
In situ	V10	12b-035528	1.72	0.33	0.10668	4.76	0.22	0.13978	1.70 UJ	5.20	4.16223
Point #7 (1)	NA(3)	12b-035542	1.41	0.22	0.06223	2.21	0.14	0.06242	1.50 J	3.53	0.53526
Point #7 (1)	NA(3)	12b-035543	1.21	0.28	0.07337	2.45	0.14	0.07705	2.14 UJ	3.47	3.83487
Point #7 (1)	NA(3)	12b-035544	1.30	0.18	0.07262	2.21	0.15	0.07252	3.61 J	4.41	0.90835
H (2)	NA(3)	12b-035547	1.62	0.21	0.07714	3.79	0.16	0.09616	1.83 J	5.21	1.56840
H (2)	NA(3)	12b-035548	1.01	0.21	0.06430	2.16	0.14	0.06662	4.33 J	7.85	1.93327
H (2)	NA(3)	12b-035549	1.27	0.20	0.07140	3.34	0.15	0.08957	1.70 J	4.25	1.26359
H (2)	NA(3)	12b-035550	1.39	0.24	0.07522	2.21	0.14	0.07096	2.26 UJ	3.21	4.46272
H (2)	NA(3)	12b-035551	1.55	0.18	0.07478	2.31	0.13	0.07137	5.25 J	6.67	1.01784

Notes:
1. Entrance to the RSS
2. Below-criteria Stockpile
3. NA = Not Applicable

Table 11m
Engineering Slug #1 Radiological Characteristics
Ra + Th Setpoint 13.75 pCi/g
Uranium Setpoint Not Applicable

Process Stockpile ID	Grid Cell ID	Sample ID	Ra-226 (pCi/g)	MDA	Uncertainty	Th-232 (pCi/g)	MDA	Uncertainty	U-238 (pCi/g)	MDA	Uncertainty
In situ	SAND 1	12b-035464	0.41	0.15	0.04168	1.67	0.10	0.05283	2.55 J	5.04	0.16439
In situ	SAND 2	12b-035465	0.47	0.17	0.04615	1.32	0.10	0.04975	1.98 UJ	2.38	2.57393
In situ	SAND 3	12b-035466	0.51	0.20	0.04969	1.53	0.12	0.05618	2.75 J	5.58	0.70815
In situ	G1	12b-035469	6.00	0.61	0.21097	34.54	0.40	0.51219	10.09 J	17.30	2.37192
In situ	G2	12b-035470	6.82	0.57	0.20007	30.82	0.39	0.45984	8.27 J	16.40	2.34212
In situ	G3	12b-035471	5.60	0.57	0.19654	29.70	0.38	0.45528	12.07 J	18.00	2.81834
Point #7(1)	NA(4)	12b-035474	5.33	0.48	0.18257	25.40	0.35	0.39691	12.06 J	21.80	4.90024
Point #7(1)	NA(4)	12b-035475	1.53	0.30	0.08938	7.01	0.21	0.14612	3.31 J	6.65	1.15819
Point #7(1)	NA(4)	12b-035476	2.66	0.39	0.11901	12.88	0.24	0.22743	2.31 UJ	5.76	4.29094
Point #7(1)	NA(4)	12b-035477	4.72	0.51	0.17428	26.02	0.35	0.40247	7.43 J	11.90	2.14016
G(2)	NA(4)	12b-035479	4.45	0.44	0.14890	21.22	0.30	0.33120	5.82 J	11.20	1.79762
G(2)	NA(4)	12b-035480	4.16	0.42	0.15078	18.15	0.31	0.29697	3.93 J	15.70	5.83909
G(2)	NA(4)	12b-035483	2.93	0.38	0.12690	14.44	0.26	0.25322	9.32 J	6.00	3.57664
G(2)	NA(4)	12b-035485	4.01	0.47	0.16262	20.07	0.33	0.32178	7.09 J	13.20	2.01160
H(3)	NA(4)	12b-035481	2.82	0.34	0.11992	13.79	0.27	0.23811	5.11 J	5.76	3.12630
H(3)	NA(4)	12b-035481	2.59	0.36	0.11610	12.92	0.25	0.20355	0.68	5.94	3.47340
H(3)	NA(4)	12b-035482	2.25	0.34	0.10918	11.06	0.24	0.20477	3.83 J	8.02	1.23810
H(3)	NA(4)	12b-035484	2.66	0.39	0.12230	13.45	0.26	0.23192	3.86 UJ	5.91	4.60371

Notes:
1. Entrance to the RSS
2. Above-criteria Stockpile
3. Below-criteria Stockpile
4. NA = Not Applicable

Table 12
Slug Weight Separations

GSS						RSS		Total Oversize (tons)	% Total Oversize
Slug	Total Weight (tons)	+6" (tons)	% +6"	+3/8" to 6" (tons)	% 3/8" to 6"	-3/8" (tons)	% -3/8"		
On-Site	7.92	0.54	6.82	1.52	19.19	5.9	73.99	2.1	26.01
Engineered	16.3	0	0.00	0	0.00	16.3	100.00	0.0	0.00
6-1	30.11	2.56	8.50	12.65	42.01	14.9	49.49	15.2	50.51
6-2	19.9	0.6	3.02	7.8	39.20	11.5	57.79	8.4	42.21
6-3	30.84	0.54	1.75	9.63	31.23	20.7	67.02	10.2	32.98
7-1	20.9	0.3	1.44	5.6	26.79	15.0	71.77	5.9	28.23
7-2	23.3	0.6	2.58	8.9	38.20	13.8	59.23	9.5	40.77
7-3	27.9	0.4	1.43	13	46.59	14.5	51.97	13.4	48.03
7-4	30.6	0.6	1.96	10.5	34.31	19.5	63.73	11.1	36.27
8-1	10.15	0	0.00	3.04	29.95	7.1	70.05	3.0	29.95
8-2	9.32	0	0.00	2.03	21.78	7.3	78.22	2.0	21.78
8-3	21.6	0.4	1.85	11.1	51.39	10.1	46.76	11.5	53.24
8-4	28.7	1.2	4.18	11	38.33	16.5	57.49	12.2	42.51
Totals	**277.5**	**7.7**	**2.79**	**96.8**	**34.87**	**173.0**	**62.34**	**104.5**	**37.66**

Table 13
Batch Weight Separation

	GSS					RSS		Total Oversize (tons)	% Total Oversize (tons)
Batch	Total Weight	+6" (tons)	% +6"	+3/8 to 6" (tons)	% +3/8 to 6”	-3/8"	% -3/8"		
1	38.7	1.2	3.05	10.4	26.94	27.1	70.01	11.6	29.99
1-1	147.7	0.0	0.00	48.7	32.94	99.0	67.06	48.7	32.94
	128.0	0.0	0.00	40.5	31.67	87.5	68.33	40.5	31.67
	172.1	0.0	0.00	56.4	32.74	115.8	67.26	56.4	32.74
	88.1	4.5	5.07	29.7	33.75	53.9	61.18	34.2	38.82
	205.1	0.0	0.00	70.7	34.47	134.4	65.53	70.7	34.47
1-2	79.5	1.9	2.33	41.7	52.43	36.0	45.24	43.5	54.76
1-3	127.0	0.0	0.00	48.4	38.11	78.6	61.89	48.4	38.11
1-4	52.3	0.0	0.00	15.9	30.39	36.4	69.61	15.9	30.39
1-5	174.5	0.2	0.09	48.3	27.69	126.0	72.21	48.5	27.79
2	56.1	0.6	1.06	14.4	25.57	41.2	73.37	15.0	26.63
3	142.8	0.6	0.42	31.2	21.83	111.1	77.75	31.8	22.25
4	58.6	0.0	0.00	14.0	23.82	44.6	76.18	14.0	23.82
5	101.7	0.0	0.00	28.8	28.31	72.9	71.69	28.8	28.31
6-1	119.6	5.0	4.18	21.1	17.63	93.5	78.19	26.1	21.81
	41.9	1.6	3.92	8.9	21.10	31.4	74.97	10.5	25.03
	105.5	15.0	14.17	27.1	25.71	63.4	60.12	42.1	39.88
6-5	253.0	10.9	4.31	69.1	27.31	173.0	68.38	80.0	31.62
6-6	191.7	1.9	0.99	62.8	32.76	127.0	66.25	64.7	33.75
7	170.8	0.0	0.00	59.3	34.72	111.5	65.28	59.3	34.72
7-1	84.7	0.7	0.83	27.3	32.23	56.7	66.94	28.0	33.06
	174.5	2.3	1.32	66.9	38.34	105.3	60.34	69.2	39.66
7-4	115.2	3.1	2.65	44.2	38.39	67.9	58.96	47.3	41.04
7-5	197.0	1.5	0.74	77.2	39.18	118.3	60.08	78.6	39.92
7-6	227.5	12.5	5.49	108.8	47.82	106.2	46.68	121.3	53.32
8	142.6	0.0	0.00	44.8	31.44	97.8	68.56	44.8	31.44
8-1	132.9	0.0	0.00	35.2	26.51	97.7	73.49	35.2	26.51
	99.0	0.0	0.00	25.3	25.52	73.8	74.48	25.3	25.52
	39.6	0.0	0.00	7.5	18.98	32.1	81.02	7.5	18.98
8-2	109.5	1.0	0.88	39.7	36.28	68.8	62.84	40.7	37.16
	191.4	45.5	23.77	12.7	6.61	133.3	69.62	58.2	30.38
8-3	95.1	3.3	3.47	27.0	28.39	64.8	68.14	30.3	31.86
	95.8	0.0	0.00	28.3	29.54	67.5	70.46	28.3	29.54
	163.7	1.9	1.15	44.5	27.17	117.4	71.68	46.4	28.32
8-5	205.4	5.3	2.58	67.2	32.72	132.9	64.70	72.5	35.30
9	108.8	0.0	0.00	38.5	35.36	70.4	64.64	38.5	35.36
FCR#1	504.4	10.3	2.04	117.4	23.28	376.7	74.68	127.7	25.32
FCR#2	138.9	3.4	2.45	36.3	26.13	99.2	71.42	39.7	28.58
FCR#3	476.8	11.4	2.39	130.1	27.29	335.3	70.32	141.5	29.68
FCR#4	749.5	14.7	1.96	332.5	44.36	402.3	53.68	347.2	46.32
Fresh Water	16.4	0.0	0.00	2.5	15.24	13.9	84.76	2.5	15.24
Recycled	17.7	0.3	1.69	4.2	23.73	13.2	74.58	4.5	25.42
Sequence #1	68.5	0.9	1.31	20.1	29.34	47.5	69.34	21.0	30.66
Sequence #2	54.3	0.0	0.00	13.0	23.94	41.3	76.06	13.0	23.94
Sequence #3	47.0	4.1	8.73	15.1	32.14	27.8	59.14	19.2	40.86
Sequence #4	110.3	2.6	2.38	50.8	46.06	56.9	51.56	53.4	48.44
Sequence #5	15.9	0.0	0.00	3.9	24.47	12.0	75.53	3.9	24.47
Batch Test #2	26.2	0.2	0.76	9.2	35.11	16.8	64.12	9.4	35.88
Total	**6863.6**	**168.1**	**2.45**	**2177.5**	**31.73**	**4518.0**	**65.83**	**2345.6**	**34.17**

Table 14
Gravel Separator Performance Evaluation Data[1]

Batch	Total Mass (tons)	Oversize[2] Mass (tons)	% Oversize	Th-232 Activity Oversize (pCi/g)	Th-232 Activity Oversize (pCi)	Th-232 Activity Total (pCi/g)	Th-232 Activity Total (pCi)	% Th-232 Oversize	Ra-226 Activity Oversize (pCi/g)	Ra-226 Activity Oversize (pCi)	Ra-226 Activity Total (pCi/g)	Ra-226 Activity Total (pCi)	% Ra-226 Oversize	U-238 Activity Oversize (pCi/g)	U-238 Activity Oversize (pCi)	U-238 Activity Total (pCi/g)	U-238 Activity Total (pCi)	% U-238 Oversize
1	38.685	10.42	26.9	9.05	8.56E+07	7.86	2.76E+08	31.0	2.25	2.13E+07	1.85	6.49E+07	32.8	3.36	3.18E+07	2.48	8.72E+07	36.5
2	56.13	14.355	25.6	8.45	1.10E+08	7.30	3.72E+08	29.6	2.21	2.88E+07	0.96	4.89E+07	58.9	0.37	4.82E+06	1.41	7.18E+07	6.7
3	142.84	31.18	21.8	8.31	2.35E+08	6.65	8.63E+08	27.3	2.18	6.17E+07	1.88	2.44E+08	25.3	3.81	1.08E+08	1.60	2.08E+08	51.9
4	58.565	13.95	23.8	2.64	3.34E+07	6.36	3.38E+08	9.9	2.06	2.61E+07	2.07	1.10E+08	23.7	7.87	9.97E+07	5.79	3.08E+08	32.4
5	101.745	28.8	28.3	1.71	4.47E+07	3.44	3.18E+08	14.1	1.09	2.85E+07	1.40	1.29E+08	22.1	2.02	5.28E+07	2.45	2.26E+08	23.4
7	170.815	59.315	34.7	2.09	1.13E+08	6.38	9.90E+08	11.4	1.32	7.11E+07	1.93	2.99E+08	23.8	2.14	1.15E+08	2.19	3.39E+08	34.0
8	142.63	44.84	31.4	1.82	7.41E+07	4.12	5.34E+08	13.9	1.04	4.23E+07	1.49	1.93E+08	21.9	4.78	1.95E+08	2.70	3.50E+08	55.6
9	108.84	38.485	35.4	2.13	7.44E+07	10.32	1.02E+09	7.3	1.77	6.19E+07	1.60	1.58E+08	39.1	0.36	1.26E+07	1.74	1.72E+08	7.3
1-1	741.02	287.66	38.8	0.88	2.30E+08	1.72	1.16E+09	19.8	0.66	1.72E+08	0.45	3.02E+08	57.1	1.59	4.15E+08	2.53	1.70E+09	24.4
8-1	271.57	68.025	25.0	2.51	1.55E+08	3.77	9.29E+08	16.7	1.39	8.59E+07	1.63	4.02E+08	21.4	0.16	9.88E+06	1.79	4.41E+08	2.2
8-2	300.89	52.37	17.4	2.41	1.15E+08	4.83	1.32E+09	8.7	1.22	5.80E+07	0.90	2.45E+08	23.7	3.57	1.70E+08	1.61	4.39E+08	38.7
6-1	267	57.05	21.4	4.54	2.35E+08	7.71	1.87E+09	12.6	2.32	1.20E+08	2.57	6.24E+08	19.3	2.29	1.19E+08	2.52	6.10E+08	19.4
1-3	127	48.4	38.1	19.8	8.70E+08	28.88	3.33E+09	26.1	4.57	2.01E+08	6.54	7.54E+08	26.6	3.87	1.70E+08	4.49	5.18E+08	32.8
1-5	174.495	48.325	27.7	20.9	9.17E+08	23.04	3.65E+09	25.1	5.12	2.25E+08	5.60	8.88E+08	25.3	9.48	4.16E+08	7.13	1.13E+09	36.8
Batch Test #2	26.2	9.2	35.1	6.89	5.76E+07	11.94	2.84E+08	20.3	1.91	1.60E+07	2.71	6.45E+07	24.7	0.00	0.00E+00	5.21	1.24E+08	0.0
7-1	259.2	94.2	36.3	10.2	8.72E+08	19.16	4.51E+09	19.3	2.10	1.80E+08	4.17	9.81E+08	18.3	3.56	3.04E+08	3.59	8.46E+08	36.0
8-3	354.62	99.78	28.1	21.05	1.91E+09	30.06	9.68E+09	19.7	0.00	0.00E+00	0.00			0.00	0.00E+00	0.00		
Batch Sequence 5	15.94	3.9	24.5	24.4	8.64E+07	31.16	4.51E+08	19.2	4.72	1.67E+07	6.18	8.94E+07	18.7	4.24	1.50E+07	6.38	9.23E+07	16.3
7-4	115.23	44.24	38.4	1.64	6.59E+07	3.32	3.47E+08	19.0	1.01	4.06E+07	1.30	1.36E+08	29.8	0.63	2.53E+07	2.52	2.64E+08	9.6
7-5	196.96	77.165	39.2	1.68	1.18E+08	2.75	4.91E+08	24.0	1.07	7.50E+07	1.21	2.16E+08	34.7	2.60	1.82E+08	2.09	3.74E+08	48.7
7-6	227.5	108.8	47.8	2.89	2.86E+08	3.64	7.52E+08	38.0	1.89	1.87E+08	1.61	3.32E+08	56.2	2.69	2.66E+08	1.74	3.60E+08	73.8
6-6	191.7	62.8	32.8	3.44	1.96E+08	9.19	1.60E+09	12.3	1.25	7.13E+07	2.40	4.18E+08	17.1	5.13	2.93E+08	4.07	7.08E+08	41.3
6-7	371	121.1	32.6	5.6	6.16E+08	9.26	3.12E+09	19.7	1.83	2.01E+08	2.30	7.74E+08	26.0	4.24	4.66E+08	4.13	1.39E+09	33.5
8-5	205.4	67.2	32.7	5.77	3.52E+08	20.96	3.91E+09	9.0	2.50	1.53E+08	6.06	1.13E+09	13.5	3.13	1.91E+08	5.17	9.64E+08	19.8
Recycled Water	17.7	4.2	23.7	13.81	5.27E+07	54.07	8.69E+08	6.1	1.31	5.00E+06	12.01	1.93E+08	2.6	2.26	8.62E+06	49.34	7.93E+08	1.1
TOTAL	**4683.675**	**1495.76**	**31.9**		**7.90E+09**		**4.30E+10**	**18.4**		**2.15E+09**		**8.80E+09**	**24.4**		**3.67E+09**		**1.25E+10**	**29.3**

Notes:
1. Data analysis performed only on those batches with complete radiochemical data for oversize fraction plus accepted and rejected material from RSS.
2. Oversize consists of material >3/8" and <6" based on weight of Stockpile J.

Table 15
Rinse Unit Performance Evaluation Data

Batch	Date	Th-232 Before Rinse (pCi/g)	Th-232 After Rinse (pCi/g)	% Reduction	Ra-226 Before Rinse (pCi/g)	Ra-226 After Rinse (pCi/g)	% Reduction	U-238 Before Rinse (pCi/g)	U-238 After Rinse (pCi/g)	% Reduction
6-6	10/31/00	3.44	1.48	56.98	1.25	0.7	44.00	5.13	2.95	42.50
6-7	11/3/00	4.31	3.17	26.45	1.53	1.75	-14.38	4.54	3.77	16.96
Recycled	11/8/00	13.81	2.1	84.79	3.95	1.54	61.01	3.13	1.34	57.19
Recycled	11/8/00	4.07	2.4	41.03	2.3	1.98	13.91	2.02	2.02	0.00
Fresh	11/8/00	10.9	2.9	73.39	3.29	1.38	58.05	8.36	1.46	82.54
5	10/24/00	24.4	12.47	48.89	4.72	3.07	34.96	4.24	3.85	9.20

Table 16
Slug Summary, Radiological Characteristics

Slug	Date	Source	Ra + Th Setpoint (pCi/g)	U Setpoint (pCi/g)	Total Mass (g)	Mass Rejected (g)	% Rejected	Th-232 Rejected (pCi/g)	Ra-226 Rejected (pCi/g)	U-238 Rejected (pCi/g)	Mass Accepted (g)	% Accepted	Th-232 Accepted (pCi/g)	Ra-226 Accepted (pCi/g)	U-238 Accepted (pCi/g)
On Site	8/17/00	Stockpile	15	50	5.14E+06	5.14E+06	100.0	8.83	2.13	3.27	0.00E+00	0.0			
Engineered		Fabricated	13.75	>	1.18E+07	5.64E+06	47.8	18.47	3.89	6.51	6.18E+06	52.3	12.77	2.58	4.27
6-1	9/14/00	G7-I9	5	50	1.03E+07	1.03E+07	100.0	28.38	14.6	5.4	0.00E+00	0.0			
6-2	10/05/00	EE15-GG17	24	>	1.81E+07	1.06E+07	58.6	21.55	3.95	4.65	4.54E+05	2.5	20.95	3.81	2.93
6-3	10/20/00	DD5-FF7	5	50	1.46E+07	1.46E+07	100.0	6.9	2.59	3.5	0.00E+00	0.0			
7-1	10/4/00	HH28-JJ30	10	>	6.23E+06	6.23E+06	100.0	23.04	5.39	5.47	0.00E+00	0.0			
7-2	10/11/00	P8-R10	5	>	1.25E+07	8.18E+05	6.5				1.17E+07	93.6	1.9	1.04	1.94
7-3	10/17/00	T5-V7	5	50	1.19E+07	0.00E+00	0.0				1.19E+07	100.0	3.19	1.4	3.65
7-4	10/19/00	T11-V13	5	50	1.55E+07	1.08E+07	69.7	5.4	1.97	4.27	4.34E+06	28.0	6.13	2.4	3.1
8-1	9/7/00	N19-P21	5.68	>	6.37E+06	6.37E+06	100.0	67.02	6.44	7.12	0.00E+00	0.0			
8-2	9/13/00	C4-E6	5.68	>	5.04E+06	4.83E+06	95.8	7.3	3.61	5.52	2.09E+05	4.1			
8-3	10/4/00	DD21-FF23	24	>	1.45E+07	0.00E+00	0.0				1.46E+07	100.7	17.88	3.61	6.35
8-4	10/18/00	T8-V10	5	50	1.56E+07	1.36E+06	8.7				1.43E+07	91.7	2.76	1.37	3.07

Note: Mass values obtained from weighed stockpiles (G, H, and G+H) after processing. Radiological data from on-site laboratory analysis.

Table 17
Batch Summary, Radiological Characteristics

Batch	Date	Ra + Th Setpoint (pCi/g)	U Setpoint (pCi/g)	Total Mass (kg)	Mass Rejected (kg)	% Rejected	Ra-226 Rejected (pCi/g)	Th-232 Rejected (pCi/g)	U-238 Rejected (pCi/g)	Mass Accepted (kg)	% Accepted	Ra-226 Accepted (pCi/g)	Th-232 Accepted (pCi/g)	U-238 Accepted (pCi/g)
1	8/18/00	15	50	20759	1863.63	9.0	1.81	7.6	2.12	18895.45	91.0	2.13	9.29	2.93
2	8/21/00	15	>	38568	3695	9.6				34873	90.4	2.01	7.5	1.92
3	8/22/00	15	>	88491	4377	4.9				84114	95.1	2.17	7.47	1.19
4	8/23/00	15	>	41300	2409	5.8	2.06	6.67	2.47	38891	94.2	2.03	7.41	5.2
5	8/24/00	15	>	50750	28559	56.3	2.13	5.09	3.21	22191	43.7	1.78	5.79	3.69
7	8/28/00	5.68	>	117209	95523	81.5	2	7.68	1.7	21686	18.5	1.72	4.91	2.87
8	8/29/00	5.68	>	92727	48955	52.8	1.66	5	1.97	43774	47.2	1.59	4.9	1.32
9	8/30/00	5.68	>	63877	46918	73.5	1.34	3.66	2.18	16909	26.5	2.04	5.94	3.41
1-1 (partial)	8/31/00	5.68	>	87609	6445	7.4				81164	92.6	0.98	1.97	1.57
1-1 (partial)	9/1/00	5.68	>	83786	4973	5.9				78814	94.1	1.03	2.95	3.39
1-1 (partial)	9/5/00	5.68	>	49118	3686	7.5				45432	92.5	1.2	2.48	4.54
1-1 (partial)	9/6/00	5.68	>	124514	6677	5.4	1.32	2.71	5.29	117836	94.6	1.07	2.39	1.27
1-1 (partial)	9/7/00	5.68	>	105650	5591	5.3				100059	94.7	1.82	2.83	3.19
8-1 (partial)	9/8/00	5.68	>	81641	34609	42.4	2.4	4.51	0.96	47032	57.6	1.96	4.2	3.52
8-1 (partial)	9/11/00	5.68	>	51309	21545	42.0				29764	58.0	1.91	8.14	4.27
8-1 (partial)	9/12/00	5.68	>	26400	1495	5.7				24905	94.3	1.72	3.62	3.44
8-2 (partial)	9/13/00	5.68	>	66136	18855	28.5	3.08	6.8	4.14	47282	71.5	1.49	3.69	3.76
8-2 (partial)	9/14/00	5.68	>	89955	49941	55.5	2.04	15.2	1.19	40014	44.5	1.94	4.42	4.22
6-1 (partial)	9/19/00	5.68	>	82864	81636	98.5	15.1	49.9	12	1227	1.5			
6-1 (partial)	9/20/00	5.68	>	33495	31636	94.4	9.86	39.7	8.83	1859	5.6			
6-1 (partial)	9/21/00	15	>	58923	29636	50.3				29286	49.7			
1-2	9/26/00	5.68	>	31705	31705	100.0				0	0.0			
1-3	9/27/00	15	>	63636	63636	100.0	8.68	38.7	5.47	0	0.0			
1-4	10/2/00	15	>	35632	35632	100.0	8.58	31.9	4.45	0	0.0			
1-5	10/3/00	15	>	107123	107123	100.0	6.19	25.6	6.65	0	0.0			
Batch Test #2	10/5/00	17	>	14636	14636	100.0	3.32	15.5	8.5	0	0.0			
7-1 (partial)	10/6/00	20	>	54455	15909	29.2	5.78	24	5.32	38545	70.8	5.56	24.5	3.34
7-1 (partial)	10/9/00	32	>	104727	6545	6.2	4.28	20.7	3.67	98182	93.8	4.48	21.5	3.1
8-3 (partial	10/10/00	32	>	77365	22455	29.0		29.1		54909	71.0		29.6	
8-3 (partial)	10/11/00	32	>	61091	20000	32.7		26.4		41091	67.3		25.6	
Seq. Batch #1	10/12/00	5	>	39091	15636	40.0	2.72	8.11	1.68	23455	60.0	1.22	2.2	2.42
8-3 (partial)	10/16/00	15	>	97391	97391	100.0		44.1		0	0.0			
Seq. Batch #2	10/19/00	5	50	36000	15091	41.9	3.54	9.14	4.22	20909	58.1	3	9.24	3.66

Batch	Date	Ra + Th Setpoint (pCi/g)	U Setpoint (pCi/g)	Total Mass (kg)	Mass Rejected (kg)	% Rejected	Ra-226 Rejected (pCi/g)	Th-232 Rejected (pCi/g)	U-238 Rejected (pCi/g)	Mass Accepted (kg)	% Accepted	Ra-226 Accepted (pCi/g)	Th-232 Accepted (pCi/g)	U-238 Accepted (pCi/g)
Seq. Batch #3	10/23/00	5	50	20823	1177	5.7				19645	94.3	1.65	3.64	4.3
Seq. Batch #4	10/24/00	5	50	48709	9259	19.0	2.11	6.37	3.84	39450	81.0	1.83	4.07	2.89
Seq. Batch #5	10/24/00	5	50	14491	10945	75.5	33.51	6.69	7.09	0	0.0			
7-4	10/25/00	5	50	65668	9932	15.1	1.36	5.06	2.21	55736	84.9	4.15	1.48	3.89
7-5	10/26/00	5	50	100245	10800	10.8	1.63	5.81	5.39	89445	89.2	3.47	1.38	1.5
7-6	10/27/00	5	50	97882	85968	87.8	1.48	4.81	0.79	11914	12.2	4.37	1.48	2.2
6-5	10/30/00	5	50	99068	99068	100.0				0	0.0			
6-6 (partial)	10/31/00	5	50	69873	69873	100.0	4.28	16.9	6.77	0	0.0			
6-6 (partial)	10/31/00	15	50	12350	6101	49.4	4.35	17.2	3.32	6249	50.6	2.85	10.8	3.79
6-7	11/2/00	15	50	127345	123877	97.3	4.62	20.1	7.43	3815	3.0			
6-7 (oversize)	11/3/00	5	50	11610	8374	72.1	4.49	20.1	8.07	3236	27.9			
8-5	11/7/00	15	50	124977	122877	98.3	7.81	28.6	6.06	2100	1.7	21.6	6.54	13.32

Note: Mass values obtained from weighed stockpiles (G, H, and G+H) after processing. Radiological data from on-site laboratory analysis.

Table 18
Slug Performance Summary

Slug	Ra+Th Setpoint (pCi/g)	Total Mass (tons)	Rejected Mass (tons)	Reject Error (tons)	Accepted Mass (tons)	Accepted Error (tons)
2-6	24	12.2	11.7	0.0	0.5	0.5
3-8	24	15.9	0.0	0.0	15.9	0.0
Engineered	15	13.0	6.2	0.0	6.8	6.8
On-site	13.75	5.7	5.7	0.0	0.0	0.0
1-7	10	13.7	13.7	0.0	0.0	0.0
1-6	5	11.3	11.3	0.0	0.0	0.0
3-6	5	16.1	16.1	0.0	0.0	0.0
2-7	5	13.8	0.9	NA	12.9	0.0
3-7	5	13.1	0.0	0.0	13.1	0.0
4-7	5	17.0	11.9	0.0	5.1	5.1
1-8	5.68	7.0	7.0	0.0	0.0	0.0
2-8	5.68	5.5	5.3	0.0	0.2	NA
4-8	5	17.2	1.5	NA	15.7	0.0
Totals		**161.4**	**91.2**	**0.0**	**70.2**	**12.9**
Error %				**0.0**		**18.4**

Note:
NA – Not Applicable

Table 19
Batch Performance Summary

Batch	Ra+Th Setpoint (pCi/g)	Total Mass (tons)	Rejected Mass (tons)	Reject Error (tons)	Accepted Mass (tons)	Accepted Error (tons)
1	15	22.8	2.1	2.1	20.8	
1-1	5.68	495.8	30.1	NA	465.7	
1-3	5.68	70.0	70.0		0.0	
1-4	5.68	39.2	39.2		0.0	
1-5	15	117.8	117.8		0.0	
2	15	42.4	4.1	NA	38.4	
3	15	97.3	4.8	NA	92.5	
4	15	45.4	2.7	2.7	42.8	
5	15	55.8	31.4	31.4	24.4	
6-1	5.68	64.8	32.6		32.2	32.2
6-6	5.68	90.4	90.4		0.0	
6-7	15	140.1	136.3		3.8	NA
7	5.68	128.9	105.1		23.9	23.9
7-1	20	59.9	17.5	17.5	42.4	
7-1	32	115.2	7.2	7.2	108.0	
7-4	5	72.2	10.9		61.3	61.3
7-5	5	110.3	11.9		98.4	
7-6	5	107.7	94.6		13.1	13.1
8	5.68	102.0	53.9		48.2	48.2
8-1	5.68	175.3	63.4		108.9	108.9
8-2	5.68	171.7	75.7		96.0	96.0
8-3	32	152.3	46.7	-1.0	105.6	105.6
8-3	15	107.1	107.1		0.0	
8-5	16	137.5	135.2		2.3	2.3
9	5.68	69.8	51.7	51.7	18.6	18.6
Recycled	25	26.6	26.6		0.0	
Sequence 1	5	40.0	17.2		25.8	
Sequence 2	5	39.6	16.6		23.0	23.0
Sequence 3	5	22.9	1.3	NA	21.6	21.6
Sequence 4	5	53.6	10.2		43.4	43.4
Sequence 5	5	12.0	12.0		0.0	
Batch Test 2	17	16.1	16.1		0.0	
Total		**3002.8**	**1442.2**	**111.5**	**1561.0**	**492.5**
Error %				**7.73**		**31.55**

Note:
NA – Not Applicable

Table 20
Range of Daytime L_{90} and L_{eq} Ambient Sound Levels,
With and Without Screening Process in Operation

Location	L_{90} (1)		L_{eq} (2)	
	High (3)	Low	High	Low
1 (4)	58 (55)		65 (61)	
2	61 (56)	56 (52)	73 (69)	71 (62)
3	61 (57)	58 (56)	72 (71)	70 (68)
4 (4)	63 (61)		72 (68)	

Notes:
1. The L90 is the sound level in dBA exceeded 90% of the time.
2. The Leq, or equivalent sound level, is the energy average level.
3. (parenthesis) values are the ambient levles without the screening process operating.
4. Only one survey conducted rather than two.

Table 21
Chemical Sample Evaluation

Process Stockpile ID	Total Samples Collected	Count of Samples with Detected Results	% Samples with Detected Results	Analyte Group	Analysis Name	Average Result (units vary)	various units	Standard Deviation (results vary)	Average Result (mg/kg)	Direct Contact, Residential (mg/kg)	Direct Contact, Industrial (mg/kg)	Result > NJ Residential.?	Result > NJ Industrial.?
F	1	1	100	Char	Sulfide, Reactive	38.800	mg/kg	---	38.80			no	no
G	50	2	4	Char	Sulfide, Reactive	44.800	mg/kg	40.87	44.80			no	no
H	53	5	9.4339623	Char	Sulfide, Reactive	23.820	mg/kg	11.12	23.82			no	no
In situ	8	7	87.50	Char	Sulfide, Reactive	10.857	mg/kg	2.27	10.86				
J	51	2	3.9215686	Char	Sulfide, Reactive	15.950	mg/kg	0.07	15.95			no	no
F	8	8	100	Metals	Aluminum, Total	6520.000	mg/kg	411.79	6520.00			no	no
G	56	1	1.7857143	Metals	Aluminum, Total	7617.679	mg/kg	1795.70	7617.68			no	no
H	56	56	100	Metals	Aluminum, Total	7484.107	mg/kg	1635.01	7484.11			no	no
I	4	3	75	Metals	Aluminum, Total	3840	mg/kg	377.49	3840.00			no	no
In situ	17	17	100.00	Metals	Aluminum, Total	27118.235	mg/kg	35562.55	27118.24			yes	yes
J	54	54	100	Metals	Aluminum, Total	7089.630	mg/kg	1598.58	7089.63			no	no
F	8	8	100	Metals	Antimony, Total	1.075	mg/kg	0.07	1.08	14	340	no	no
G	56	56	100	Metals	Antimony, Total	0.912	mg/kg	0.33	0.91	14	340	no	no
H	56	56	100	Metals	Antimony, Total	0.673	mg/kg	0.30	0.67	14	340	no	no
I	4	4	100	Metals	Antimony, Total	1.25	mg/kg	0.13	1.25	14	340	no	no
In situ	17	17	100.00	Metals	Antimony, Total	0.834	mg/kg	0.60	0.83	14	340	no	no
J	54	54	100	Metals	Antimony, Total	0.742	mg/kg	0.31	0.74	14	340	no	no
F	8	8	100	Metals	Arsenic, Total	12.825	mg/kg	3.28	12.83	20	20	no	no
G	56	56	100	Metals	Arsenic, Total	13.568	mg/kg	7.51	13.57	20	20	no	no
H	56	56	100	Metals	Arsenic, Total	8.048	mg/kg	4.20	8.05	20	20	no	no
I	4	4	100	Metals	Arsenic, Total	10.875	mg/kg	13.08	10.88	20	20	no	no
In situ	17	17	100.00	Metals	Arsenic, Total	15.059	mg/kg	11.23	15.06	20	20	no	no
J	54	54	100	Metals	Arsenic, Total	8.852	mg/kg	5.63	8.85	20	20	no	no
F	8	8	100	Metals	Barium, Total	67.713	mg/kg	10.97	67.71	700	47000	no	no
G	56	56	100	Metals	Barium, Total	77.946	mg/kg	32.40	77.95	700	47000	no	no
H	56	56	100	Metals	Barium, Total	56.073	mg/kg	21.10	56.07	700	47000	no	no
I	4	4	100	Metals	Barium, Total	33.175	mg/kg	2.36	33.18	700	47000	no	no
In situ	17	17	100.00	Metals	Barium, Total	72.994	mg/kg	35.99	72.99	700	47000	no	no
J	54	53	98.148148	Metals	Barium, Total	60.730	mg/kg	23.45	60.73	700	47000	no	no
F	8	8	100	Metals	Beryllium, Total	0.474	mg/kg	0.03	0.47	2	2	no	no
G	56	56	100	Metals	Beryllium, Total	0.525	mg/kg	0.13	0.52	2	2	no	no
H	56	56	100	Metals	Beryllium, Total	0.430	mg/kg	0.11	0.43	2	2	no	no

Table 21
Chemical Sample Evaluation

Process Stockpile ID	Total Samples Collected	Count of Samples with Detected Results	% Samples with Detected Results	Analyte Group	Analysis Name	Average Result (units vary)	various units	Standard Deviation (results vary)	Average Result (mg/kg)	Direct Contact, Residential (mg/kg)	Direct Contact, Industrial (mg/kg)	Result > NJ Residential.?	Result > NJ Industrial.?
I	4	4	100	Metals	Beryllium, Total	0.3475	mg/kg	0.06	0.35	2	2	no	no
In situ	17	17	100.00	Metals	Beryllium, Total	1.242	mg/kg	1.26	1.24	2	2	no	no
J	54	54	100	Metals	Beryllium, Total	0.441	mg/kg	0.12	0.44	2	2	no	no
F	8	8	100	Metals	Cadmium, Total	0.108	mg/kg	0.01	0.11	39	100	no	no
G	56	56	100	Metals	Cadmium, Total	0.142	mg/kg	0.08	0.14	39	100	no	no
H	56	56	100	Metals	Cadmium, Total	0.148	mg/kg	0.10	0.15	39	100	no	no
I	4	4	100	Metals	Cadmium, Total	0.125	mg/kg	0.01	0.13	39	100	no	no
In situ	17	17	100.00	Metals	Cadmium, Total	0.325	mg/kg	0.29	0.33	39	100	no	no
J	54	54	100	Metals	Cadmium, Total	0.124	mg/kg	0.08	0.12	39	100	no	no
F	8	8	100	Metals	Calcium, Total	10056.250	mg/kg	3535.02	10056.25			no	no
G	56	56	100	Metals	Calcium, Total	8036.429	mg/kg	2391.97	8036.43			no	no
H	56	56	100	Metals	Calcium, Total	7534.107	mg/kg	3268.96	7534.11			no	no
I	4	4	100	Metals	Calcium, Total	6310	mg/kg	821.91	6310.00			no	no
In situ	17	17	100.00	Metals	Calcium, Total	17171.176	mg/kg	13472.53	17171.18				
J	54	54	100	Metals	Calcium, Total	7214.352	mg/kg	4024.59	7214.35			no	no
F	8	8	100	Metals	Chromium, Total	112.938	mg/kg	45.01	112.94			no	no
G	56	56	100	Metals	Chromium, Total	88.511	mg/kg	50.21	88.51			no	no
H	56	56	100	Metals	Chromium, Total	81.213	mg/kg	64.92	81.21			no	no
I	4	4	100	Metals	Chromium, Total	21.35	mg/kg	2.99	21.35			no	no
In situ	17	17	100.00	Metals	Chromium, Total	73.094	mg/kg	183.43	73.09				
J	54	54	100	Metals	Chromium, Total	75.478	mg/kg	56.45	75.48			no	no
F	8	8	100	Metals	Cobalt, Total	3.963	mg/kg	0.36	3.96			no	no
G	56	56	100	Metals	Cobalt, Total	4.616	mg/kg	1.02	4.62			no	no
H	56	56	100	Metals	Cobalt, Total	5.379	mg/kg	1.61	5.38			no	no
I	4	4	100	Metals	Cobalt, Total	3.525	mg/kg	0.64	3.53			no	no
In situ	17	17	100.00	Metals	Cobalt, Total	3.958	mg/kg	2.27	3.96			yes	yes
J	54	54	100	Metals	Cobalt, Total	4.994	mg/kg	1.53	4.99			no	no
F	8	8	100	Metals	Copper, Total	35.000	mg/kg	5.08	35.00	600	600	no	no
G	56	56	100	Metals	Copper, Total	85.546	mg/kg	361.49	85.55	600	600	no	no
H	56	56	100	Metals	Copper, Total	36.696	mg/kg	19.87	36.70	600	600	no	no
I	4	4	100	Metals	Copper, Total	69.15	mg/kg	83.23	69.15	600	600	no	no
In situ	17	17	100.00	Metals	Copper, Total	61.965	mg/kg	60.55	61.96	600	600		

Table 21
Chemical Sample Evaluation

Process Stockpile ID	Total Samples Collected	Count of Samples with Detected Results	% Samples with Detected Results	Analyte Group	Analysis Name	Average Result (units vary)	various units	Standard Deviation (results vary)	Average Result (mg/kg)	Direct Contact, Residential (mg/kg)	Direct Contact, Industrial (mg/kg)	Result > NJ Residential.?	Result > NJ Industrial.?
J	54	54	100	Metals	Copper, Total	32.622	mg/kg	20.58	32.62	600	600	no	no
F	8	8	100	Metals	Iron, Total	11311.250	mg/kg	2550.14	11311.25			no	no
G	56	56	100	Metals	Iron, Total	12499.464	mg/kg	2955.99	12499.46			no	no
H	56	56	100	Metals	Iron, Total	13052.321	mg/kg	2679.92	13052.32			no	no
I	4	4	100	Metals	Iron, Total	12502.5	mg/kg	5886.10	12502.50			no	no
In situ	17	17	100.00	Metals	Iron, Total	11302.353	mg/kg	7065.89	11302.35			yes	yes
J	54	54	100	Metals	Iron, Total	12608.333	mg/kg	3535.04	12608.33			no	no
F	8	8	100	Metals	Lead, Total	77.213	mg/kg	8.93	77.21	400	600	no	no
G	56	56	100	Metals	Lead, Total	126.743	mg/kg	240.27	126.74	400	600	no	no
H	56	56	100	Metals	Lead, Total	80.998	mg/kg	58.33	81.00	400	600	no	no
I	4	4	100	Metals	Lead, Total	25.175	mg/kg	4.20	25.18	400	600	no	no
In situ	17	17	100.00	Metals	Lead, Total	107.576	mg/kg	136.03	107.58	400	600	no	no
J	54	54	100	Metals	Lead, Total	65.924	mg/kg	48.84	65.92	400	600	no	no
F	8	8	100	Metals	Magnesium, Total	1556.250	mg/kg	152.59	1556.25			no	no
H	56	56	100	Metals	Magnesium, Total	2850.768	mg/kg	1758.81	2850.77			no	no
I	4	4	100	Metals	Magnesium, Total	1378	mg/kg	439.73	1378.00			no	no
In situ	17	17	100.00	Metals	Magnesium, Total	1858.941	mg/kg	1462.03	1858.94				
J	54	54	100	Metals	Magnesium, Total	2353.944	mg/kg	1449.87	2353.94			no	no
F	8	8	100	Metals	Manganese, Total	261.875	mg/kg	110.42	261.88			no	no
G	56	56	100	Metals	Manganese, Total	252.446	mg/kg	60.00	252.45			no	no
H	56	56	100	Metals	Manganese, Total	235.268	mg/kg	47.38	235.27			no	no
I	4	4	100	Metals	Manganese, Total	327	mg/kg	214.68	327.00			no	no
In situ	17	17	100.00	Metals	Manganese, Total	258.600	mg/kg	183.15	258.60			no	no
J	54	54	100	Metals	Manganese, Total	262.463	mg/kg	72.18	262.46			no	no
F	8	8	100	Metals	Mercury, Total	0.480	mg/kg	0.43	0.48	14	270	no	no
G	56	56	100	Metals	Mercury, Total	0.347	mg/kg	0.27	0.35	14	270	no	no
H	56	56	100	Metals	Mercury, Total	0.241	mg/kg	0.18	0.24	14	270	no	no
I	4	4	100	Metals	Mercury, Total	0.10775	mg/kg	0.09	0.11	14	270	no	no
In situ	17	17	100.00	Metals	Mercury, Total	1.459	mg/kg	4.51	1.46	14	270	no	no
J	54	54	100	Metals	Mercury, Total	0.233	mg/kg	0.18	0.23	14	270	no	no
F	8	8	100	Metals	Molybdenum, Total	0.971	mg/kg	0.58	0.97			no	no
G	56	56	100	Metals	Molybdenum, Total	0.951	mg/kg	0.45	0.95			no	no

Table 21
Chemical Sample Evaluation

Process Stockpile ID	Total Samples Collected	Count of Samples with Detected Results	% Samples with Detected Results	Analyte Group	Analysis Name	Average Result (units vary)	various units	Standard Deviation (results vary)	Average Result (mg/kg)	Direct Contact, Residential (mg/kg)	Direct Contact, Industrial (mg/kg)	Result > NJ Residential.?	Result > NJ Industrial.?
H	56	56	100	Metals	Molybdenum, Total	0.717	mg/kg	0.31	0.72			no	no
I	4	4	100	Metals	Molybdenum, Total	1.2275	mg/kg	1.05	1.23			no	no
J	54	54	100	Metals	Molybdenum, Total	0.694	mg/kg	0.33	0.69			no	no
F	8	8	100	Metals	Nickel, Total	11.088	mg/kg	3.01	11.09	250	2400	no	no
G	56	56	100	Metals	Nickel, Total	12.466	mg/kg	4.79	12.47	250	2400	no	no
H	56	56	100	Metals	Nickel, Total	12.355	mg/kg	2.81	12.36	250	2400	no	no
I	4	4	100	Metals	Nickel, Total	7.7	mg/kg	1.95	7.70	250	2400	no	no
In situ	17	17	100.00	Metals	Nickel, Total	13.141	mg/kg	8.19	13.14	250	2400		
J	54	54	100	Metals	Nickel, Total	11.283	mg/kg	2.87	11.28	250	2400	no	no
F	8	8	100	Metals	Potassium, Total	706.750	mg/kg	59.31	706.75			no	no
G	56	55	98.214286	Metals	Potassium, Total	769.927	mg/kg	241.95	769.93			no	no
H	56	55	98.214286	Metals	Potassium, Total	714.509	mg/kg	212.09	714.51			no	no
I	4	4	100	Metals	Potassium, Total	520	mg/kg	27.02	520.00			no	no
In situ	17	17	100.00	Metals	Potassium, Total	728.588	mg/kg	246.52	728.59			yes	yes
J	54	54	100	Metals	Potassium, Total	715.574	mg/kg	220.25	715.57			no	no
G	56	30	53.571429	Metals	Selenium, Total	1.021	mg/kg	0.35	1.02	63	3100	no	no
H	56	44	78.571429	Metals	Selenium, Total	0.939	mg/kg	0.31	0.94	63	3100	no	no
In situ	17	17	100.00	Metals	Selenium, Total	0.898	mg/kg	0.45	0.90	63	3100	no	no
J	54	35	64.814815	Metals	Selenium, Total	1.023	mg/kg	0.40	1.02	63	3100	no	no
F	8	8	100	Metals	Silver, Total	0.218	mg/kg	0.01	0.22	110	4100	no	no
G	56	56	100	Metals	Silver, Total	0.247	mg/kg	0.46	0.25	110	4100	no	no
H	56	56	100	Metals	Silver, Total	0.183	mg/kg	0.06	0.18	110	4100	no	no
I	4	4	100	Metals	Silver, Total	0.245	mg/kg	0.03	0.25	110	4100	no	no
In situ	17	17	100.00	Metals	Silver, Total	0.141	mg/kg	0.09	0.14	110	4100	no	no
J	54	54	100	Metals	Silver, Total	0.173	mg/kg	0.06	0.17	110	4100	no	no
F	8	8	100	Metals	Sodium, Total	332.375	mg/kg	43.71	332.38			no	no
G	56	56	100	Metals	Sodium, Total	398.696	mg/kg	181.08	398.70			no	no
H	56	56	100	Metals	Sodium, Total	426.879	mg/kg	231.64	426.88			no	no
I	4	4	100	Metals	Sodium, Total	163.5	mg/kg	26.64	163.50			no	no
In situ	17	17	100.00	Metals	Sodium, Total	1284.647	mg/kg	1987.41	1284.65			yes	yes
J	54	54	100	Metals	Sodium, Total	347.989	mg/kg	201.73	347.99			no	no
F	8	8	100	Metals	Thallium, Total	1.350	mg/kg	0.16	1.35	2	2	no	no

Table 21
Chemical Sample Evaluation

Process Stockpile ID	Total Samples Collected	Count of Samples with Detected Results	% Samples with Detected Results	Analyte Group	Analysis Name	Average Result (units vary)	various units	Standard Deviation (results vary)	Average Result (mg/kg)	Direct Contact, Residential (mg/kg)	Direct Contact, Industrial (mg/kg)	Result > NJ Residential.?	Result > NJ Industrial.?
G	56	54	96.428571	Metals	Thallium, Total	1.444	mg/kg	0.48	1.44	2	2	no	no
H	56	55	98.214286	Metals	Thallium, Total	1.089	mg/kg	0.34	1.09	2	2	no	no
I	4	4	100	Metals	Thallium, Total	1.925	mg/kg	0.57	1.93	2	2	no	no
In situ	17	17	100.00	Metals	Thallium, Total	0.743	mg/kg	0.25	0.74	2	2	#REF!	#REF!
J	54	53	98.148148	Metals	Thallium, Total	1.177	mg/kg	0.50	1.18	370	7100	no	no
F	8	8	100	Metals	Vanadium, Total	13.663	mg/kg	1.56	13.66	370	7100	no	no
G	56	56	100	Metals	Vanadium, Total	17.720	mg/kg	4.74	17.72	370	7100	no	no
H	56	56	100	Metals	Vanadium, Total	20.386	mg/kg	7.05	20.39	370	7100	no	no
I	4	3	75	Metals	Vanadium, Total	21.766667	mg/kg	16.40	21.77	370	7100	no	no
In situ	17	17	100.00	Metals	Vanadium, Total	15.207	mg/kg	8.42	15.21	1500	1500	no	no
J	54	54	100	Metals	Vanadium, Total	18.202	mg/kg	6.30	18.20	370	7100	no	no
F	8	8	100	Metals	Zinc, Total	60.325	mg/kg	7.17	60.33	1500	1500	no	no
G	56	56	100	Metals	Zinc, Total	73.184	mg/kg	37.05	73.18	1500	1500	no	no
H	56	56	100	Metals	Zinc, Total	67.138	mg/kg	22.45	67.14	1500	1500	no	no
I	4	4	100	Metals	Zinc, Total	627.275	mg/kg	1188.51	627.28	1500	1500	no	no
In situ	17	17	100.00	Metals	Zinc, Total	100.376	mg/kg	70.95	100.38	1500	1500	no	no
J	54	54	100	Metals	Zinc, Total	61.722	mg/kg	33.65	61.72	1500	1500	no	no
F	8	8	100	Pesticides	4,4'-DDD	27.938	µg/kg	11.69	0.03	3	12	no	no
G	53	51	96.226415	Pesticides	4,4'-DDD	24.837	µg/kg	45.92	0.02	3	12	no	no
H	50	40	80	Pesticides	4,4'-DDD	31.700	µg/kg	64.93	0.03	3	12	no	no
In situ	8	8	100.00	Pesticides	4,4'-DDD	9.775	µg/kg	1.84	0.01	3	12	no	no
J	51	44	86.27451	Pesticides	4,4'-DDD	12.415	µg/kg	23.66	0.01	3	12	no	no
F	8	7	87.5	Pesticides	4,4'-DDE	10.600	µg/kg	3.78	0.01	2	9	no	no
G	53	37	69.811321	Pesticides	4,4'-DDE	11.978	µg/kg	5.70	0.01	2	9	no	no
H	50	19	38	Pesticides	4,4'-DDE	12.779	µg/kg	6.90	0.01	2	9	no	no
I	4	3	75	Pesticides	4,4'-DDE	27	µg/kg	9.85	0.03	2	9	no	no
In situ	8	8	100.00	Pesticides	4,4'-DDE	3.873	µg/kg	2.01	0.00	2	9	no	no
J	51	22	43.137255	Pesticides	4,4'-DDE	6.856	µg/kg	5.69	0.01	2	9	no	no
F	8	5	62.5	Pesticides	4,4'-DDT	7.080	µg/kg	2.06	0.01	2	9	no	no
G	53	44	83.018868	Pesticides	4,4'-DDT	6.793	µg/kg	5.18	0.01	2	9	no	no
H	50	37	74	Pesticides	4,4'-DDT	8.643	µg/kg	9.72	0.01	2	9	no	no
I	4	3	75	Pesticides	4,4'-DDT	10.266667	µg/kg	1.62	0.01	2	9	no	no

Table 21
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Process Stockpile ID	Total Samples Collected	Count of Samples with Detected Results	% Samples with Detected Results	Analyte Group	Analysis Name	Average Result (units vary)	various units	Standard Deviation (results vary)	Average Result (mg/kg)	Direct Contact, Residential (mg/kg)	Direct Contact, Industrial (mg/kg)	Result > NJ Residential.?	Result > NJ Industrial.?
In situ	8	8	100.00	Pesticides	4,4'-DDT	4.150	µg/kg	1.18	0.00	2	9	no	no
J	51	34	66.666667	Pesticides	4,4'-DDT	3.366	µg/kg	2.36	0.00	2	9	no	no
F	8	8	100	Pesticides	Aldrin	4.228	µg/kg	3.78	0.00	0.04	0.17	no	no
G	53	31	58.490566	Pesticides	Aldrin	5.402	µg/kg	4.00	0.01	0.04	0.17	no	no
H	50	18	36	Pesticides	Aldrin	5.087	µg/kg	10.62	0.01	0.04	0.17	no	no
I	4	3	75	Pesticides	Aldrin	4.1666667	µg/kg	1.53	0.00	0.04	0.17	no	no
In situ	8	8	100.00	Pesticides	Aldrin	4.440	µg/kg	6.47	0.00	0.04	0.17		
J	51	16	31.372549	Pesticides	Aldrin	2.512	µg/kg	2.47	0.00	0.04	0.17	no	no
F	8	2	25	Pesticides	alpha-BHC	0.915	µg/kg	0.54	0.00			no	no
G	53	5	9.4339623	Pesticides	alpha-BHC	2.094	µg/kg	1.25	0.00			no	no
H	50	4	8	Pesticides	alpha-BHC	4.000	µg/kg	4.02	0.00			no	no
I	4	3	75	Pesticides	alpha-BHC	8.6333333	µg/kg	1.95	0.01			no	no
J	51	1	1.9607843	Pesticides	alpha-BHC	3.000	µg/kg	---	0.00			no	no
F	8	8	100	Pesticides	alpha-Chlordane	26.588	µg/kg	42.32	0.03			no	no
G	53	51	96.226415	Pesticides	alpha-Chlordane	16.640	µg/kg	12.60	0.02			no	no
H	50	48	96	Pesticides	alpha-Chlordane	19.069	µg/kg	22.71	0.02			no	no
I	4	4	100	Pesticides	alpha-Chlordane	6.475	µg/kg	2.51	0.01			no	no
In situ	8	8	100.00	Pesticides	alpha-Chlordane	13.385	µg/kg	11.75	0.01			yes	yes
J	51	44	86.27451	Pesticides	alpha-Chlordane	8.213	µg/kg	8.33	0.01			no	no
F	8	4	50	Pesticides	beta-BHC	4.425	µg/kg	3.36	0.00			no	no
G	53	10	18.867925	Pesticides	beta-BHC	3.660	µg/kg	1.88	0.00			no	no
H	50	4	8	Pesticides	beta-BHC	3.128	µg/kg	3.80	0.00			no	no
J	51	4	7.8431373	Pesticides	beta-BHC	1.678	µg/kg	0.95	0.00			no	no
F	8	4	50	Pesticides	delta-BHC	7.355	µg/kg	7.84	0.01			no	no
G	53	14	26.415094	Pesticides	delta-BHC	9.083	µg/kg	6.87	0.01			no	no
H	50	5	10	Pesticides	delta-BHC	8.200	µg/kg	4.69	0.01			no	no
I	4	2	50	Pesticides	delta-BHC	0.705	µg/kg	0.56	0.00			no	no
J	51	8	15.686275	Pesticides	delta-BHC	2.111	µg/kg	2.66	0.00			no	no
F	8	8	100	Pesticides	Dieldrin	3.600	µg/kg	1.72	0.00	0.042	0.18	no	no
G	53	34	64.150943	Pesticides	Dieldrin	5.135	µg/kg	3.73	0.01	0.042	0.18	no	no
H	50	22	44	Pesticides	Dieldrin	4.800	µg/kg	3.10	0.00	0.042	0.18	no	no
I	4	3	75	Pesticides	Dieldrin	1.8	µg/kg	0.17	0.00	0.042	0.18	no	no

Table 21
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Process Stockpile ID	Total Samples Collected	Count of Samples with Detected Results	% Samples with Detected Results	Analyte Group	Analysis Name	Average Result (units vary)	various units	Standard Deviation (results vary)	Average Result (mg/kg)	Direct Contact, Residential (mg/kg)	Direct Contact, Industrial (mg/kg)	Result > NJ Residential.?	Result > NJ Industrial.?
J	51	18	35.294118	Pesticides	Dieldrin	3.631	µg/kg	2.57	0.00	0.042	0.18	no	no
G	53	1	1.8867925	Pesticides	Endosulfan I	4.100	µg/kg	---	0.00	340	6200	no	no
H	50	1	2	Pesticides	Endosulfan I	1.000	µg/kg	---	0.00	340	6200	no	no
G	53	12	22.641509	Pesticides	Endosulfan II	4.125	µg/kg	4.98	0.00	340	6200	no	no
H	50	14	28	Pesticides	Endosulfan II	4.362	µg/kg	8.85	0.00	340	6200	no	no
J	51	10	19.607843	Pesticides	Endosulfan II	1.662	µg/kg	0.76	0.00	340	6200	no	no
F	8	8	100	Pesticides	Endosulfan Sulfate	3.875	µg/kg	4.16	0.00			no	no
G	53	36	67.924528	Pesticides	Endosulfan Sulfate	6.444	µg/kg	5.03	0.01			no	no
H	50	25	50	Pesticides	Endosulfan Sulfate	7.641	µg/kg	12.39	0.01			no	no
I	4	3	75	Pesticides	Endosulfan Sulfate	13.633333	µg/kg	4.99	0.01			no	no
J	51	26	50.980392	Pesticides	Endosulfan Sulfate	3.074	µg/kg	1.90	0.00			no	no
F	8	1	12.5	Pesticides	Endrin	8.300	µg/kg	---	0.01	17	310	no	no
G	53	3	5.6603774	Pesticides	Endrin	9.033	µg/kg	6.05	0.01	17	310	no	no
H	50	1	2	Pesticides	Endrin	100.000	µg/kg	---	0.10	17	310	no	no
I	4	2	50	Pesticides	Endrin	3	µg/kg	0.28	0.00	17	310	no	no
J	51	3	5.8823529	Pesticides	Endrin	13.100	µg/kg	12.94	0.01	17	310	no	no
G	53	3	5.6603774	Pesticides	Endrin aldehyde	13.667	µg/kg	13.32	0.01			no	no
H	50	2	4	Pesticides	Endrin aldehyde	22.000	µg/kg	12.73	0.02			no	no
J	51	1	1.9607843	Pesticides	Endrin aldehyde	31.000	µg/kg	---	0.03			no	no
F	8	4	50	Pesticides	Endrin ketone	7.850	µg/kg	2.80	0.01			no	no
G	53	10	18.867925	Pesticides	Endrin ketone	4.950	µg/kg	4.04	0.00			no	no
H	50	9	18	Pesticides	Endrin ketone	4.667	µg/kg	3.82	0.00			no	no
I	4	4	100	Pesticides	Endrin ketone	11.325	µg/kg	5.40	0.01			no	no
J	51	8	15.686275	Pesticides	Endrin ketone	3.550	µg/kg	2.34	0.00			no	no
F	8	2	25	Pesticides	gamma-BHC (Lindane)	0.980	µg/kg	0.17	0.00	0.52	2.2	no	no
G	53	12	22.641509	Pesticides	gamma-BHC (Lindane)	1.503	µg/kg	1.89	0.00	0.52	2.2	no	no
H	50	13	26	Pesticides	gamma-BHC (Lindane)	2.348	µg/kg	5.91	0.00	0.52	2.2	no	no
In situ	8	7	87.50	Pesticides	gamma-BHC (Lindane)	1.700	µg/kg	0.42	0.00	0.52	2.2		
J	51	1	1.9607843	Pesticides	gamma-BHC (Lindane)	0.420	µg/kg	---	0.00	0.52	2.2	no	no
F	8	8	100	Pesticides	gamma-Chlordane	17.888	µg/kg	31.78	0.02			no	no
G	53	49	92.45283	Pesticides	gamma-Chlordane	9.753	µg/kg	7.20	0.01			no	no
H	50	50	100	Pesticides	gamma-Chlordane	13.190	µg/kg	20.69	0.01			no	no

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I	4	4	100	Pesticides	gamma-Chlordane	4.725	µg/kg	0.81	0.00			no	no
In situ	8	8	100.00	Pesticides	gamma-Chlordane	6.708	µg/kg	5.89	0.01				
J	51	44	86.27451	Pesticides	gamma-Chlordane	5.159	µg/kg	7.33	0.01			no	no
F	8	1	12.5	Pesticides	Heptachlor	2.200	µg/kg	---	0.00	0.15	0.65	no	no
G	53	4	7.5471698	Pesticides	Heptachlor	2.270	µg/kg	1.52	0.00	0.15	0.65	no	no
H	50	18	36	Pesticides	Heptachlor	2.629	µg/kg	2.08	0.00	0.15	0.65	no	no
J	51	9	17.647059	Pesticides	Heptachlor	1.906	µg/kg	2.13	0.00	0.15	0.65	no	no
F	8	2	25	Pesticides	Heptachlor Epoxide	4.050	µg/kg	4.03	0.00			no	no
G	53	9	16.981132	Pesticides	Heptachlor Epoxide	3.303	µg/kg	4.12	0.00			no	no
H	50	9	18	Pesticides	Heptachlor Epoxide	3.238	µg/kg	2.41	0.00			no	no
I	4	2	50	Pesticides	Heptachlor Epoxide	2.85	µg/kg	0.64	0.00			no	no
In situ	8	8	100.00	Pesticides	Heptachlor Epoxide	13.950	µg/kg	16.78	0.01				
J	51	5	9.8039216	Pesticides	Heptachlor Epoxide	3.000	µg/kg	0.72	0.00			no	no
F	8	6	75	Pesticides	Methoxychlor	11.850	µg/kg	5.08	0.01	280	5200	no	no
G	53	19	35.849057	Pesticides	Methoxychlor	15.858	µg/kg	8.24	0.02	280	5200	no	no
H	50	15	30	Pesticides	Methoxychlor	16.480	µg/kg	8.29	0.02	280	5200	no	no
I	4	4	100	Pesticides	Methoxychlor	33	µg/kg	8.98	0.03	280	5200	no	no
J	51	15	29.411765	Pesticides	Methoxychlor	11.213	µg/kg	6.83	0.01	280	5200	no	no
G	50	2	4	SVOC	2,4-Dimethylphenol	8.000	µg/kg	4.24	0.01	1100	10000	no	no
H	53	1	1.8867925	SVOC	2,4-Dimethylphenol	9.000	µg/kg	---	0.01	1100	10000	no	no
F	8	4	50	SVOC	2-Methylnaphthalene	33.750	µg/kg	32.21	0.03			no	no
G	50	44	88	SVOC	2-Methylnaphthalene	69.545	µg/kg	136.66	0.07			no	no
H	53	35	66.037736	SVOC	2-Methylnaphthalene	37.514	µg/kg	31.43	0.04			no	no
I	4	2	50	SVOC	2-Methylnaphthalene	235	µg/kg	148.49	0.24			no	no
In situ	8	8	100.00	SVOC	2-Methylnaphthalene	58.429	µg/kg	120.13	0.06			yes	yes
J	51	23	45.098039	SVOC	2-Methylnaphthalene	49.739	µg/kg	95.28	0.05			no	no
G	50	11	22	SVOC	2-Methylphenol	219.818	µg/kg	592.98	0.22	2800	10000	no	no
H	53	4	7.5471698	SVOC	2-Methylphenol	24.000	µg/kg	13.83	0.02	2800	10000	no	no
In situ	8	7	87.50	SVOC	2-Methylphenol	10.500	µg/kg	2.12	0.01	2800	10000	no	no
J	51	4	7.8431373	SVOC	2-Methylphenol	176.750	µg/kg	145.40	0.18	2800	10000	no	no
G	50	1	2	SVOC	4-Chloroaniline	11.000	µg/kg	---	0.01	230	4200	no	no
F	8	2	25	SVOC	4-Methylphenol	43.500	µg/kg	2.12	0.04	2800	10000	no	no

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G	50	22	44	SVOC	4-Methylphenol	43.818	µg/kg	26.76	0.04	2800	10000	no	no
H	53	20	37.735849	SVOC	4-Methylphenol	68.050	µg/kg	45.94	0.07	2800	10000	no	no
In situ	8	7	87.50	SVOC	4-Methylphenol	68.500	µg/kg	102.07	0.07	2800	10000	no	no
In situ	8	7	87.50	SVOC	4-Methylphenol	1.100	µg/L	1.27		2800	10000		
J	51	9	17.647059	SVOC	4-Methylphenol	19.111	µg/kg	14.68	0.02	2800	10000	no	no
F	8	3	37.5	SVOC	Acenaphthene	95.000	µg/kg	116.91	0.10	3400	10000	no	no
G	50	43	86	SVOC	Acenaphthene	82.814	µg/kg	213.18	0.08	3400	10000	no	no
H	53	38	71.698113	SVOC	Acenaphthene	63.947	µg/kg	55.61	0.06	3400	10000	no	no
In situ	8	8	100.00	SVOC	Acenaphthene	82.167	µg/kg	101.31	0.08	3400	10000		
J	51	20	39.215686	SVOC	Acenaphthene	105.700	µg/kg	154.18	0.11	3400	10000	no	no
F	8	7	87.5	SVOC	Acenaphthylene	53.714	µg/kg	28.22	0.05			no	no
G	50	49	98	SVOC	Acenaphthylene	89.531	µg/kg	73.95	0.09			no	no
H	53	53	100	SVOC	Acenaphthylene	98.566	µg/kg	89.06	0.10			no	no
I	4	2	50	SVOC	Acenaphthylene	265	µg/kg	63.64	0.27			no	no
In situ	8	8	100.00	SVOC	Acenaphthylene	198.000	µg/kg	446.05	0.20	10000	10000	no	no
J	51	45	88.235294	SVOC	Acenaphthylene	124.111	µg/kg	360.61	0.12			no	no
F	8	7	87.5	SVOC	Anthracene	143.857	µg/kg	141.94	0.14	10000	10000	no	no
G	50	50	100	SVOC	Anthracene	227.200	µg/kg	570.72	0.23	10000	10000	no	no
H	53	53	100	SVOC	Anthracene	189.906	µg/kg	161.95	0.19	10000	10000	no	no
I	4	2	50	SVOC	Anthracene	520	µg/kg	56.57	0.52	10000	10000	no	no
In situ	8	8	100.00	SVOC	Anthracene	268.000	µg/kg	543.15	0.27	0.9	4	no	no
J	51	48	94.117647	SVOC	Anthracene	226.000	µg/kg	582.71	0.23	10000	10000	no	no
F	8	7	87.5	SVOC	Benzo(a)anthracene	254.286	µg/kg	217.63	0.25	0.9	4	no	no
G	50	49	98	SVOC	Benzo(a)anthracene	452.571	µg/kg	919.27	0.45	0.9	4	no	no
H	53	53	100	SVOC	Benzo(a)anthracene	426.434	µg/kg	350.62	0.43	0.9	4	no	no
I	4	2	50	SVOC	Benzo(a)anthracene	555	µg/kg	77.78	0.56	0.9	4	no	no
In situ	8	8	100.00	SVOC	Benzo(a)anthracene	524.500	µg/kg	855.58	0.52	0.66	0.66	no	no
J	51	50	98.039216	SVOC	Benzo(a)anthracene	350.020	µg/kg	934.96	0.35	0.9	4	no	no
F	8	7	87.5	SVOC	Benzo(a)pyrene	258.571	µg/kg	206.92	0.26	0.66	0.66	no	no
G	50	50	100	SVOC	Benzo(a)pyrene	384.700	µg/kg	590.95	0.38	0.66	0.66	no	no
H	53	52	98.113208	SVOC	Benzo(a)pyrene	371.769	µg/kg	257.81	0.37	0.66	0.66	no	no
In situ	8	8	100.00	SVOC	Benzo(a)pyrene	400.750	µg/kg	544.78	0.40	0.9	4	no	no

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J	51	46	90.196078	SVOC	Benzo(a)pyrene	338.826	µg/kg	813.61	0.34	0.66	0.66	no	no
F	8	7	87.5	SVOC	Benzo(b)fluoranthene	205.714	µg/kg	166.82	0.21	0.9	4	no	no
G	50	49	98	SVOC	Benzo(b)fluoranthene	316.469	µg/kg	450.86	0.32	0.9	4	no	no
H	53	52	98.113208	SVOC	Benzo(b)fluoranthene	317.712	µg/kg	221.94	0.32	0.9	4	no	no
I	4	2	50	SVOC	Benzo(b)fluoranthene	300	µg/kg	84.85	0.30	0.9	4	no	no
In situ	8	8	100.00	SVOC	Benzo(b)fluoranthene	288.125	µg/kg	344.67	0.29			no	no
J	51	47	92.156863	SVOC	Benzo(b)fluoranthene	272.851	µg/kg	638.39	0.27	0.9	4	no	no
F	8	7	87.5	SVOC	Benzo(g,h,i)perylene	205.143	µg/kg	182.62	0.21			no	no
G	50	48	96	SVOC	Benzo(g,h,i)perylene	318.958	µg/kg	285.38	0.32			no	no
H	53	50	94.339623	SVOC	Benzo(g,h,i)perylene	338.300	µg/kg	209.81	0.34			no	no
I	4	2	50	SVOC	Benzo(g,h,i)perylene	150	µg/kg	42.43	0.15			no	no
In situ	8	8	100.00	SVOC	Benzo(g,h,i)perylene	307.250	µg/kg	347.41	0.31	0.9	4	no	no
J	51	40	78.431373	SVOC	Benzo(g,h,i)perylene	326.625	µg/kg	768.16	0.33			no	no
F	8	7	87.5	SVOC	Benzo(k)fluoranthene	275.714	µg/kg	226.93	0.28	0.9	4	no	no
G	50	50	100	SVOC	Benzo(k)fluoranthene	371.160	µg/kg	520.18	0.37	0.9	4	no	no
H	53	52	98.113208	SVOC	Benzo(k)fluoranthene	365.000	µg/kg	246.36	0.37	0.9	4	no	no
In situ	8	8	100.00	SVOC	Benzo(k)fluoranthene	309.750	µg/kg	344.20	0.31	49	210	no	no
J	51	47	92.156863	SVOC	Benzo(k)fluoranthene	296.426	µg/kg	649.84	0.30	0.9	4	no	no
F	8	4	50	SVOC	bis(2-Ethylhexyl)phthalate	109.500	µg/kg	27.59	0.11	49	210	no	no
G	50	35	70	SVOC	bis(2-Ethylhexyl)phthalate	135.343	µg/kg	153.00	0.14	49	210	no	no
H	53	37	69.811321	SVOC	bis(2-Ethylhexyl)phthalate	172.514	µg/kg	149.46	0.17	49	210	no	no
I	4	2	50	SVOC	bis(2-Ethylhexyl)phthalate	33.5	µg/kg	16.26	0.03	49	210	no	no
In situ	8	8	100.00	SVOC	bis(2-Ethylhexyl)phthalate	75.625	µg/kg	14.26	0.08			no	no
J	51	26	50.980392	SVOC	bis(2-Ethylhexyl)phthalate	125.885	µg/kg	146.41	0.13	49	210	no	no
H	53	1	1.8867925	SVOC	Butyl benzyl phthalate	44.000	µg/kg	---	0.04	1100	10000	no	no
In situ	8	8	100.00	SVOC	Carbazole	49.625	µg/kg	85.94	0.05	9	40	no	no
F	8	7	87.5	SVOC	Chrysene	345.714	µg/kg	287.68	0.35	9	40	no	no
G	50	49	98	SVOC	Chrysene	562.755	µg/kg	954.96	0.56	9	40	no	no
H	53	53	100	SVOC	Chrysene	506.849	µg/kg	370.32	0.51	9	40	no	no
I	4	2	50	SVOC	Chrysene	660	µg/kg	98.99	0.66	9	40	no	no
In situ	8	8	100.00	SVOC	Chrysene	620.500	µg/kg	1019.00	0.62	5700	10000	no	no
J	51	50	98.039216	SVOC	Chrysene	414.320	µg/kg	1063.31	0.41	9	40	no	no

Table 21
Chemical Sample Evaluation

Process Stockpile ID	Total Samples Collected	Count of Samples with Detected Results	% Samples with Detected Results	Analyte Group	Analysis Name	Average Result (units vary)	various units	Standard Deviation (results vary)	Average Result (mg/kg)	Direct Contact, Residential (mg/kg)	Direct Contact, Industrial (mg/kg)	Result > NJ Residential.?	Result > NJ Industrial.?
F	8	5	62.5	SVOC	Dibenzofuran	44.400	µg/kg	59.15	0.04			no	no
G	50	44	88	SVOC	Dibenzofuran	56.909	µg/kg	117.88	0.06			no	no
H	53	42	79.245283	SVOC	Dibenzofuran	41.167	µg/kg	41.03	0.04			no	no
I	4	2	50	SVOC	Dibenzofuran	96	µg/kg	19.80	0.10			no	no
In situ	8	8	100.00	SVOC	Dibenzofuran	47.714	µg/kg	79.83	0.05	2300	10000	no	no
J	51	24	47.058824	SVOC	Dibenzofuran	67.500	µg/kg	104.31	0.07			no	no
G	50	5	10	SVOC	Diethylphthalate	15.400	µg/kg	3.29	0.02	10000	10000	no	no
H	53	3	5.6603774	SVOC	Diethylphthalate	226.333	µg/kg	375.57	0.23	10000	10000	no	no
J	51	7	13.72549	SVOC	Diethylphthalate	15.714	µg/kg	14.04	0.02	10000	10000	no	no
G	50	1	2	SVOC	Dimethylphthalate	86.000	µg/kg	---	0.09	10000	10000	no	no
G	50	15	30	SVOC	Di-n-butylphthalate	29.800	µg/kg	26.37	0.03	5700	10000	no	no
H	53	9	16.981132	SVOC	Di-n-butylphthalate	14.111	µg/kg	13.72	0.01	5700	10000	no	no
In situ	8	8	100.00	SVOC	Di-n-butylphthalate	7.400	µg/kg	2.51	0.01			no	no
J	51	12	23.529412	SVOC	Di-n-butylphthalate	23.333	µg/kg	21.79	0.02	5700	10000	no	no
G	50	1	2	SVOC	Di-n-octylphthalate	18.000	µg/kg	---	0.02	1100	10000	no	no
J	51	1	1.9607843	SVOC	Di-n-octylphthalate	59.000	µg/kg	---	0.06	1100	10000	no	no
F	8	7	87.5	SVOC	Fluoranthene	421.429	µg/kg	392.19	0.42	2300	10000	no	no
G	50	50	100	SVOC	Fluoranthene	707.200	µg/kg	1114.25	0.71	2300	10000	no	no
H	53	53	100	SVOC	Fluoranthene	651.698	µg/kg	570.66	0.65	2300	10000	no	no
I	4	2	50	SVOC	Fluoranthene	940	µg/kg	84.85	0.94	2300	10000	no	no
In situ	8	8	100.00	SVOC	Fluoranthene	814.125	µg/kg	1320.39	0.81	2300	10000	no	no
J	51	51	100	SVOC	Fluoranthene	559.471	µg/kg	1263.09	0.56	2300	10000	no	no
F	8	7	87.5	SVOC	Fluorene	70.571	µg/kg	84.05	0.07	2300	10000	no	no
G	50	49	98	SVOC	Fluorene	100.796	µg/kg	219.75	0.10	2300	10000	no	no
H	53	46	86.792453	SVOC	Fluorene	75.522	µg/kg	81.96	0.08	2300	10000	no	no
I	4	2	50	SVOC	Fluorene	305	µg/kg	120.21	0.31	2300	10000	no	no
In situ	8	8	100.00	SVOC	Fluorene	199.333	µg/kg	394.44	0.20	0.9	4	no	no
J	51	32	62.745098	SVOC	Fluorene	148.063	µg/kg	289.34	0.15	2300	10000	no	no
F	8	7	87.5	SVOC	Indeno(1,2,3-cd)pyrene	198.857	µg/kg	181.21	0.20	0.9	4	no	no
G	50	49	98	SVOC	Indeno(1,2,3-cd)pyrene	314.857	µg/kg	344.28	0.31	0.9	4	no	no
H	53	50	94.339623	SVOC	Indeno(1,2,3-cd)pyrene	313.380	µg/kg	207.07	0.31	0.9	4	no	no
I	4	2	50	SVOC	Indeno(1,2,3-cd)pyrene	155	µg/kg	21.21	0.16	0.9	4	no	no

Table 21
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In situ	8	8	100.00	SVOC	Indeno(1,2,3-cd)pyrene	256.125	µg/kg	294.31	0.26	230	4200	no	no
J	51	42	82.352941	SVOC	Indeno(1,2,3-cd)pyrene	270.024	µg/kg	603.41	0.27	0.9	4	no	no
G	50	6	12	SVOC	Isophorone	5.833	µg/kg	1.47	0.01	1100	10000	no	no
H	53	4	7.5471698	SVOC	Isophorone	7.250	µg/kg	2.06	0.01	1100	10000	no	no
J	51	6	11.764706	SVOC	Isophorone	4.000	µg/kg	0.00	0.00	1100	10000	no	no
F	8	1	12.5	SVOC	Naphthalene	170.000	µg/kg	---	0.17	230	4200	no	no
G	50	40	80	SVOC	Naphthalene	43.775	µg/kg	64.47	0.04	230	4200	no	no
H	53	39	73.584906	SVOC	Naphthalene	32.641	µg/kg	25.28	0.03	230	4200	no	no
I	4	2	50	SVOC	Naphthalene	124	µg/kg	50.91	0.12	230	4200	no	no
In situ	8	8	100.00	SVOC	Naphthalene	30.625	µg/kg	56.72	0.03			no	no
J	51	23	45.098039	SVOC	Naphthalene	31.609	µg/kg	42.11	0.03	230	4200	no	no
J	51	1	1.9607843	SVOC	Nitrobenzene	13.000	µg/kg	---	0.01	28	520	no	no
F	8	7	87.5	SVOC	Phenanthrene	498.571	µg/kg	535.80	0.50			no	no
G	50	49	98	SVOC	Phenanthrene	826.735	µg/kg	1930.24	0.83			no	no
H	53	53	100	SVOC	Phenanthrene	545.585	µg/kg	531.74	0.55			no	no
I	4	2	50	SVOC	Phenanthrene	1800	µg/kg	424.26	1.80			no	no
In situ	8	8	100.00	SVOC	Phenanthrene	1096.500	µg/kg	2473.95	1.10	10000	10000	no	no
J	51	51	100	SVOC	Phenanthrene	675.078	µg/kg	1697.10	0.68			no	no
G	50	18	36	SVOC	Phenol	55.833	µg/kg	108.71	0.06	10000	10000	no	no
H	53	17	32.075472	SVOC	Phenol	38.824	µg/kg	33.49	0.04	10000	10000	no	no
In situ	8	8	100.00	SVOC	Phenol	12.000	µg/kg	11.65	0.01	1700	10000	no	no
J	51	9	17.647059	SVOC	Phenol	18.556	µg/kg	27.96	0.02	10000	10000	no	no
F	8	7	87.5	SVOC	Pyrene	650.000	µg/kg	431.35	0.65	1700	10000	no	no
G	50	50	100	SVOC	Pyrene	957.000	µg/kg	1700.31	0.96	1700	10000	no	no
H	53	51	96.226415	SVOC	Pyrene	900.196	µg/kg	688.24	0.90	1700	10000	no	no
I	4	2	50	SVOC	Pyrene	1015	µg/kg	120.21	1.02	1700	10000	no	no
In situ	8	8	100.00	SVOC	Pyrene	1282.875	µg/kg	2271.15	1.28			no	no
J	51	51	100	SVOC	Pyrene	716.784	µg/kg	1716.76	0.72	1700	10000	no	no
In situ	17	8	47.06	VOC	1,1,1-Trichloroethane	1062.500	µg/kg	606.93	1.06	34	70	no	no
G	56	17	30.357143	VOC	1,1,2,2-Tetrachloroethane	3.853	µg/kg	4.05	0.00	34	70	no	no
H	56	16	28.571429	VOC	1,1,2,2-Tetrachloroethane	3.994	µg/kg	6.60	0.00	34	70	no	no
In situ	17	8	47.06	VOC	1,1,2,2-Tetrachloroethane	1062.500	µg/kg	606.93	1.06	22	420	no	no

Table 21
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G	56	2	3.5714286	VOC	1,1,2-Trichloroethane	7.000	µg/kg	7.07	0.01	22	420	no	no
H	56	5	8.9285714	VOC	1,1,2-Trichloroethane	6.200	µg/kg	6.26	0.01	22	420	no	no
In situ	17	8	47.06	VOC	1,1,2-Trichloroethane	1062.500	µg/kg	606.93	1.06	570	1000	no	no
In situ	17	8	47.06	VOC	1,1-Dichloroethane	1062.500	µg/kg	606.93	1.06	8	150	no	no
G	56	2	3.5714286	VOC	1,1-Dichloroethene	2.000	µg/kg	0.00	0.00	8	150	no	no
H	56	1	1.7857143	VOC	1,1-Dichloroethene	2.000	µg/kg	---	0.00	8	150	no	no
In situ	17	8	47.06	VOC	1,1-Dichloroethene	1062.500	µg/kg	606.93	1.06	6	24	no	no
G	56	1	1.7857143	VOC	1,2-Dichloroethane	4.000	µg/kg	---	0.00	6	24	no	no
In situ	17	8	47.06	VOC	1,2-Dichloroethane	1062.500	µg/kg	606.93	1.06	79	1000	no	no
G	56	14	25	VOC	1,2-Dichloroethene (cis)	1.636	µg/kg	2.32	0.00	79	1000	no	no
H	56	8	14.285714	VOC	1,2-Dichloroethene (cis)	2.025	µg/kg	1.45	0.00	79	1000	no	no
In situ	17	8	47.06	VOC	1,2-Dichloroethene (total)	1062.500	µg/kg	606.93	1.06	10	43	no	no
G	56	1	1.7857143	VOC	1,2-Dichloroethene (trans)	1.000	µg/kg	---	0.00	1000	1000	no	no
In situ	17	8	47.06	VOC	1,2-Dichloropropane	1062.500	µg/kg	606.93	1.06	1000	1000	no	no
G	56	25	44.642857	VOC	2-Butanone	6.520	µg/kg	4.06	0.01	1000	1000	no	no
H	56	24	42.857143	VOC	2-Butanone	11.792	µg/kg	---	0.01	1000	1000	no	no
In situ	17	8	47.06	VOC	2-Butanone	2125.000	µg/kg	1229.11	2.13	1000	1000	no	no
In situ	17	7	41.18	VOC	2-Butanone	19.000	µg/L	8.49					
J	3	3	100	VOC	2-Butanone	8.667	µg/kg	2.08	0.01	1000	1000	no	no
H	56	1	1.7857143	VOC	2-Hexanone	3.000	µg/kg		0.00			no	no
In situ	17	8	47.06	VOC	2-Hexanone	2125.000	µg/kg	1229.11	2.13	1000	1000	no	no
F	8	8	100	VOC	4-Methyl-2-Pentanone	3.613	µg/kg	3.08	0.00	1000	1000	no	no
G	56	27	48.214286	VOC	4-Methyl-2-Pentanone	2.952	µg/kg	2.63	0.00	1000	1000	no	no
H	56	25	44.642857	VOC	4-Methyl-2-Pentanone	4.228	µg/kg	3.03	0.00	1000	1000	no	no
I	4	3	75	VOC	4-Methyl-2-Pentanone	1.9666667	µg/kg	1.05	0.00	1000	1000	no	no
In situ	17	8	47.06	VOC	4-Methyl-2-pentanone	2125.000	µg/kg	1229.11	2.13	1000	1000	no	no
J	3	3	100	VOC	4-Methyl-2-Pentanone	4.000	µg/kg	3.46	0.00	1000	1000	no	no
F	8	7	87.5	VOC	Acetone	21.429	µg/kg	9.83	0.02	1000	1000	no	no
G	56	49	87.5	VOC	Acetone	50.571	µg/kg	29.35	0.05	1000	1000	no	no
H	56	55	98.214286	VOC	Acetone	63.364	µg/kg	37.39	0.06	1000	1000	no	no
I	4	3	75	VOC	Acetone	40.666667	µg/kg	25.32	0.04	1000	1000	no	no
In situ	17	9	52.94	VOC	Acetone	1516.667	µg/kg	1419.87	1.52	3	13	no	no

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J	3	3	100	VOC	Acetone	44.667	µg/kg	7.37	0.04	1000	1000	no	no
F	8	7	87.5	VOC	Benzene	0.929	µg/kg	0.15	0.00	3	13	no	no
G	56	45	80.357143	VOC	Benzene	2.400	µg/kg	2.12	0.00	3	13	no	no
H	56	44	78.571429	VOC	Benzene	1.811	µg/kg	1.92	0.00	3	13	no	no
I	4	3	75	VOC	Benzene	0.7	µg/kg	0.26	0.00	3	13	no	no
In situ	17	8	47.06	VOC	Benzene	1062.500	µg/kg	606.93	1.06	11	46	no	no
J	3	2	66.666667	VOC	Benzene	3.500	µg/kg	0.71	0.00	3	13	no	no
In situ	17	8	47.06	VOC	Bromodichloromethane	1062.500	µg/kg	606.93	1.06	86	370	no	no
In situ	17	8	47.06	VOC	Bromoform	1062.500	µg/kg	606.93	1.06	79	1000	no	no
In situ	17	8	47.06	VOC	Bromomethane	2125.000	µg/kg	1229.11	2.13	0.62	0.62	yes	yes
F	8	6	75	VOC	Carbon Disulfide	0.783	µg/kg	0.21	0.00	0.62	0.62	no	no
G	56	33	58.928571	VOC	Carbon Disulfide	1.309	µg/kg	0.60	0.00	0.62	0.62	no	no
H	56	32	57.142857	VOC	Carbon Disulfide	1.450	µg/kg	1.29	0.00	0.62	0.62	no	no
I	4	2	50	VOC	Carbon Disulfide	4.5	µg/kg	4.95	0.00	0.62	0.62	no	no
In situ	17	8	47.06	VOC	Carbon Disulfide	1062.500	µg/kg	606.93	1.06	2	4	no	no
J	3	2	66.666667	VOC	Carbon Disulfide	1.000	µg/kg	0.00	0.00	0.62	0.62	no	no
In situ	17	8	47.06	VOC	Carbon Tetrachloride	1062.500	µg/kg	606.93	1.06	37	680	no	no
H	56	1	1.7857143	VOC	Chlorobenzene	0.900	µg/kg	---	0.00	37	680	no	no
In situ	17	8	47.06	VOC	Chlorobenzene	1062.500	µg/kg	606.93	1.06				
In situ	17	8	47.06	VOC	Chloroethane	2125.000	µg/kg	1229.11	2.13	19	28	no	no
H	56	3	5.3571429	VOC	Chloroform	0.567	µg/kg	0.21	0.00	19	28	no	no
In situ	17	8	47.06	VOC	Chloroform	1062.500	µg/kg	606.93	1.06	19	28	no	no
In situ	17	8	47.06	VOC	Chloroform	1.286	µg/L	0.49					
In situ	17	8	47.06	VOC	Chloromethane	2125.000	µg/kg	1229.11	2.13	4	5	no	no
In situ	17	8	47.06	VOC	cis-1,3-Dichloropropene	1062.500	µg/kg	606.93	1.06	110	1000	no	no
In situ	17	8	47.06	VOC	Dibromochloromethane	1062.500	µg/kg	606.93	1.06	1000	1000	no	no
G	56	1	1.7857143	VOC	Ethylbenzene	0.900	µg/kg	---	0.00	1000	1000	no	no
H	56	16	28.571429	VOC	Ethylbenzene	0.763	µg/kg	0.46	0.00	1000	1000	no	no
In situ	17	8	47.06	VOC	Ethylbenzene	1062.500	µg/kg	606.93	1.06	49	210	no	no
F	8	8	100	VOC	Methylene Chloride	15.750	µg/kg	1.98	0.02	49	210	no	no
G	56	45	80.357143	VOC	Methylene Chloride	7.422	µg/kg	5.79	0.01	49	210	no	no
H	56	39	69.642857	VOC	Methylene Chloride	6.487	µg/kg	3.24	0.01	49	210	no	no

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I	4	3	75	VOC	Methylene Chloride	15	µg/kg	4.36	0.02	49	210	no	no
In situ	17	8	47.06	VOC	Methylene Chloride	1796.250	µg/kg	1074.14	1.80	23	97	no	no
J	3	2	66.666667	VOC	Methylene Chloride	6.500	µg/kg	0.71	0.01	49	210	no	no
G	56	4	7.1428571	VOC	Styrene	0.325	µg/kg	0.26	0.00	23	97	no	no
H	56	5	8.9285714	VOC	Styrene	1.040	µg/kg	0.58	0.00	23	97	no	no
In situ	17	8	47.06	VOC	Styrene	1062.500	µg/kg	606.93	1.06	4	6	no	no
G	56	7	12.5	VOC	Tetrachloroethene	3.571	µg/kg	2.57	0.00	4	6	no	no
H	56	6	10.714286	VOC	Tetrachloroethene	3.167	µg/kg	1.60	0.00	4	6	no	no
In situ	17	8	47.06	VOC	Tetrachloroethene	1062.500	µg/kg	606.93	1.06	1000	1000	no	no
F	8	8	100	VOC	Toluene	1.500	µg/kg	0.93	0.00	1000	1000	no	no
G	56	48	85.714286	VOC	Toluene	4.867	µg/kg	8.51	0.00	1000	1000	no	no
H	56	51	91.071429	VOC	Toluene	4.990	µg/kg	5.38	0.00	1000	1000	no	no
I	4	3	75	VOC	Toluene	2.3333333	µg/kg	0.58	0.00	1000	1000	no	no
In situ	17	8	47.06	VOC	Toluene	1062.500	µg/kg	606.93	1.06	410	1000	no	no
J	3	2	66.666667	VOC	Toluene	3.500	µg/kg	0.71	0.00	1000	1000	no	no
G	56	25	44.642857	VOC	Total Xylene	1.092	µg/kg	0.63	0.00	410	1000	no	no
H	56	38	67.857143	VOC	Total Xylene	1.561	µg/kg	1.55	0.00	410	1000	no	no
In situ	17	9	52.94	VOC	Total Xylene	968.889	µg/kg	633.39	0.97				
In situ	17	8	47.06	VOC	Trans-1,3-Dichloropropene	1062.500	µg/kg	606.93	1.06	23	54	no	no
G	56	24	42.857143	VOC	Trichloroethene	1.133	µg/kg	0.72	0.00	23	54	no	no
H	56	13	23.214286	VOC	Trichloroethene	1.231	µg/kg	0.57	0.00	23	54	no	no
In situ	17	8	47.06	VOC	Trichloroethene	1062.500	µg/kg	606.93	1.06	2	7	no	no
J	3	1	33.333333	VOC	Trichloroethene	1.000	µg/kg	---	0.00	23	54	no	no
In situ	17	8	47.06	VOC	Vinyl Chloride	2125.000	µg/kg	1229.11	2.13			yes	yes
G	50	2	4.00	PCBs	Aroclor-1242	17.50	µg/kg	3.54	0.02	0.49	2	no	no
H	53	3	5.66	PCBs	Aroclor-1242	36.67	µg/kg	8.08	0.04	0.49	2	no	no
F	7	2	28.57	PCBs	Aroclor-1248	70.00	µg/kg	7.07	0.07	0.49	2	no	no
G	50	14	28.00	PCBs	Aroclor-1248	85.07	µg/kg	43.46	0.09	0.49	2	no	no
J	51	3	5.88	PCBs	Aroclor-1248	74.67	µg/kg	54.52	0.07	0.49	2	no	no
G	50	22	44.00	PCBs	Aroclor-1254	41.09	µg/kg	31.08	0.04	0.49	2	no	no
H	53	40	75.47	PCBs	Aroclor-1254	65.16	µg/kg	169.74	0.07	0.49	2	no	no

Table 21
Chemical Sample Evaluation

Process Stockpile ID	Total Samples Collected	Count of Samples with Detected Results	% Samples with Detected Results	Analyte Group	Analysis Name	Average Result (units vary)	various units	Standard Deviation (results vary)	Average Result (mg/kg)	Direct Contact, Residential (mg/kg)	Direct Contact, Industrial (mg/kg)	Result > NJ Residential.?	Result > NJ Industrial.?
In situ	10	2	20.00	PCBs	Aroclor-1254	20.50	µg/kg	6.36	0.02	0.49	2	no	no
J	51	15	29.41	PCBs	Aroclor-1254	25.88	µg/kg	30.73	0.03	0.49	2	no	no
F	7	7	100.00	PCBs	Aroclor-1260	29.71	µg/kg	22.02	0.03	0.49	2	no	no
G	50	37	74.00	PCBs	Aroclor-1260	25.21	µg/kg	22.29	0.03	0.49	2	no	no
H	53	43	81.13	PCBs	Aroclor-1260	35.88	µg/kg	39.37	0.04	0.49	2	no	no
I	2	2	100.00	PCBs	Aroclor-1260	6.75	µg/kg	1.63	0.01	0.49	2	no	no
In situ	10	7	70.00	PCBs	Aroclor-1260	14.34	µg/kg	7.06	0.01	0.49	2	no	no
J	51	25	49.02	PCBs	Aroclor-1260	13.02	µg/kg	10.05	0.01	0.49	2	no	no

Notes:
mg/kg – milligram per kilogram
µg/kg – microgram per kilogram

FIGURES

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Figure 1
Site Location Map

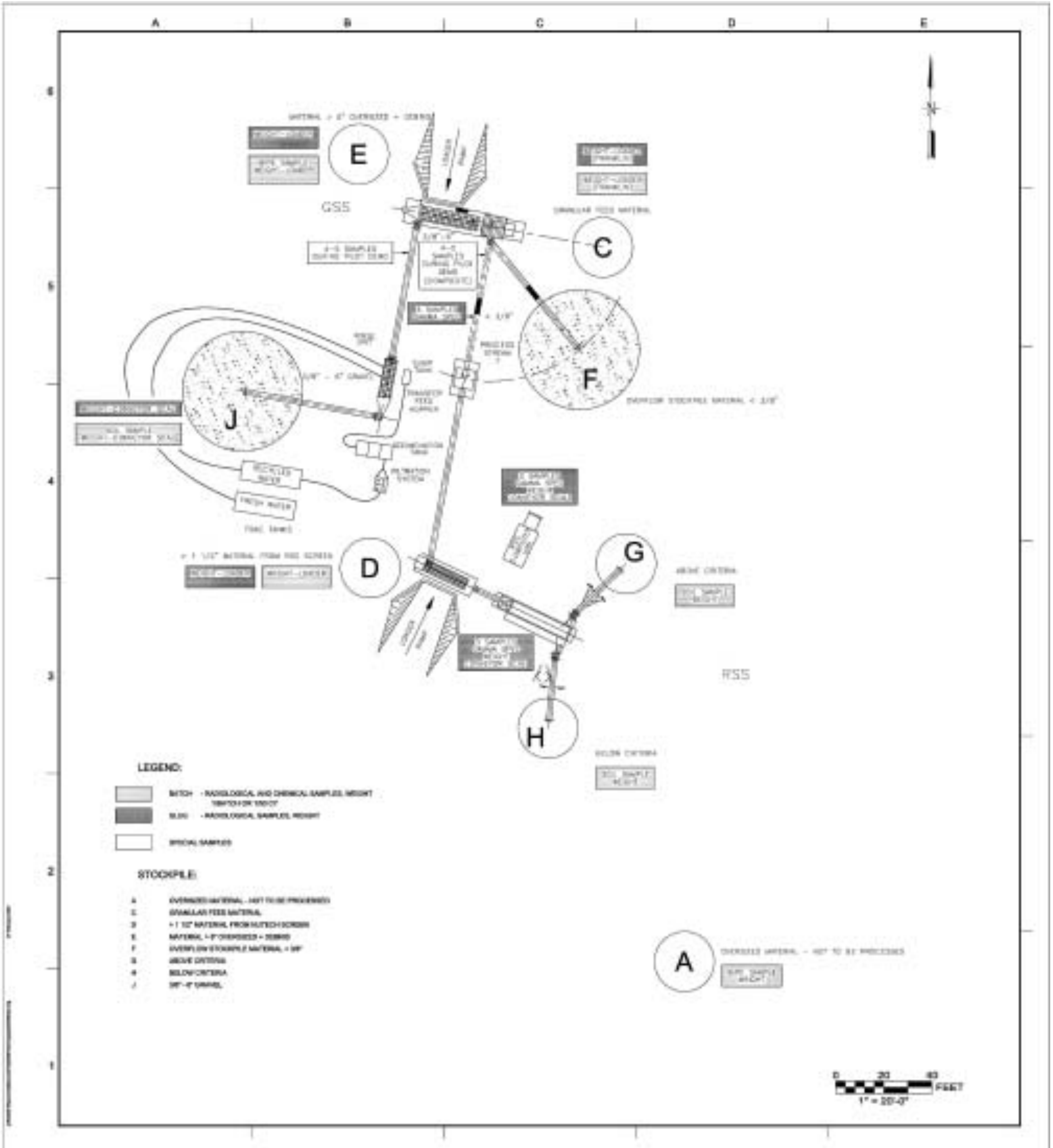

Figure 2
Pilot Plant Demonstration Systems Layout

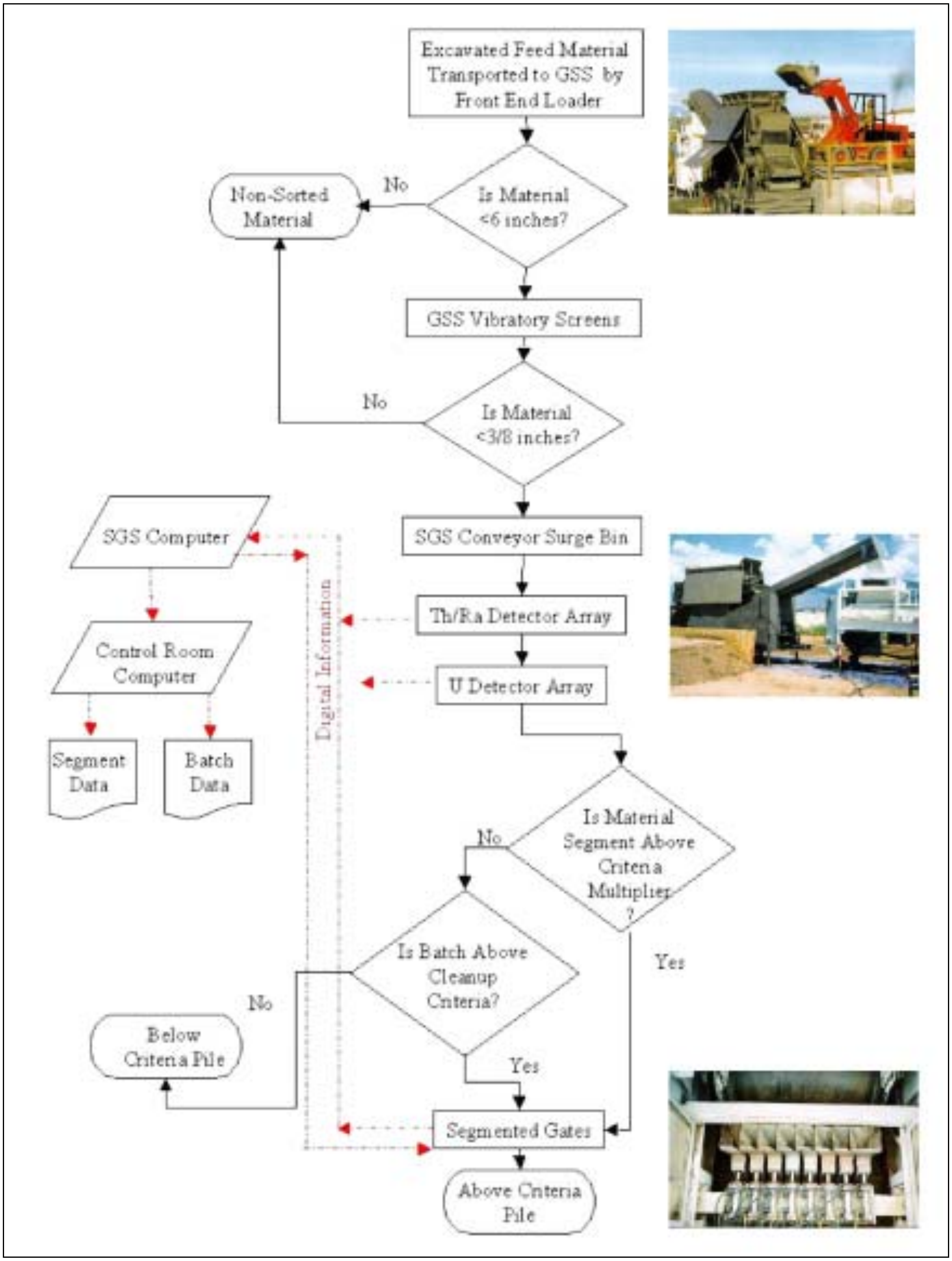

Figure 3
RSS Process Flow Schematic

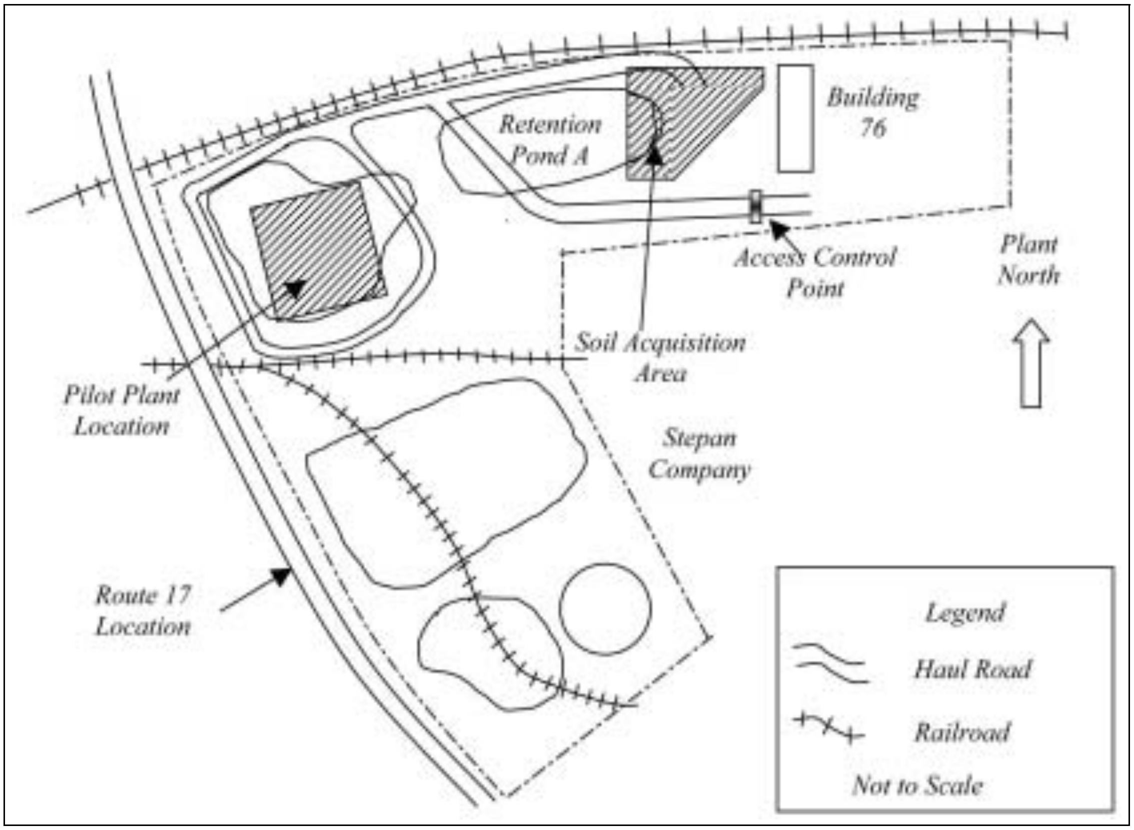

Figure 4
Project Layout

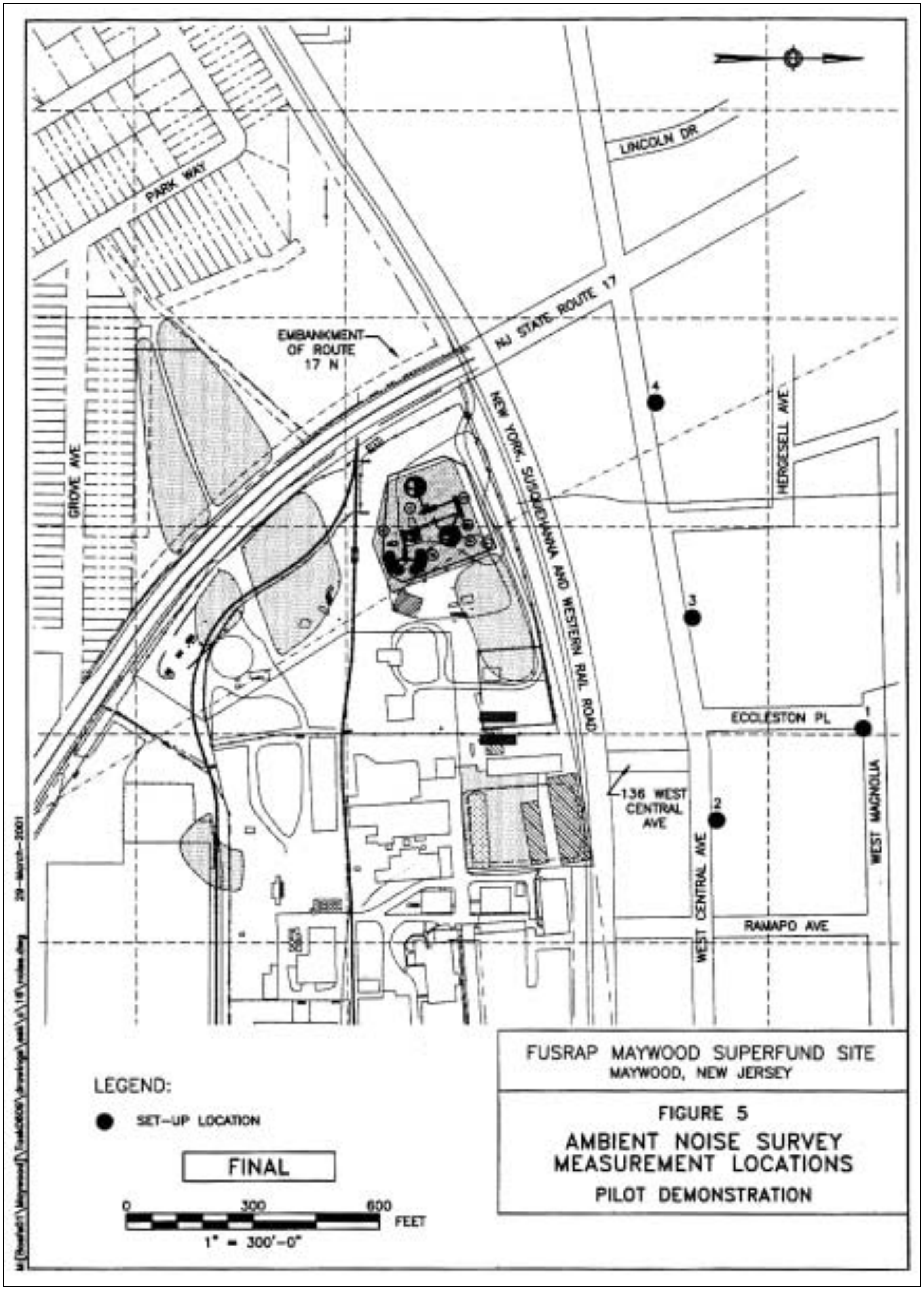

Figure 5
Ambient Noise Survey Measurement Locations, Pilot Demonstration

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APPENDICES

(Appendices A-L are contained on CD)

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Treatment Demonstration Report Appendices A – L

New York District
Formerly Utilized Sites Remedial Action Program
Maywood Superfund Site

Prepared by:
Stone & Webster, Inc.
100 West Hunter Ave.
Maywood, New Jersey 07607

for:
US Army Corps of Engineers - Kansas City District
Formerly Utilized Sites Remedial Action Program
Contract No. DACW41-99-D-9001

US Army Corps
of Engineers

February 2003, Revision 0

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APPENDIX A
PILOT DEMONSTRATION PHOTOGRAPHS

FUSRAP Maywood Superfund Site
Maywood, New Jersey
Contract No. DACW41-99-D-9001
Pilot Plant Demonstration / Soils Acquisition Photos

Pilot Demonstration Plant Layout

FUSRAP Maywood Superfund Site
Maywood, New Jersey
Contract No. DACW41-99-D-9001
Pilot Plant Demonstration / Soils Acquisition Photos

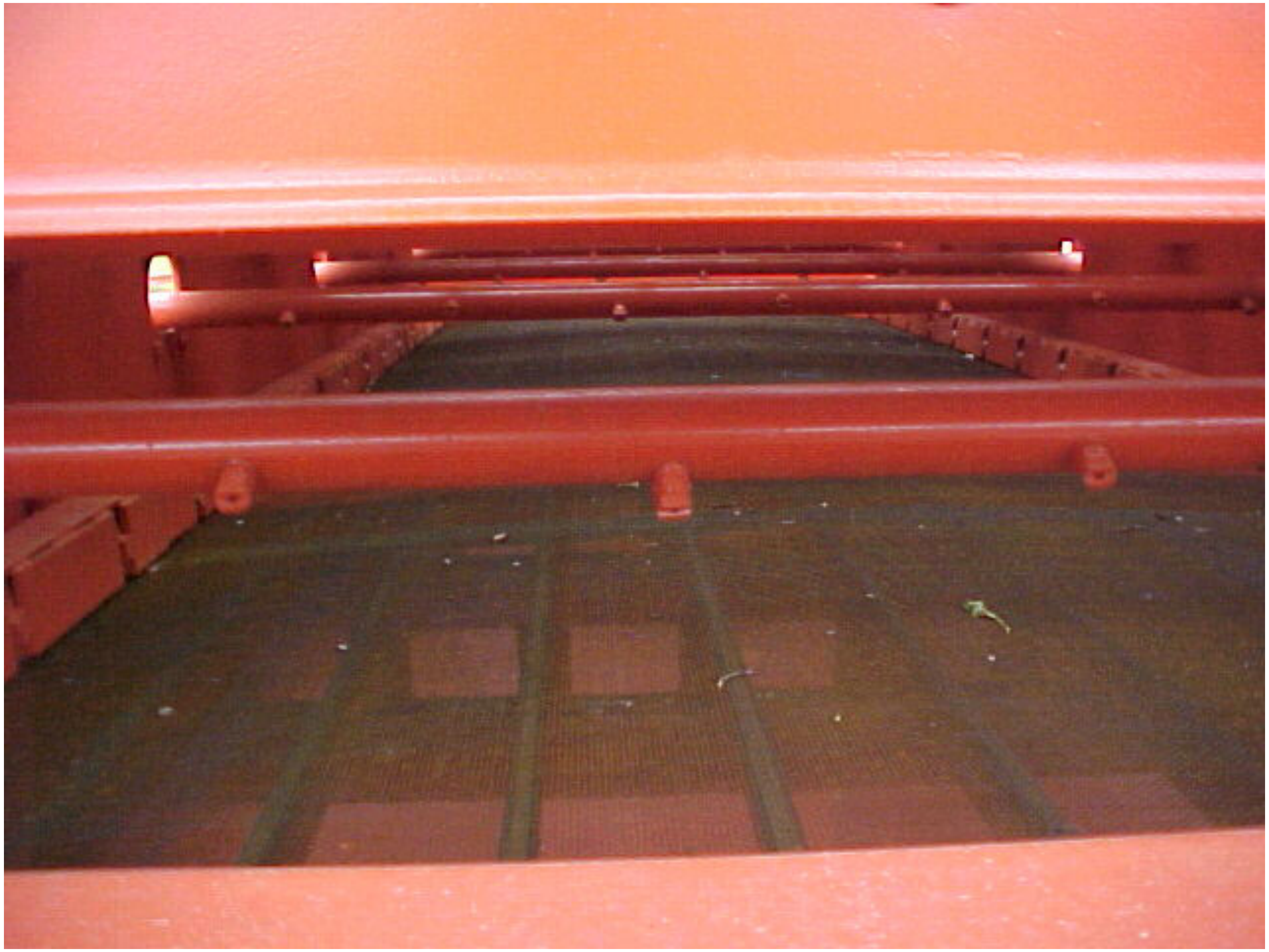
Gravel Separation 2nd Mobilization & Installation

FUSRAP Maywood Superfund Site
Maywood, New Jersey
Contract No. DACW41-99-D-9001
Pilot Plant Demonstration / Soils Acquisition Photos

Gravel Separation System - Top Screen Deck

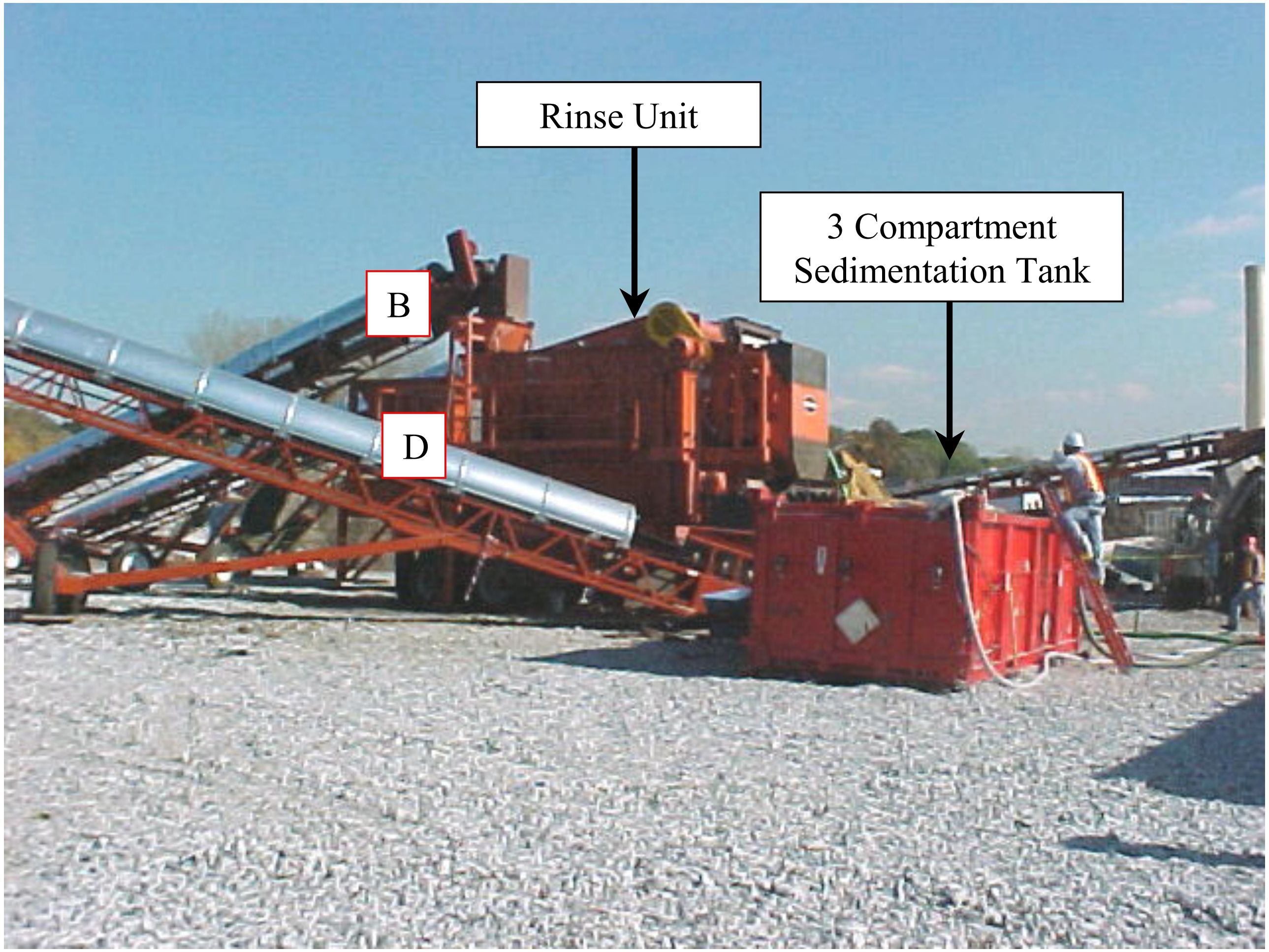
FUSRAP Maywood Superfund Site
Maywood, New Jersey
Contract No. DACW41-99-D-9001
Pilot Plant Demonstration / Soils Acquisition Photos

Rinse Unit Installation in Progress



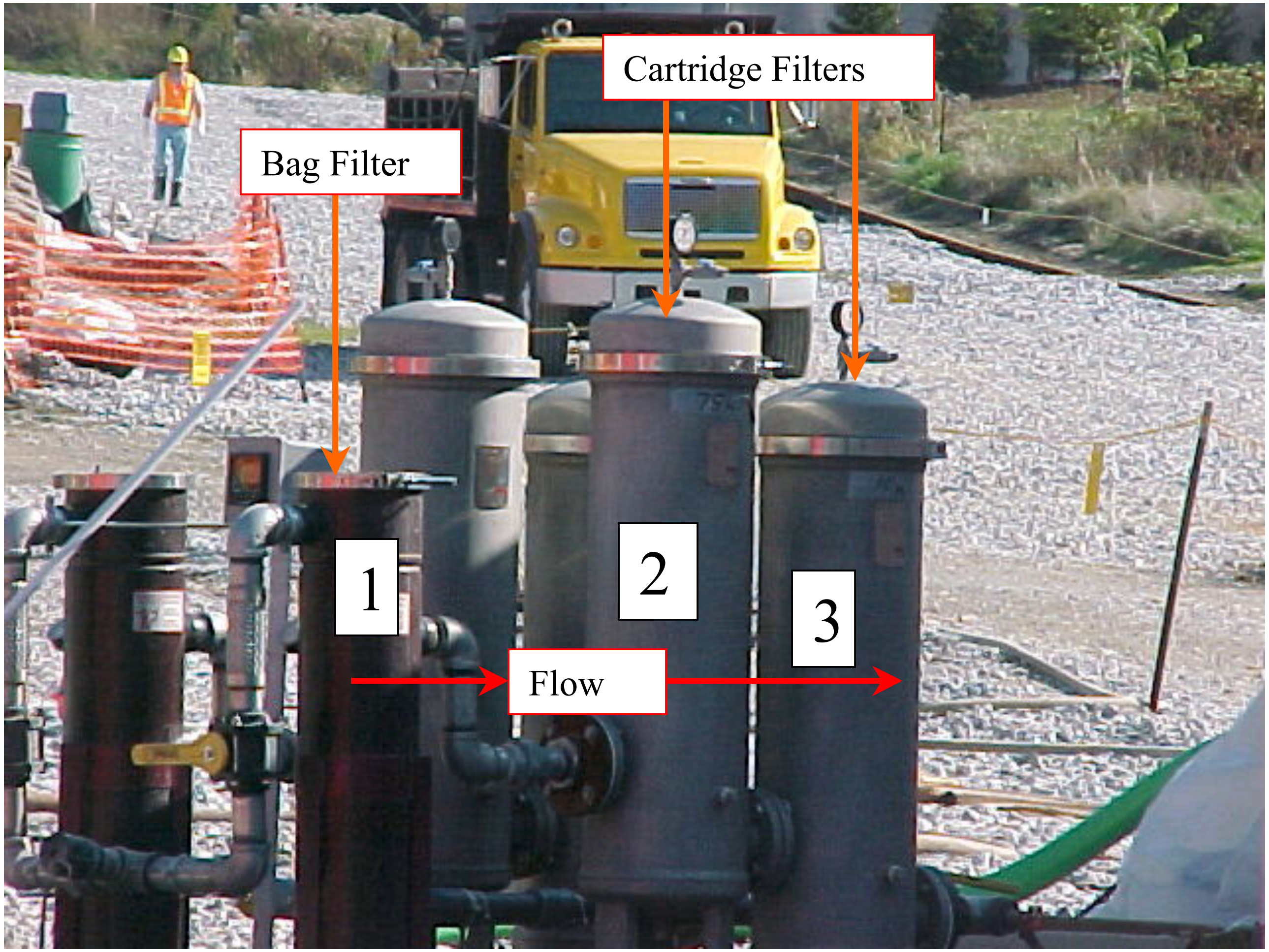
Rinse Unit Second Screen Deck With Water discharge Nozzles

FUSRAP Maywood Superfund Site
Maywood, New Jersey
Contract No. DACW41-99-D-9001
Pilot Plant Demonstration / Soils Acquisition Photos



Rinse Unit and Sedimentation Tank

FUSRAP Maywood Superfund Site
Maywood, New Jersey
Contract No. DACW41-99-D-9001
Pilot Plant Demonstration / Soils Acquisition Photos



Alternating Dual Filtration System (Each with 3 Filtration Chambers)

FUSRAP Maywood Superfund Site
Maywood, New Jersey
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Pilot Plant Demonstration / Soils Acquisition Photos

20,000 Gallon Capacity for Water Storage and Re-cycle for the Rinse Unit

FUSRAP Maywood Superfund Site
Maywood, New Jersey
Contract No. DACW41-99-D-9001
Pilot Plant Demonstration / Soils Acquisition Photos

Typical Rinse Product Stockpile

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Maywood, New Jersey
Contract No. DACW41-99-D-9001
Pilot Plant Demonstration / Soils Acquisition Photos

Rinsed Product with one pass through the Gravel Separation System utilizing Recycled Water

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Maywood, New Jersey
Contract No. DACW41-99-D-9001
Pilot Plant Demonstration / Soils Acquisition Photos

Surge Hopper to Maintain a Continuous Feed to the Radiological Sorting System

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Contract No. DACW41-99-D-9001
Pilot Plant Demonstration / Soils Acquisition Photos

Temporary Grizzly and Hopper Set-up - Direct Feed to the Radiological Sorting System

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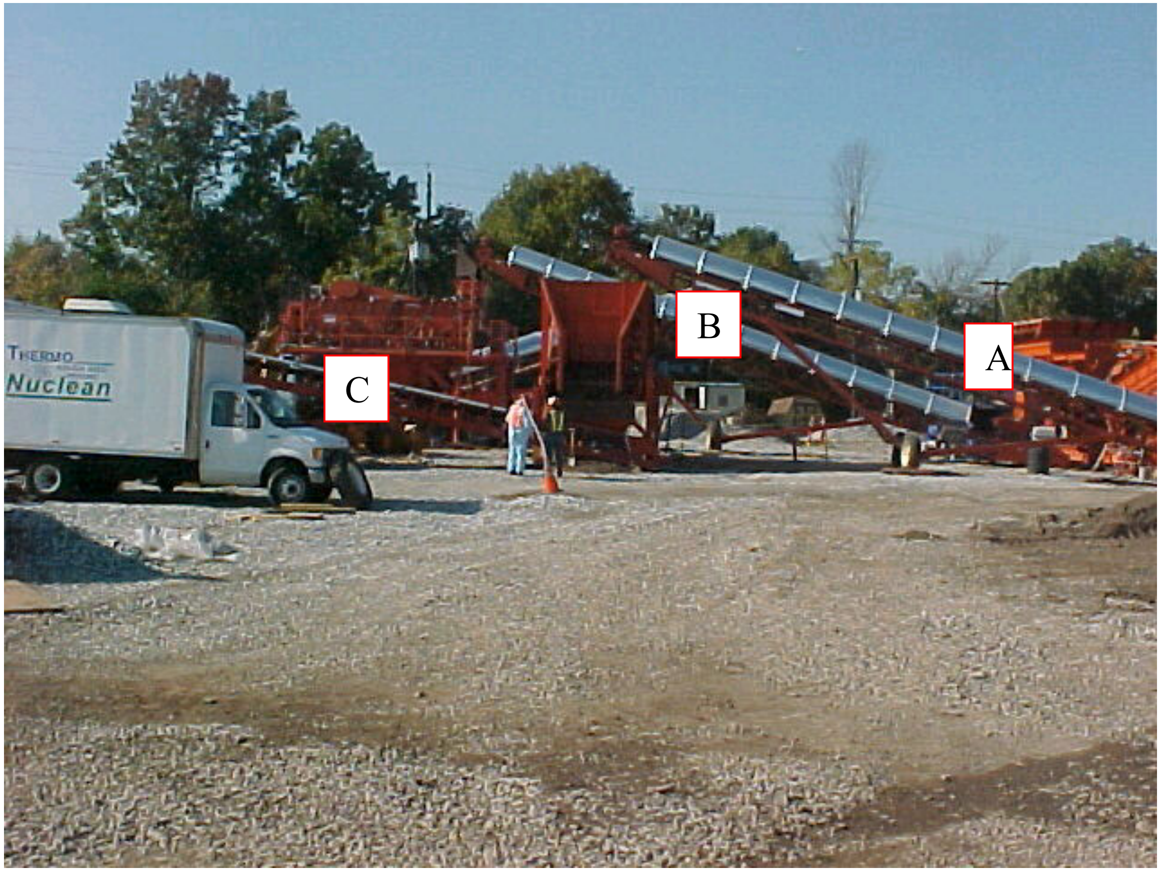
Contract No. DACW41-99-D-9001
Pilot Plant Demonstration / Soils Acquisition Photos



A: Stacker/Radial Conveyor Belt, -3/8" Product Discharge to Intermediate Hopper From Grizzly

B: Stacker/Radial Conveyor Belt, +3/8" Product Discharge to Rinse Unit From Grizzly

C: Stacker/Radial Conveyor Belt, -3/8" Product Discharge to SGS Hopper from Int. Hopper

FUSRAP Maywood Superfund Site
Maywood, New Jersey
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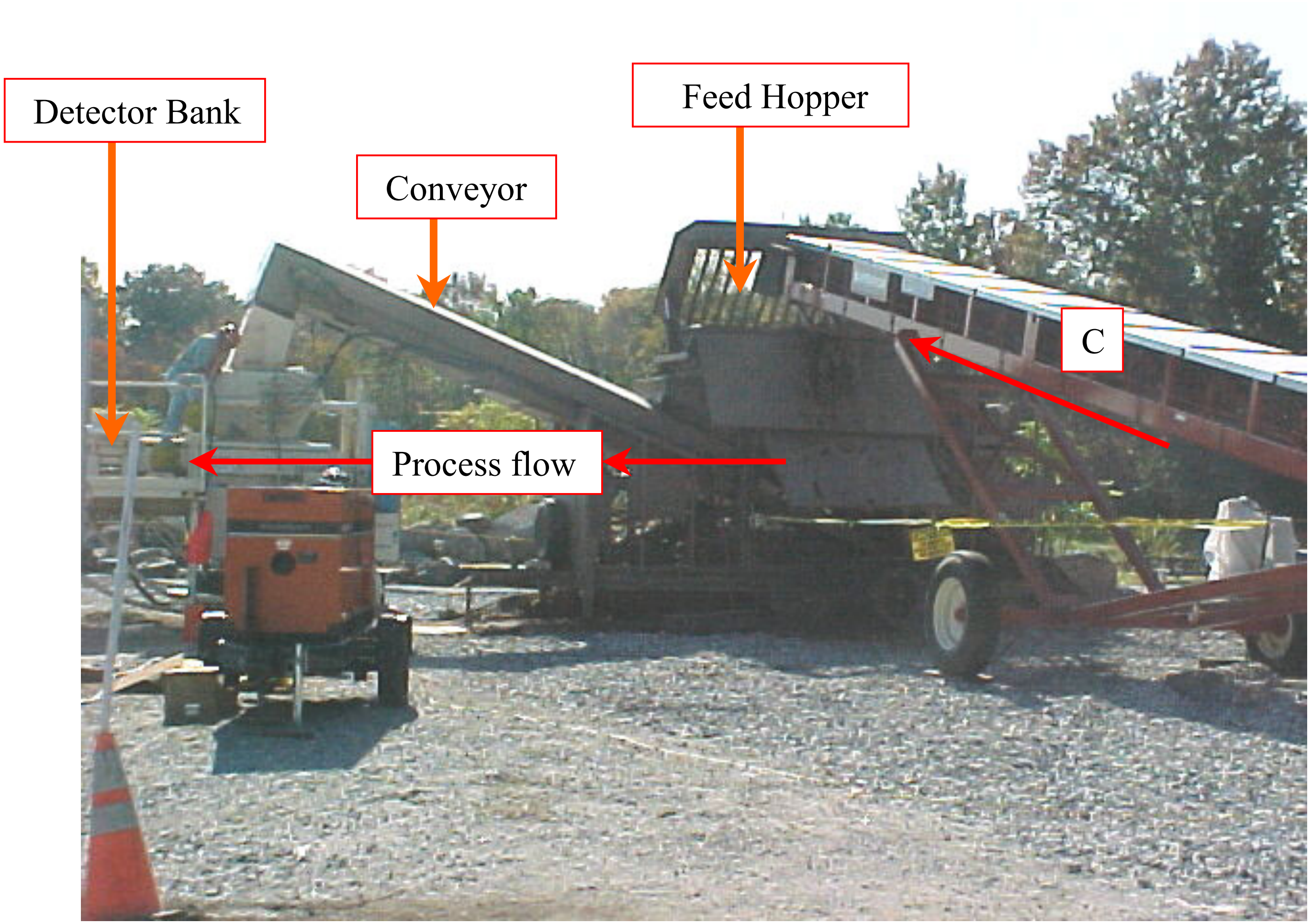
Pilot Plant Demonstration / Soils Acquisition Photos



Radiological Sorting System (Feed and Process Flow)

FUSRAP Maywood Superfund Site
Maywood, New Jersey
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The Radiological Sorting System (Operated by Thermo-Nutech)

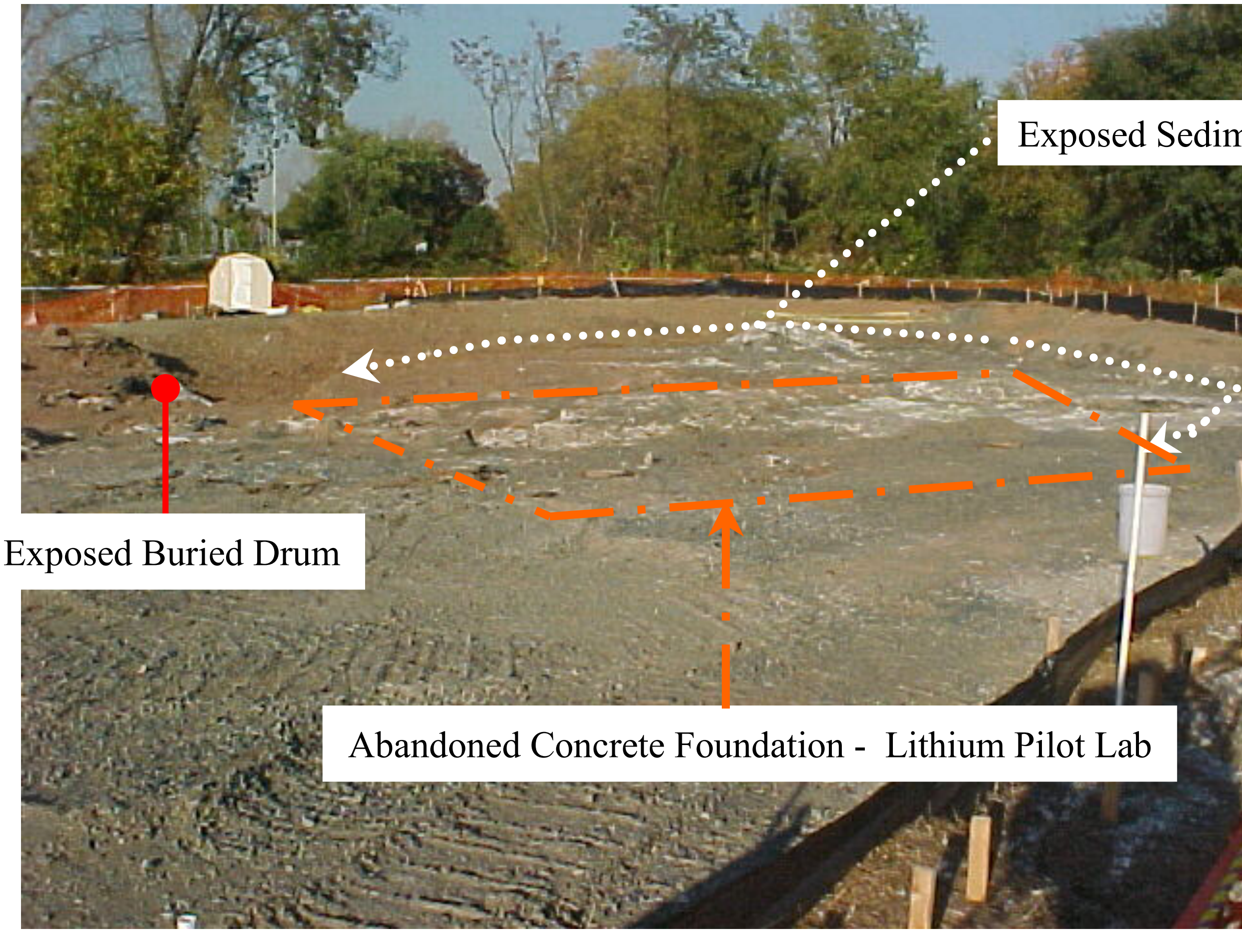
FUSRAP Maywood Superfund Site
Maywood, New Jersey
Contract No. DACW41-99-D-9001
Pilot Plant Demonstration / Soils Acquisition Photos

Limits of the Soil Acquisition Area

FUSRAP Maywood Superfund Site
Maywood, New Jersey
Contract No. DACW41-99-D-9001
Pilot Plant Demonstration / Soils Acquisition Photos

Soil Acquisition Excavation Progress

FUSRAP Maywood Superfund Site
Maywood, New Jersey
Contract No. DACW41-99-D-9001
Pilot Plant Demonstration / Soils Acquisition Photos



Soil Acquisition Area with Subsurface Obstacles

FUSRAP Maywood Superfund Site
Maywood, New Jersey
Contract No. DACW41-99-D-9001
Pilot Plant Demonstration / Soils Acquisition Photos

Final Excavation Cut at The Soil Acquisition Area Stage II

APPENDIX B
RADIOLOGICAL SORTING SYSTEM TECHNOLOGY DESCRIPTION

APPENDIX B

INTRODUCTION

This appendix discusses the technical aspects of the ThermoNUtech/Eberline Services' Radiological Sorting System (RSS) that affect the ability of the RSS to make decisions regarding the sorting of soil as the RSS was configured for the Pilot Demonstration site.

Input Parameters

The RSS computer makes soil-processing decisions based on parameters entered by the RSS operator. Soil greater than reject criteria values fall onto a conveyor to a "contaminated pile." Soil less than reject criteria values is sent through "gates" that funnel clean soil to a second conveyor, and ultimately to a clean soil pile.

Operator input parameters are normally determined based upon general site knowledge, process data gathered during system operation, regulatory decisions and customer requirements. Additionally, during the course of the Pilot Demonstration, enhancements were made to parameters based on evaluations performed by Eberline Services' scientists and engineers. The ability of the system to make correct decisions regarding rejecting contaminated soil depends heavily on optimization of the input parameters for the specific site's needs.

Detectors

NaI detectors were used for detection of radiation by the RSS. NaI detectors have relatively high gamma detection efficiency and require little maintenance. NaI detectors are often used for isotopic identification of simple spectra. The RSS as used at Maywood allowed for setting energy windows and for performing gross analysis rather than using spectroscopic techniques. The RSS was set up at Maywood to distinguish between counts from U-238 and the sum of the counts from Ra-226 and Th-232. Knowledge of the site radionuclides appropriate calibrations (found at the end of this appendix) and parameter settings are crucial to effective use of gross counting techniques.

Thinner detectors were used for U-238 detection in order to maintain good efficiencies for low energy gamma rays while reducing the amount of interference from high-energy gamma rays. Thicker detectors are used for detection of the higher energy gamma rays of Ra-226 and Th-232. Table 1 gives array specific information.

Table B-1
NaI Detector Arrays

	Array 1 (Thick)	Array 2 (Thin)
Detector Dimensions	2" x 4" x 4"	0.16" x 4" x 4"
Number of Detectors in Array	8	8
Nuclide(s) of Interest	Th-232 and Ra-226	U-238
Energy Window Setting	480keV – 750keV	40keV – 110keV

BACKGROUND

Ambient Background

The radionuclides of interest in the remediation at Maywood (U-238, Th-232 and Ra-226) are also found in the natural environment, as are other natural background radionuclides that have gamma rays contributing to counts in the energy windows as set up on the RSS. These background levels must be subtracted from sample counts in order to determine the levels of these radionuclides in contamination at the Maywood sites.

Background counts are used to determine the net radionuclide activity and segment and RSS batch reject criteria values[1]. Ambient background data is also used to calculate RSS LLDs reported for RSS at the Maywood site.

A soil sample representative of the regional natural background was counted by the RSS to determine the ambient background radiation for each detector in the appropriate energy window for that detector as used at Maywood. This detector background was saved, and the background counts were reconstructed and subtracted from each sample count. The average clean-soil background values are given below.

Sample soil from the backfill at an offsite location was chosen to characterize background for the Pilot Demonstration. Fractions of a single grab sample were taken from this single sample and were analyzed. This is not a statistically significant sampling of the region to determine background levels with confidence, however, the levels are sufficiently low, indicating that the choice of offsite soil is representative of regional background. Error bars have not been established for the RSS background. Table 2 shows the grab sample and RSS background results.

Table B-2
Background Levels of Radionuclides at Maywood

Radionuclide	Grab Sample Activity[2] (pCi/g)	RSS Background Activity[3] (pCi/g)
U-238	0.98 (MDA)	1.13
Th-232	0.16 +- 0.27	0.08
Ra-226	0.32+-0.14	N/A[4]

Since ambient background is expected to be stable, this method is valid for subtraction of ambient background providing that the background sample chosen is indeed representative of the regional background. Representative uncontaminated soil sample backgrounds for the Maywood site have not yet been established.

[1] Per telephone conversations March, 2001, Joe Kimbrell, Eberline Services, with Barbara Reider, CHP, and Paul Taylor of SWEC.
[2] Two fractions of a single grab sample were analyzed at the on-site laboratory. The results at this time are unqualified. This data is not statistically significant, however, the values appear to be in the range expected for natural levels of these radionuclides. The highest value detected is given if detected above background. MDA is supplied where activity was not detected above the instrument critical level.
[3] Based on Batch and Segment data from Attachment1.
[4] The RSS was not calibrated for Radium-226 at the Maywood site. All material in the Th-232/Ra-226 energy window was assumed to be Th-232 for the Pilot Demonstration.

Compton Scatter and Crossover Background

The number of counts observed in a low energy window may also be elevated by Compton scatter and crossover counts due to above natural background activities of higher gamma ray emitters. Elevated background levels of Th-232 and Ra-226 add to the counts in the U-238 (low energy) window at Maywood. Gamma spectroscopy and other laboratory analysis results (Appendix E) indicate that Th-232 is more abundant than Ra-226. The RSS analysis is set based on the assumption that all of the activity in the higher energy window was Th-232.

ThermoNUtech's NORM software subtracts a corrected activity (based on the net counts in the higher energy window) from the counts in the lower energy window to account for this Compton and crossover effect.

The NORM correction factors used during the Pilot Demonstration were initially based on the ratio of the Th-232 efficiencies averaged for all detectors in the two energy windows, but were changed during the course of the tests due to the inaccuracy of the average crossover values for individual detector data[5]. Older NORM methods were used prior to October 17, 2000. Changes implemented new NORM software that adjusted the U-238 activity based upon the relative Th-232 efficiencies in the two energy-windows in-line with the same segments. The software version used is at the end of this appendix. RSS_k8b incorporates the latest changes and was implemented starting October 17, 2000.

CRITICAL LEVELS AND LOWER LIMITS OF DETECTION

The Critical Level (CL) was the decision level above which the instrument assumes counts were positive (i.e., from a sample) and below which the instrument assumes only background radioactivity is present.

The critical level for the RSS is calculated based upon clean soil background data, and used a one-percent false positive error. The critical level was factored into the Adjusted Alarm levels used to determine reject criteria values for the RSS (see below, Soil Rejection Logic). The critical level and the Adjusted Alarm levels should also incorporate the crossover background (NORM), and it was assumed that this had been incorporated into the RSS software by ThermoNutech.

Lower Limit of Detection (LLD) was a system performance benchmark that gives the smallest activity that can be reported by an instrument in the presence of background, under defined operating conditions and with an acceptable false positive (alpha) and false negative (beta) errors.

Data was collected for an 1800 second count of clean soil, and the count per second (cps) calculated for both batch and segment scenarios. CLs and LLDs in units of counts are then calculated based upon the actual count times for segments or RSS batches. These generic LLD values may then be adjusted for the efficiency, density and volume of the segment in order to obtain the LLD for a particular SLUG or batch of soil counted by the RSS[6]. LLDs for Ra-226 are not available because the Th-232/Ra-226 energy window was not calibrated for Ra-226.

[5] Reference 10 and Telephone Conversation, 3/22/01, Joe Kimbrel, Eberline Services, and B. Reider, SWEC
[6] Phone conversation 3/26/01, B. Reider, SWInc., with Joe Kimbrell, Eberline Services, and Appendix 1.

Table B-3
CLs and LLDs for the Maywood RSS

Radionuclide	Sample Type	CL (1% alpha)[7] (counts)	LLD[8,9] (1% alpha, 5%beta) (counts)	LLD[9] (1% alpha, 5%beta) (pCi/g)	LLD[8,9] (5%alpha, 5%beta) (c)	LLD[8,9] (5% alpha, 5%beta) (pCi/g)
U-238	Batch	2708	3307c	**21.2**	3059	**19.6**
	Segment	35	47c	**28.3**	43	**25.9**
Th-232	Batch	1480	1829c	**1.6**	1686	**1.5**
	Segment	21	31c	**2.8**	27	**2.4**

Note that LLDs previously reported were 30pCi/g for U-238, 3 pCi/g for Th-232, and 4 pCi/g for Ra-226 (ref: Draft Soil Sorting/Soil Washing Technology Evaluation Report). Conditions for calculating these LLDs were not given, and it is not known whether these are for batches or segments.

Increasing the cleanup criteria used makes it easier for the RSS to distinguish statistically between samples above and below the reject criteria values. The Pilot Demonstration test results demonstrate that, at lower cleanup criteria settings, there is no difference between the radionuclide content of the soil samples which have been rejected by the RSS as not clean and those accepted by the RSS as clean. Test results also demonstrate that there was a significant difference between the two stockpiles when higher cleanup criteria were used. Section 5 discusses the test results in more detail.

SOIL REJECTION LOGIC

The RSS logic reviews data from individual 4 inch by 12-inch sample segments and for discrete RSS batches of 80 segments. The RSS logic contains rejection criteria[10] for both the low energy window (U-238) and the higher energy window (Th-232/Ra-226).

The system is capable of using single hot particle logic, multiple hot particle logic, and distributed source logic. The RSS parameters must be set up in order to optimize the system for the type of source, mixture of radionuclides, background radiation, and the cleanup criteria desired at each particular site. The Maywood site is expected to have distributed sources rather than hot particles, therefore the hot particle rejection parameters were not used at the Maywood site.

The cleanup criteria values set on the RSS during the Pilot Demonstration were changed during the course of the Project. Initially, criteria of 15pCi/g were used for Ra-226 and Th-232, and 50pCi/g for U-238. Cleanup criteria settings versus data are discussed section 5.4.

---

[7] The alpha of 1% is approximate.
[8] Alpha and beta error values given are approximate; in all cases statistics were lower than 5%, resulting in a reported LLD lower than the actual 1% or 5% value would be. The difference between the above values and those for exactly 5% errors is expected to be on the order of 20% or less.

[9] Background sample values for density and efficiency are used per Attachment 1. The background density used is 1.2g/cc, Th-232 efficiency is 0.0870 c/Bq, U-238 efficiency is 0.0111 c/Bq.
[10] Rejection criterion value is used to mean a value that, if exceeded, would cause the soil on the RSS to be separated out and placed in the contaminated soil pile by the system.

Software enhancements for refining the net count results due to naturally occurring radiological material (NORM) in the low energy window were used during the Pilot Demonstration. These were not fully operational until October 17, 2000. Prior to that date, the low energy window reject parameters were set so that no samples would be rejected for U-238; therefore, prior to October 17, 2000 elevated levels of U-238 would not trigger the system to reject samples.

Individual Segment Logic

Individual segments were sent to the "Above Criterion" or contaminated pile if the individual segment is above a reject criterion value. The rejection criterion value is equal to a factor multiplied by an Adjusted Alarm level. The multiplication factor is a input parameter to the RSS. The Adjusted Alarm level is based upon the mass of material in an individual segment, the cleanup criterion input, the standard deviation of the background counts and the standard deviation of the counts equivalent to the adjusted setpoint. The multiplication factor was set at "2" during the Pilot Demonstration. Segments with counts below the reject criterion value are reviewed according to RSS batch logic.

Batch Logic

Each group of 80 segments was an RSS batch, per RSS logic. The 80 segment RSS batch size is a fixed value, determined by the length and width of the conveyor bed. Ten sets of eight segments passed under the detectors before a set of 8 segments reaches the RSS gates; therefore, the RSS can accumulate 80 segments of data prior to making a decision about the RSS batch.

The RSS batch logic used an averaging technique to establish an Adjusted Alarm that was based upon the mass of material remaining after rejecting individual segments, the cleanup criterion input, the standard deviation of the background counts and the standard deviation of the counts equivalent to the adjusted setpoint.

If the counts summed from those segments not rejected using the individual segment logic were less than the Adjusted Alarm level for the RSS batch, the entire group of segments was assumed to be clean and were not rejected.

If the counts summed from those segments not rejected using the individual segment logic are greater than the Adjusted alarm level for the RSS batch, the RSS begins rejecting the segments in order until the remaining segments are below the Adjusted Alarm level for the RSS batch. If 41 of the segments of a RSS batch were rejected, the entire RSS batch is rejected.

The reason for using RSS batch logic with cleanup criteria was that larger samples provided better statistics, resulting in more reliable data and better system sensitivity. The largest amount of sample which was averaged by the RSS for the Pilot Demonstration was approximately 128kg.

DATA

Calibration

System calibration documentation is supplied in reference 2. The system was calibrated using appropriate sources for the method of analysis, gamma energies of interest and the source geometries. Calibration operations for the Pilot Demonstration included the following:

- HV Settings

- Energy/Energy Window
- Empty Belt Background
- Belt Speed
- Efficiency – Static, for U-238 and Th-232
- NORM Crossover, for Th-232 in the U-238 energy window

QC Program

Daily Quality Control (QC) checks were performed routinely during operation of the RSS, in the morning prior to operation and after shutdown, generally in the late afternoon. The QC checks included instrument and background checks, and data was recorded onto control charts. These were used to trend RSS operation, as well as to indicate whether the RSS had become significantly contaminated. The QC tests were not used to indicate the variability of low-level samples under operating conditions.

AMBIENT TEMPERATURE EFFECTS

The spectra of NaI detectors may shift if the temperature changes rapidly. This may have the effect of changing the effective efficiency within the energy windows. The magnitude of temperature shifts changes by season, with summer having the most drastic shifts.

The RSS detector boxes are environmentally controlled to maintain a temperature at 70 degrees F +- 15 degrees F.

It is recommended that, if the RSS is used in the future at Maywood, the QC source control tests be run again at approximately noon to determine whether temperature related efficiency effects are significant for the RSS for temperature changes likely in NJ.

REFERENCES

1. TR20_Abeta-Batch.doc, sent via email 3/26/01, by Joe Kimbrell, Eberline Services, to Barbara Reider, SWEC.

2. SGS_Abeta-Batch.doc, sent via email 3/26/01, by Joe Kimbrell, Eberline Services, to Barbara Reider, SWEC.

3. Eberline Services SGS Calibration Procedure, FUSRAP, Maywood Superfund Site, August 2000.

4. Segmented Gage System Sensitivity for U Detection and Sorting, Potential Long Island, NY Soils, White Paper, October 5, 2000, Joe Kimbrell & Ed Bramlitt, ThermoRetec Nuclear Services Group.

5. Summary Report, Segmented Gate System Summary of Lessons Learned From Application at Seven DOE Sites, February 2001, Sandia National Laboratory, US Department of Energy.

6. Cost and Performance Report ThermoNutech's Segmented Gate System, Sandia National Laboratories Environmental Restoration Site 16, Albuquerque, New Mexico, January 1999, Sandia National Laboratory, US Department of Energy.

7. Cost and Performance Report ThermoNutech's Segmented Gate System Pantex Plant, Firing Site 5, Amarillo, Texas, March 1999, Sandia National Laboratory, US Department of Energy.

8. Cost and Performance Report ThermoNutech's Segmented Gate System, Los Alamos National Laboratory Technical Area 33, Los Alamos, New Mexico, November 1999, Sandia National Laboratory, US Department of Energy.

9. Draft FUSRAP Maywood Superfund Site Soil Sorting/Soil Washing Technology Evaluation Report WBS8, Task 1, Volumes I and II, April 1999, Stone & Webster.

10. Email 3/20/01 from Joe Kimbrell, Eberline Services to B.Marquis et al at SWEC.

ATTACHMENTS

Attachment 1

Critical Levels and Lower Limits of Detection Calculated for the Segmented Gate System at the Maywood Site (References 1 and 2)

Attachment 2

Maywood Calibration Procedure, August 2000 (Reference 3)

Attachment 3

ThermoNutech Segmented Gate System Sensitivity for U Detection and Sorting (Reference 4)

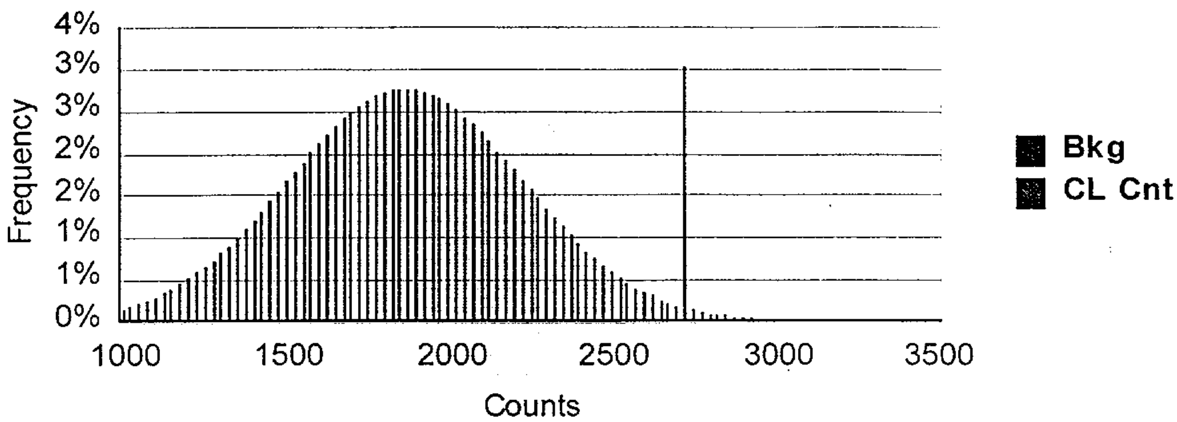
Attachment 4

DOE Evaluations of the SGS (References 5 through 8)

Attachment 5

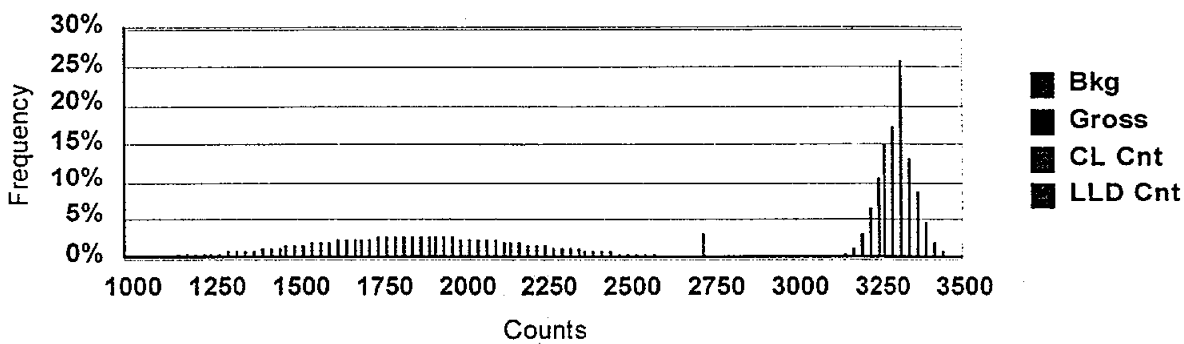
ThermoNutech SGS Soil Data Summary Spread Sheet, FMSS_Summary.xls

Gaussian Distribution for Background Counts
SGS Sorter2 at Maywood, 238U



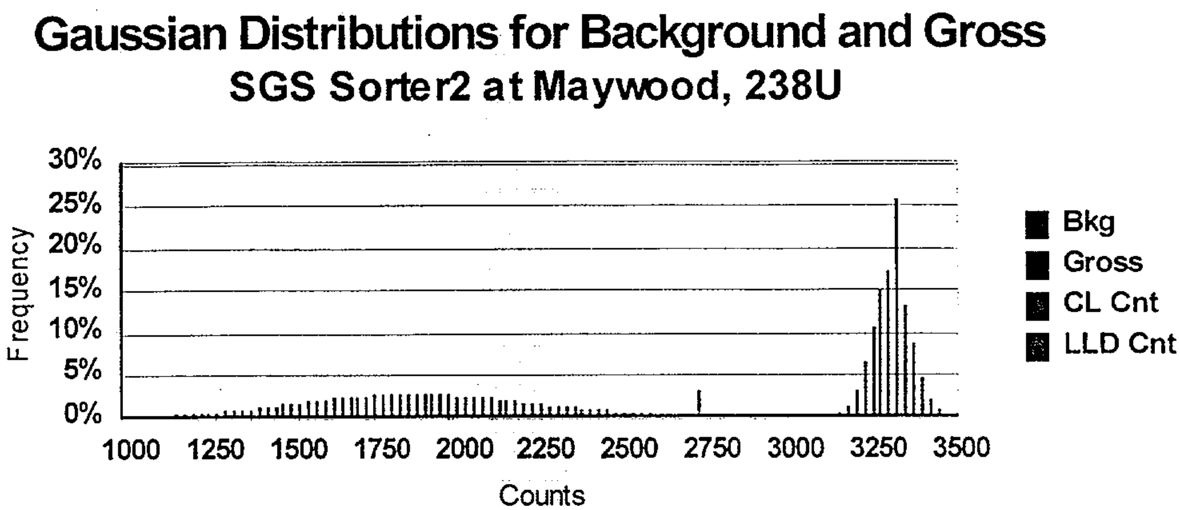
Mean background = 1,865.5 counts for a Batch
Crtitical level (CL) for false positives (alpha) <1.0% = 2,708 counts

Gaussian Distributions for Background and Gross
SGS Sorter2 at Maywood, 238U



Mean background = 1,865.5 counts for a Batch
Crtitical level (CL) for false positives (alpha) <1.0% = 2,708 counts
Lower limit of detection (LLD) for false negatives (beta) <5% = 3,307 counts

Charts from file TR20_ABeta-Batch
By Joe Kimbrell, Eberline Services 03/27/01



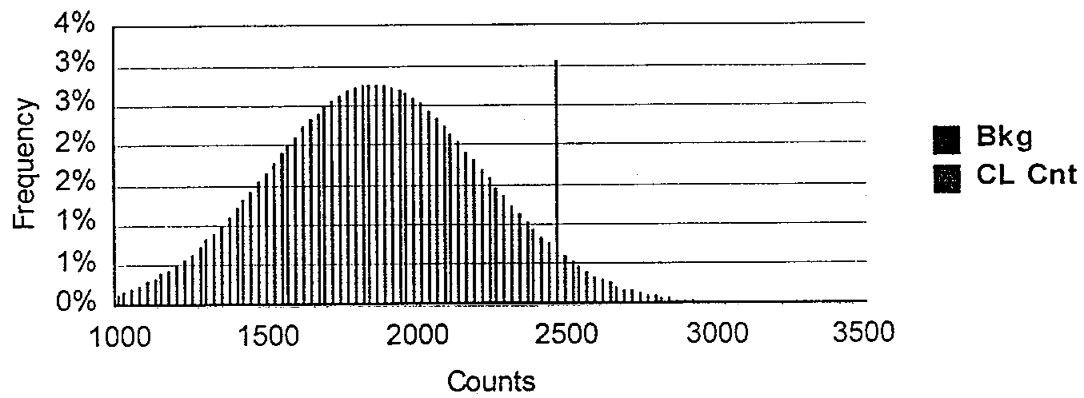
Mean background = 1,865.5 counts for a Batch

Crtitical level (CL) for false positives (alpha) <1.0% = 2,708 counts

Lower limit of detection (LLD) for false negatives (beta) <5% = 3,307 counts

Charts from file TR20_ABeta-Batch
By Joe Kimbrell, Eberline Services 03/27/01

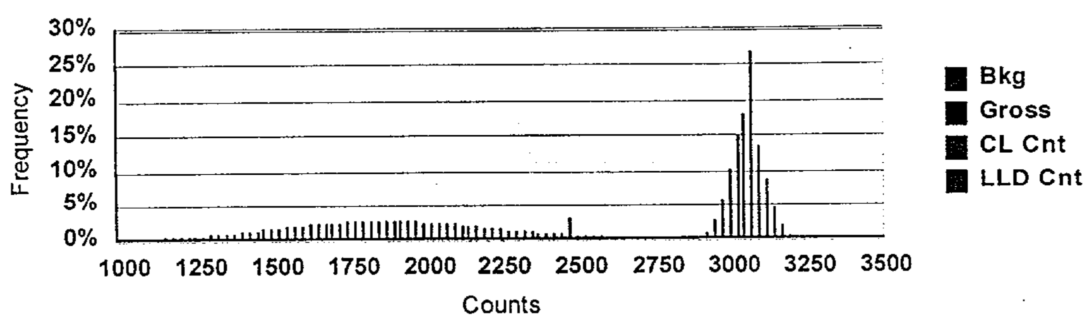
Gaussian Distribution for Background Counts
SGS Sorter2 at Maywood, 238U



Mean background = 1,865.5 counts for a Batch. MDA @ LLD for Eff=0.0111c/Bq, Mass of 148.3 Kg, is 19.6 pCi/g

Crtitical level (CL) for false positives (alpha) <5.0% = 2,461 counts

Gaussian Distributions for Background and Gross
SGS Sorter2 at Maywood, 238U



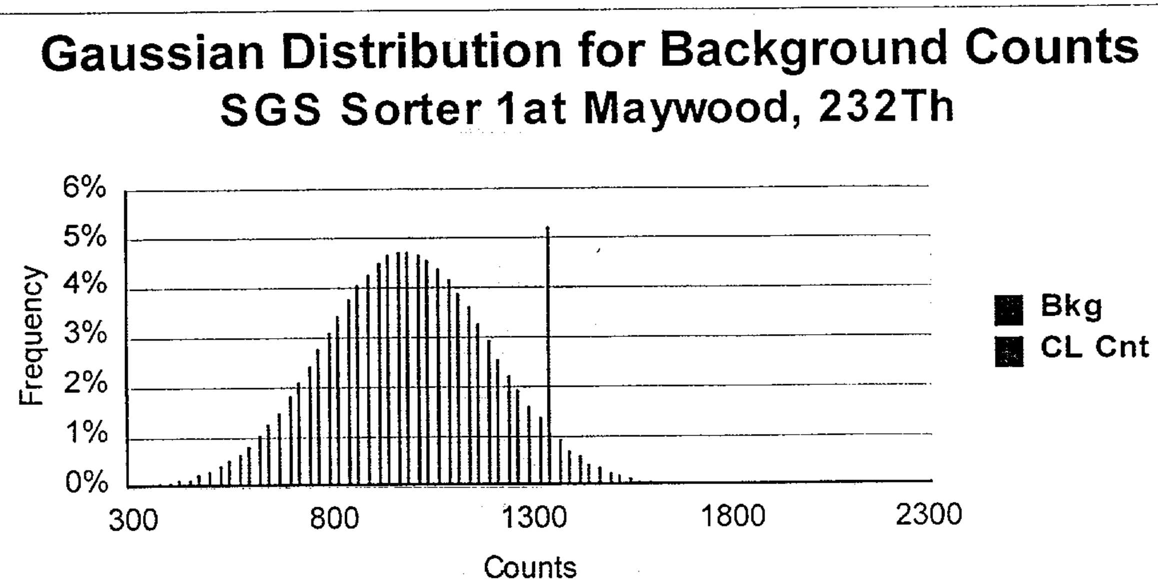
Mean background = 1,865.5 counts for a Batch. MDA @ LLD for Eff=0.0111c/Bq, Mass of 148.3 Kg, is 19.6 pCi/g

Crtitical level (CL) for false positives (alpha) <5.0% = 2,461 counts

Lower limit of detection (LLD) for false negatives (beta) <5% = 3,059 counts

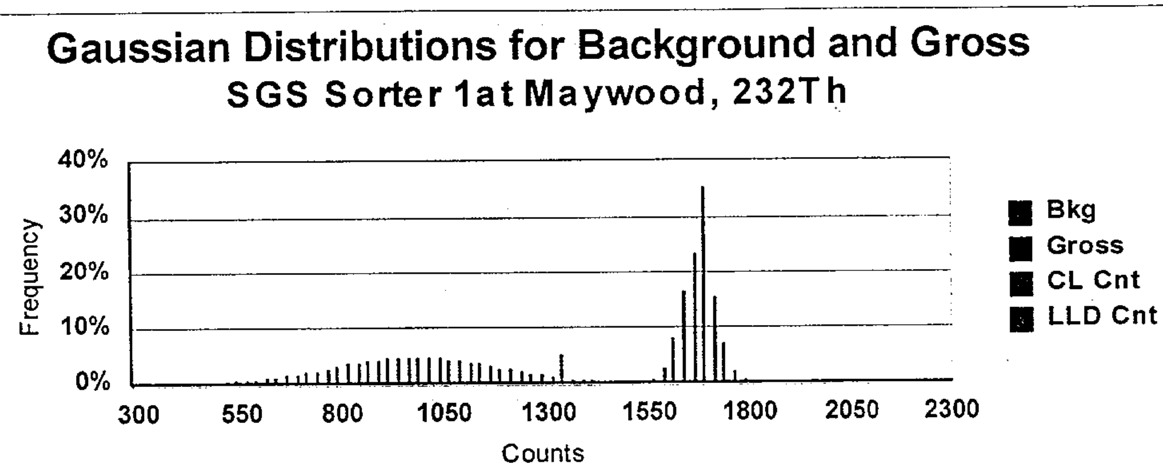
At density of 1.2 g/cc and U efficiency of 0.0111 c/Bq, the MDA at LLD is 19.6 pCi/g.

Charts from file TR20_ABeta-Batch
By Joe Kimbrell, Eberline Services 03/27/01



Mean background = 992.6 counts for a Batch. MDA @ LLD for Eff=0.0870c/Bq, Mass of 148.3 Kg, is 1.5 pCi/g

Crtitical level (CL) for false positives (alpha) <5.0% = 1,338 counts

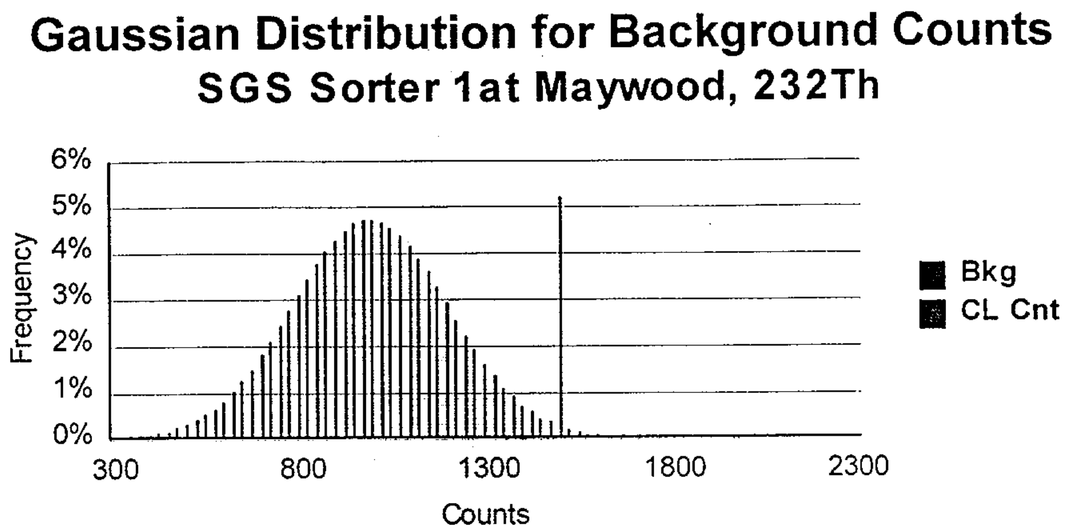


Mean background = 992.6 counts for a Batch. MDA @ LLD for Eff=0.0870c/Bq, Mass of 148.3 Kg, is 1.5 pCi/g

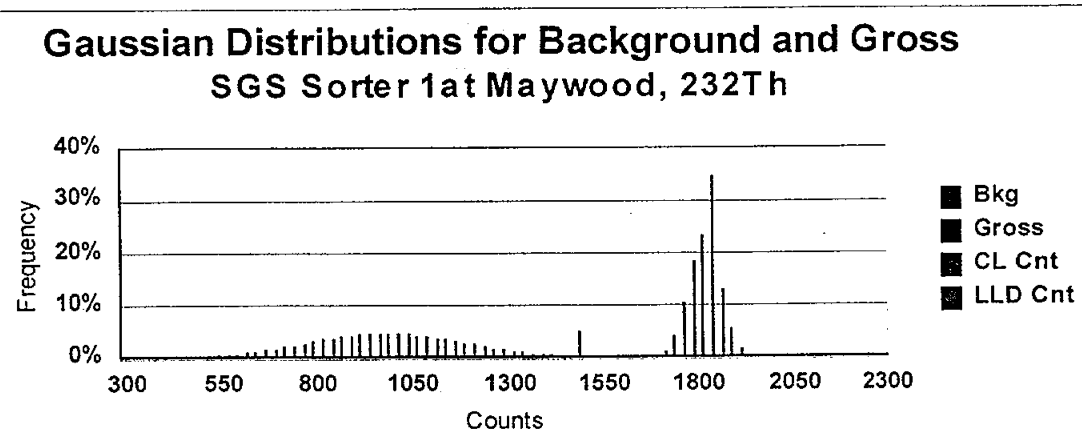
Crtitical level (CL) for false positives (alpha) <5.0% = 1,338 counts

Lower limit of detection (LLD) for false negatives (beta) <5% = 1,686 counts

Charts from file TR20_ABeta-Batch
By Joe Kimbrell, Eberline Services 03/27/01



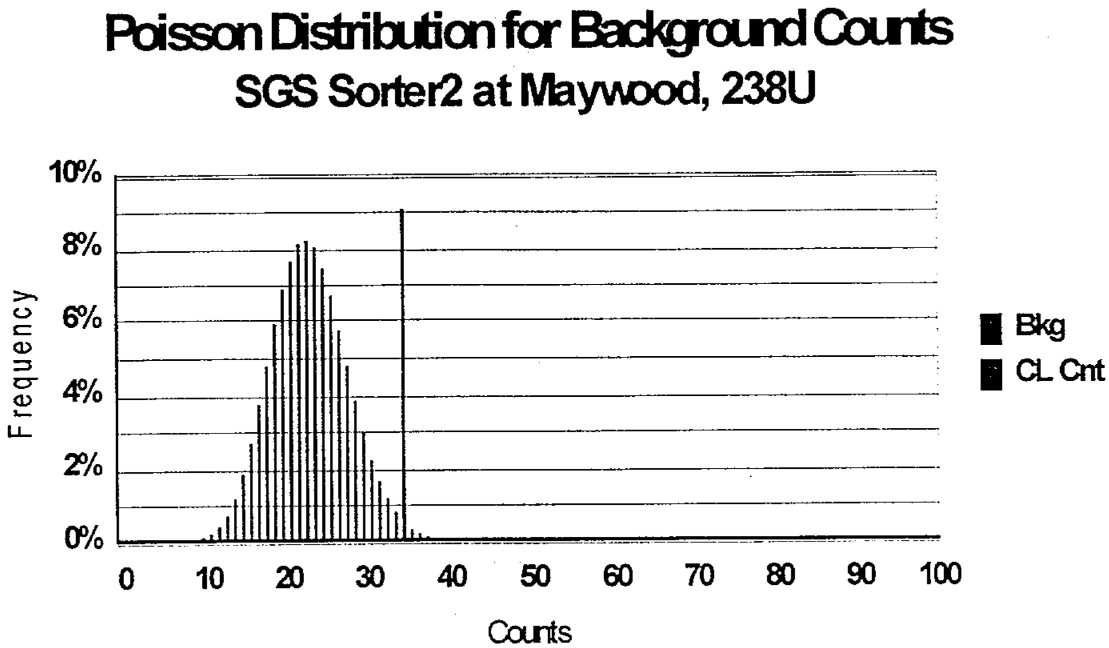
Mean background = 992.6 counts for a Batch. MDA @ LLD for Eff=0.0870c/Bq, Mass of 148.3 Kg, is 1.8 pCi/g
Crtitical level (CL) for false positives (alpha) <1.0% = 1,480 counts



Mean background = 992.6 counts for a Batch. MDA @ LLD for Eff=0.0870c/Bq, Mass of 148.3 Kg, is 1.8 pCi/g
Crtitical level (CL) for false positives (alpha) <1.0% = 1,480 counts
Lower limit of detection (LLD) for false negatives (beta) <5% = 1,829 counts

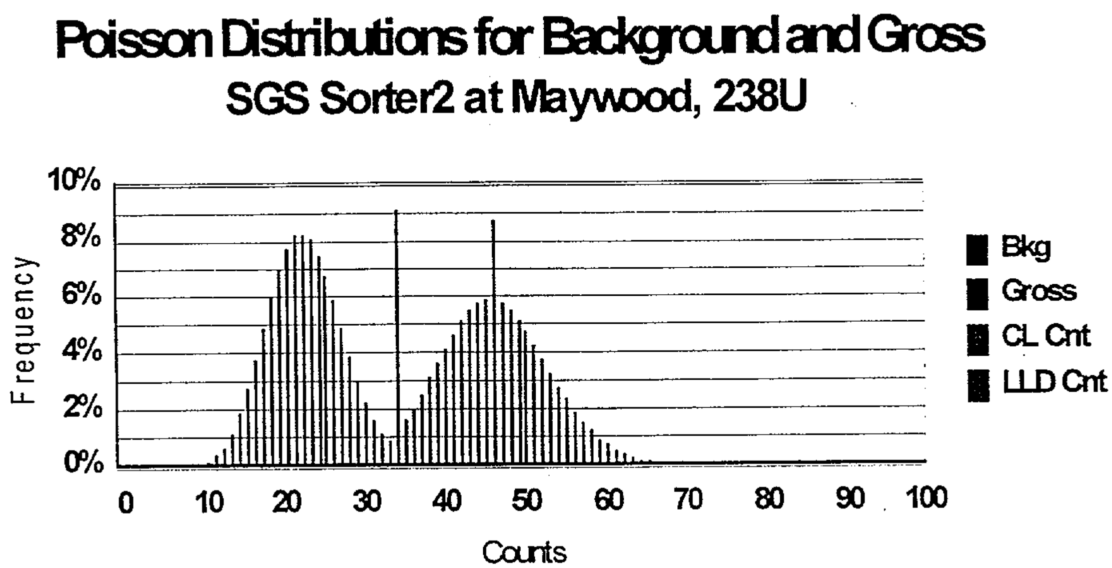
The SGS currently doesn't allow individual selection of Alpha and Beta, but the software could be changed if a client desires varied levels.

Charts from file TR20_ABeta-Batch
By Joe Kimbrell, Eberline Services 03/27/01



Mean background = 23.3 counts

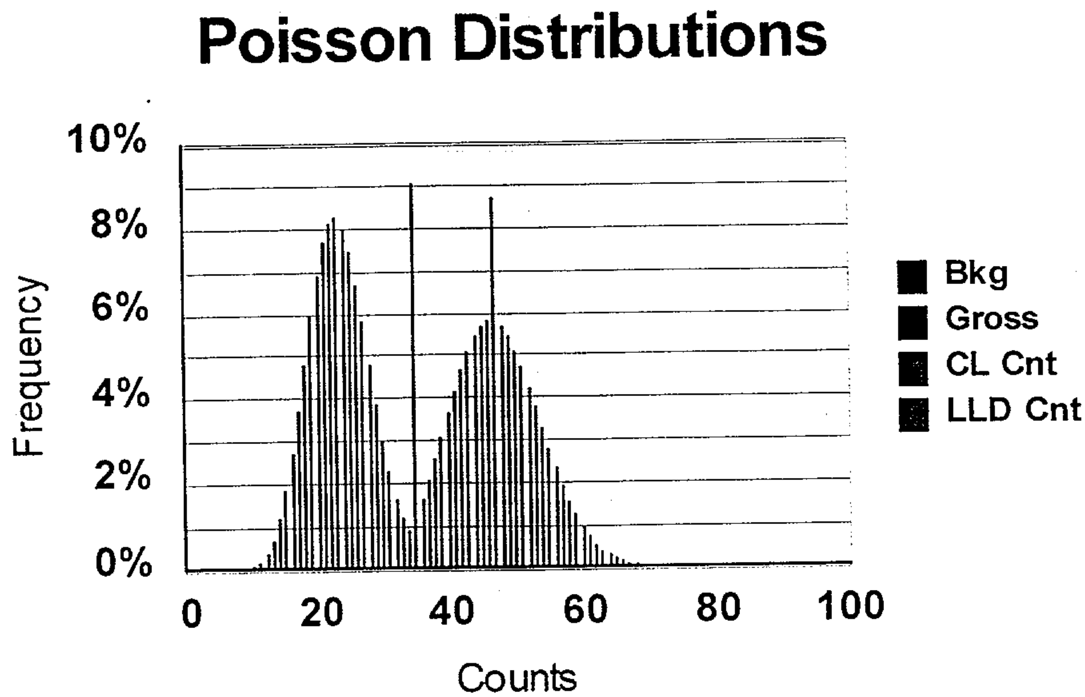
Crtitical level (CL) for false positives (alpha) <1% (precisely <0.88%) = 35 counts



Mean background = 23.3 counts

Crtitical level (CL) for false positives (alpha) <0.88% = 35 counts

Lower limit of detection (LLD) for false negatives (beta) <4.20% = 47 counts

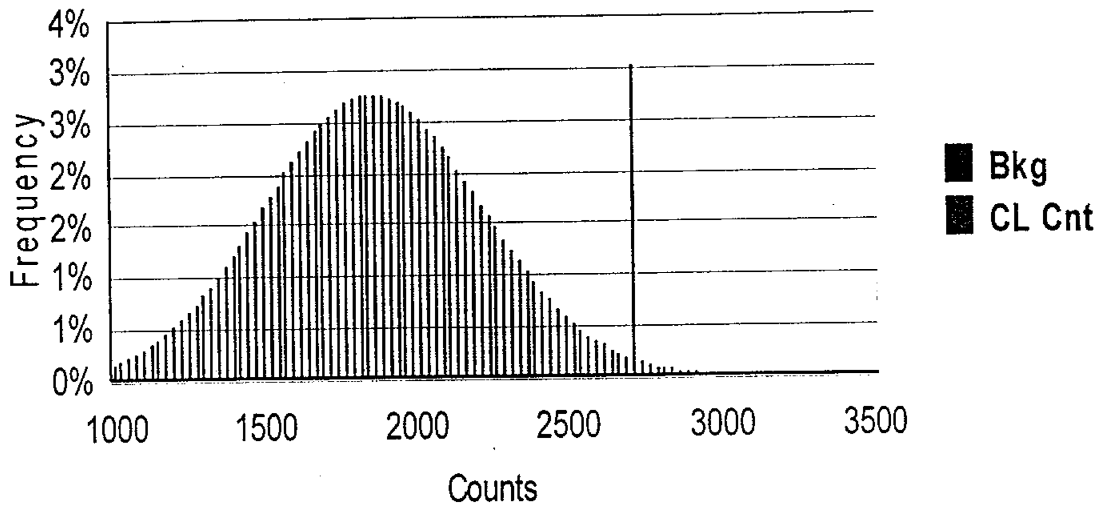


Mean background = 23.3 counts

Crtitical level (CL) for false positives (alpha) <0.88% = 35 counts

Lower limit of detection (LLD) for false negatives (beta) <4.20% = 47 counts

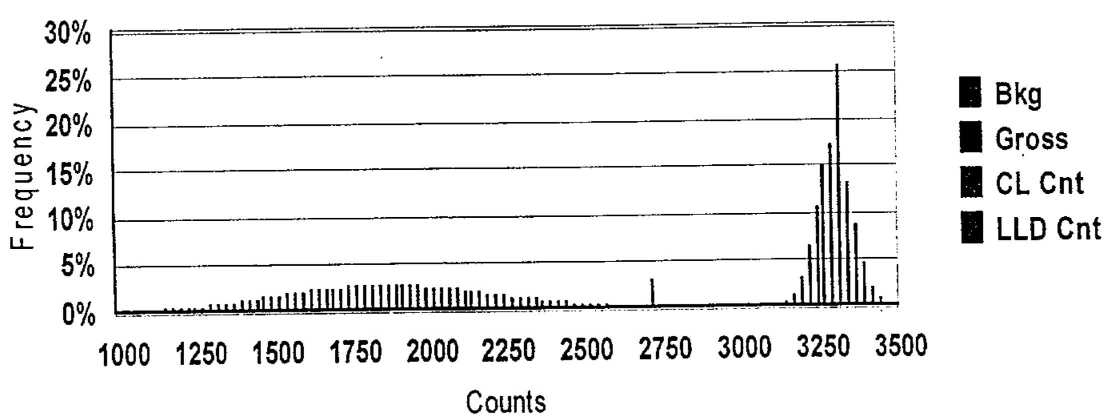
Gaussian Distribution for Background Counts
SGS Sorter2 at Maywood, 238U



Mean background = 1,865.5 counts

Critical level (CL) for false positives (alpha) <1.0% = 2,708 counts

Gaussian Distributions for Background and Gross
SGS Sorter2 at Maywood, 238U

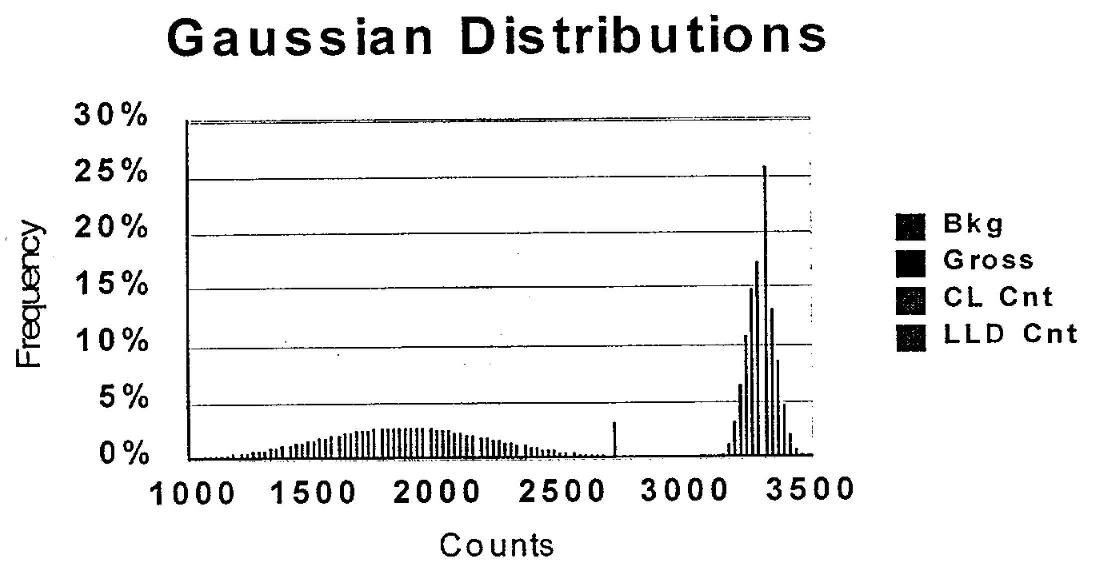


Mean background = 1,865.5 counts

Critical level (CL) for false positives (alpha) <1.0% = 2,708 counts

Lower limit of detection (LLD) for false negatives (beta) <5% = 3,307 counts

Charts from file TR20_ABeta-Batch
By Joe Kimbrell, Eberline Services 03/27/01



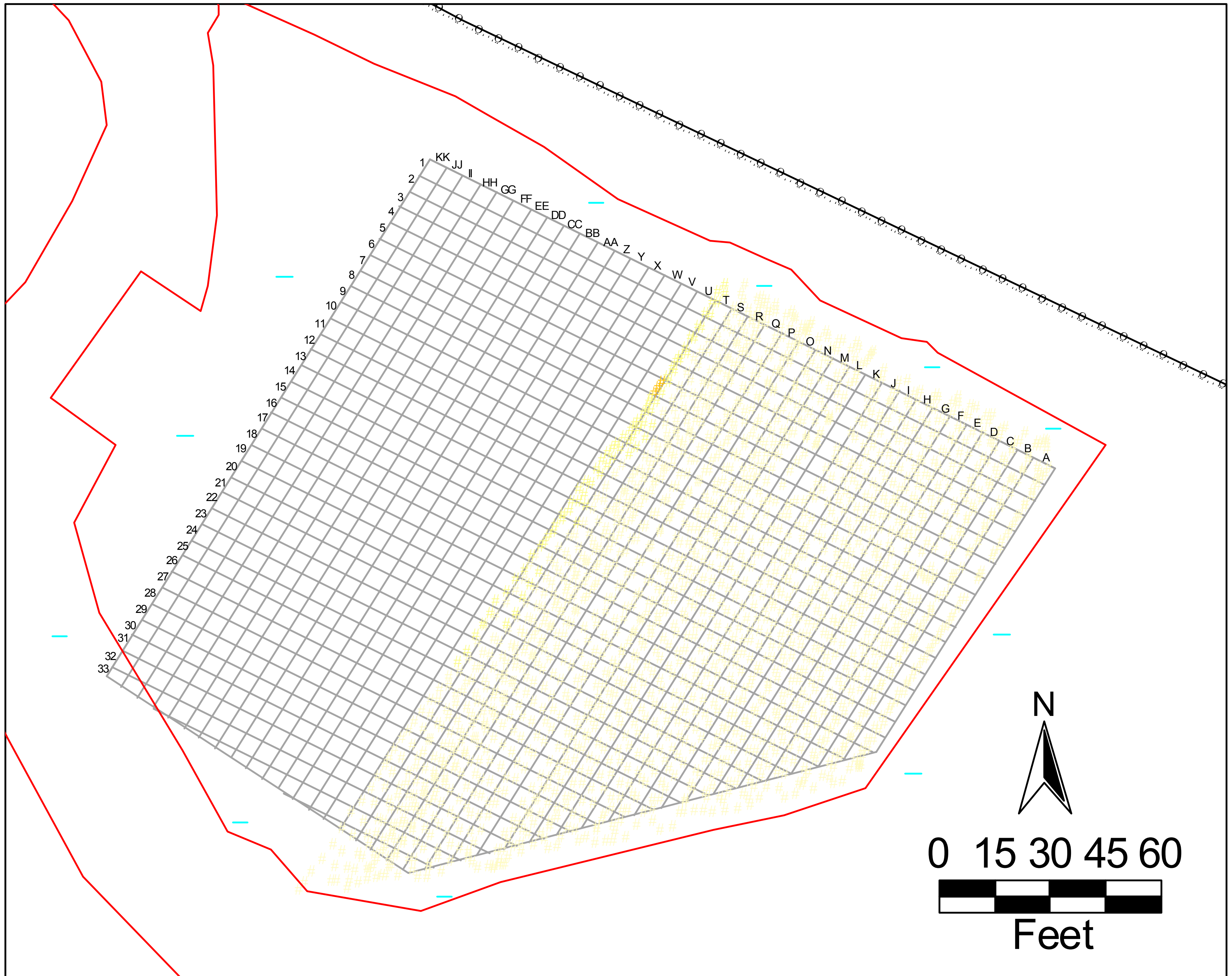
Mean background = 1,865.5 counts
Crtitical level (CL) for false positives (alpha) <1.0% = 2,708 counts
Lower limit of detection (LLD) for false negatives (beta) <5% = 3,307 counts

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
2													Corrected		Corrected									
3									Thorium/Radium, pCi/g		Uranium-238, pCi/g		Thorium/Radium, pCi/g		Uranium-238, pCi/g									
4				Reported	Total	Mass	Volume	Run	Activity	Activity	Activity	Activity	Activity	Activity	Activity	Activity				c/Bq	c/Bq			
5	Day	Date	FMSS#	Mtons	Mass (kg)	Diverted	Reduction	Time (hrs)	Diverted	Not Diverted	Diverted	Not Diverted	Diverted	Not Diverted	Diverted	Not Diverted	Th-GLA	U-GLA	Density	S1-Eff	S2-Eff	Software	Remarks	
81	Tuesday	10/17/00	S#7-3	16.2	16212	69.6	99.6%	0.728	82.2	1.7	53.3	9.2	1.7	10.3	9.1	-24.1	5	50	1.06	0.0778	0.0107	SGS_k8b	First use of the new NORM software with 8 Ks.	
82	Wednesday	10/18/00	S#8-4	13.0	12994	6.19	100.0%	0.583	11.5	1.6	164.0	6.8	11.5	1.7	-7.3	6.2	5	50	1.06	0.0778	0.0105	SGS_k8b	Ks= 1.89, 1.54, 1.93, 2.24, 1.23, 1.54, 1.48, 3.80.	
83	Thursday	10/19/00	S7-4		15608	11061	29.1%	0.656	5.3	4.2	4.0	6.7	5.3	4.2	3.8	6.7	5	50	1.13	0.081	0.0107	SGS_k8b		
84	Thursday	10/19/00	Bat-2		34845	14553	58.2%	1.350	10.3	7.8	9.4	0.1	10.2	7.8	7.9	0.1	5	50	1.34	0.898	0.0113	SGS_k8b	11:34 S1 alarm to 10 pCi/g; 11:43 density to 1.20, S1-Eff 0.841, S2-eff 0.0109.	
85	Friday	10/20/00	S6-3		15392	15392	0.0%	0.678	5.5	4.4	82.0	0.0	5.5	4.4	81.6	0.0	5	50	1.2	0.0841	0.0109	Non-NORM	11:20,1.06/.0778/.0105	
88	Monday	10/23/00	Seq-B#3		26385	69.3	99.7%	1.110	101.0	1.3	143.0	12.2	0.0	1.3	0.0	12.4	5	50	1.13	0.081	0.0107	SGS_k8b		
89	Tuesday	10/24/00	Bat-4		65555	17289	73.6%	2.840	24.1	2.2	-14.2	10.0	23.8	2.2	-16.4	9.9	5	50	1.17	0.0828	0.0108	SGS_k8b	Soil was processed in truck loads not to mix. Multiple densities & Eff.	
90	Wednesday	10/25/00	Bat-5		70753	6280	91.1%	2.810	32.0	1.7	-29.9	9.3	32.4	1.7	-32.3	9.3	5	50	1.2	0.0841	0.0109	SGS_k8b		
91	Thursday	10/26/00	Bat#7-5		114000	6580	94.2%	4.640	7.1	2.3	11.9	8.0	6.4	2.3	10.4	8.0	5	50	1.2	0.0841	0.0109	SGS_k8b	11:15 Density 1.13, S1- 0.0810, S2-0.0107	
92	Friday	10/27/00	Bat#7-6		101000	86068	14.8%	4.230	7.0	3.9	6.7	6.9	7.0	3.9	6.7	7.0	5	50	1.13	0.081	0.0107	SGS_k8b		
95	Monday	10/30/00			111380	111000	0.3%	4.420	22.4	4.7	-31.2	39.6	22.3	4.7	-31.4	39.6	5	50	1.2	0.0841	0.0109	SGS_k8b		
96	Tuesday	10/31/00	Bat#6-6		88962	88643	0.4%	3.330	16.2	4.6	-22.1	33.3	16.2	4.6	-22.3	33.3	5	50	1.27	0.087	0.0111	SGS_k8b		
97	Tuesday	10/31/00			5931	5783	2.5%	0.222	16.2	-1.6	-0.7	15.6	16.1	0.0	-2.0	0.0	5	50	1.27	0.087	0.0111	SGS_k8b	Reprocessing of oversized material from Franklin's Gravel Screen.	
98	Wednesday	11/01/00	B#6-6ov		12350	6101	50.6%	0.478	17.2	13.7	15.0	-22.8					16	50	1.23	0.0853	0.0112	SGS_k8b		
99	Thursday	11/02/00	B#6-7		139000	134000	3.6%	5.620	23.6	14.3	-19.2	-31.8					16	50	1.2	0.0841	0.0109	SGS_k8b	09:00 density 1.17, S1-Eff .0828, S2-eff .0108.	
100	Friday	11/03/00	B#6-7ov		12751	8829	30.8%	0.478	17.9	13.3	6.8	-21.0	17.8	13.3	5.5	-21.0	5	50	1.27	0.087	0.0111	SGS_k8b		
103	Monday	11/06/00																					Ran Software SGS-delay-1	
104	Tuesday	11/07/00	B8-5		112641	109000	3.2%	4.460	26.5	23.9	-25.1	-74.0	26.5	23.9	-25.3	-74.0	16	50	1.2	0.0841	0.0109	SGS_k8b		
105	Wednesday	11/08/00	B#8-5ov				#DIV/0!										25	50	1.2	0.0841	0.0109	SGS_k8b		
106		Totals			3.23E+06	1.57E+06	51.3%	133.619																

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
1	Electronic version of this document has many hiden comments which provide important information.												Batch Average Activity											
2													Corrected		Corrected									
3									Thorium/Radium, pCi/g		Uranium-238, pCi/g		Thorium/Radium, pCi/g		Uranium-238, pCi/g									
4				Reported	Total	Mass	Volume	Run	Activity	Activity	Activity	Activity	Activity	Activity	Activity	Activity				c/Bq	c/Bq			
5	Day	Date	FMSS#	Mtons	Mass (kg)	Diverted	Reduction	Time (hrs)	Diverted	Not Diverted	Diverted	Not Diverted	Diverted	Not Diverted	Diverted	Not Diverted	Th-GLA	U-GLA	Density	S1-Eff	S2-Eff	Software	Remarks	
6	Thursday	08/17/00			6473	80.9	98.8%	0.200	7.0	10.6	**110.0**	**19.4**					15	9999999	1.54	0.0437	0.0095	SGSV2	16.5Kg/15.5 Kg@18:45	
7	Friday	08/18/00			24997	1132	95.5%	1.020	206.0	11.5	113.0	76.2			10.7	11.1	15	9999999	1.17	0.0688	0.0147	SGSV2		
10	Monday	08/21/00			36756	77	99.8%	1.610	**106.0**	**6.8**	**551.0**	**61.9**					15	9999999	1.17	0.0688	0.0097	SGSV2	13:52 src chks, 14:26 0,88g/cc; 14:55 1.024g/cc	
11	Tuesday	08/22/00			100000	10.8	100.0%	4.500	**228.0**	**6.6**	**364.0**	**61.7**					15	9999999	1.06	0.0641	0.0105			
12	Wednesday	08/23/00			32547	41.8	99.9%	1.460	**175.0**	**6.7**	**352.0**	**77.8**					15	9999999	1.06	0.0641	0.0105	SGSc2V2	No subtraction	
13	Thursday	08/24/00			55187	29249	47.0%	2.290	5.7	5.3	**73.7**	**70.2**					15	9999999	1.2	0.0697	0.0109	SGSc2V2	MPF=3 @ 10:07, MPF=8/10/5	
14	Friday	08/25/00																					No run day	
17	Monday	08/28/00			56134	38301	31.8%	2.360	6.5	5.1	**85.5**	**71.1**					5.68	9999999	1.2	0.0697	0.0109			
18	Tuesday	08/29/00			91764	45991	49.9%	3.640	6.1	5.0	**78.5**	**69.8**					5.68	9999999	1.2	0.0697	0.0109			
19	Wednesday	08/30/00			57870	42769	26.1%	2.490	6.5	4.2	83.1	61.7	6.1	3.9	<20	<20	5.68	9999999	1.06	0.0643	0.0105		15Kg, changed to 16Kg- 1.13g/cc/0.0671/0.0107	
20	Thursday	08/31/00			6949	29	99.6%	0.267	85.9	0.1	186.0	1.8					5.68	9999999	1.24	0.0712	0.011		Soil Acquisition Area Slug test, 0818hrs to 0836hrs only.	
21	Thursday	08/31/00			42689	50.9	99.9%	1.860	104.0	1.1	238.0	19.8					5.68	9999999	1.2	0.0697	0.0109		Soil Acquisition Area Batch test, program interupted at 1250hrs.	
22	Friday	09/01/00			79583	32.3	100.0%	3.660	88.8	1.1	200.0	19.4					5.68	9999999	1.06	0.0643	0.0105		Soil Acquisition Area	
25	Monday	09/04/00																					No processing	
26	Tuesday	09/05/00			44180	27.8	99.9%	1.980	109.0	1.3	244.0	15.7					5.68	9999999	1.06	0.0643	0.0105		Soil Acquisition Area	
27	Wednesday	09/06/00			126000	66.1	99.9%	5.060	82.0	1.5	192.0	15.8					5.68	9999999	1.2	0.0697	0.0109			
28	Thursday	09/07/00			105000	26.3	100.0%	4.350	93.6	1.7	209.0	17.9					5.68	9999999	1.13	0.0671	0.0107		0745 to 1418hrs soil processing.	
29	Thursday	09/07/00			6164	6164	0.0%	0.244	77.6	0.0	827.0	0.0					5.68	9999999	1.37	0.0616	0.0111		Starting at 1659hrs started Slug Acquisition Test.	
30	Friday	09/08/00			85137	31857	62.6%	3.680	12.9	3.2	146.0	39.3					5.68	9999999	1.2	0.0697	0.0109			
33	Monday	09/11/00			46027	23025	50.0%	1.980	8.2	4.0	95.0	48.5					5.68	9999999	1.2	0.0697	0.0109			
34	Monday	09/11/00			12128	32.5	99.7%	0.544	13.5	3.2	104.0	44.2					5.68	9999999	1.06	0.0643	0.0105		Direct feed to SGS, no Franklin system	
35	Tuesday	09/12/00			25369	38.7	99.8%	1.140	0.0	0.0	198.0	32.0	No End of Day report				5.68	9999999	0.92	0.0583	0.01			
36	Wednesday	09/13/00	large		61799	16101	73.9%	3.110	6.4	3.1	72.4	43.4					5.68	9999999	1.06	0.0643	0.0105		Soil has mud in it.	
37	Wednesday	09/13/00	small		5206	4834	7.1%	0.283	9.0	4.7	104.0	62.9					5.68	9999999	1.06	0.0643	0.0105		Soil has mud in it.	
38	Thursday	09/14/00	S6-1		112000	63965	42.9%	4.760	28.7	3.7	298.0	23.4					5.68	9999999	1.06	0.0643	0.0105		Density of soil changed several times. Material too wet, causing gate clogging.	
39	Thursday	09/14/00	B8-2		14248	14189	0.4%	0.600	33.5	4.6	343.0	50.9			<20	<20	5.68	9999999	1.13	0.0671	0.0107		Material consistency like oatmeal, wet.	
40	Friday	09/15/00																					No processing, maintenance due to Franklin setting up new screen plant.	
43	Monday	09/18/00			11633	11633	0.0%	0.522	50.4	0.0	516.0	0.0					5.68	9999999	1.06	0.0643	0.0105		Franklin setting up new screen plant.	
44	Tuesday	09/19/00	?		87246	85769	1.7%	3.920	43.2	4.6	450.0	67.6					5.68	9999999	1.06	0.0643	0.0105			
45	Wednesday	09/20/00	?		28788	28616	0.6%	1.380	42.5	3.6	501.0	61.4					5.68	9999999	0.99	0.0643	0.0103		White pond sediment material, too wet as direct feed.	
46	Thursday	09/21/00	?		79482	32740	58.8%	3.530	19.2	9.6	232.0	119.0					15	9999999	1.13	0.0671	0.0107		Density changed at 1012hrs to 1.06, eff1=.0643, eff2=.0105. Alarm change 3x	
47	Friday	09/22/00																					No soil to process, Franklin's new plant not ready.	
50	Monday	09/25/00																					No soil to process, Franklin's new plant not ready.	
51	Tuesday	09/26/00	?		30401	30263	0.5%	1.210	23.3	8.4	251.0	96.7					5.68	9999999	1.2	0.0697	0.0109		Changed alarm to 15 pCi/g at 1044hrs.	
52	Wednesday	09/27/00	?		64661	64542	0.2%	2.690	49.0	-1.6	521.0	-8.5					15	9999999	1.13	0.0671	0.0107			
53	Thursday	09/28/00																					No processing, Franklin setting up wet screen plant.	
54	Friday	09/29/00	?		4917	4917	0.0%	0.200	42.3	0.0	-81.0	0.0					15	9999999	1.17	0.0686	0.0108	SGSk2	Wet Screen Test, No Official record.	
57	Monday	10/02/00	?		36145	36075	0.2%	1.430	40.6	14.3	-94.5	13.6					15	999999	1.2	0.0697	0.0109	SGSc2k2		
58	Tuesday	10/03/00	?		114650	114400	0.2%	4.550	34.5	-1.2	**-69.3**	**24.5**		<mda	<mda		15	999999	1.2	0.0797	0.0109	SGSc2k2	single K=2.13	
59	Wednesday	10/04/00	Slug 7-1		13196	1.85	100.0%	0.494	55.7	16.8	-400.0	-33.0					10	999999	1.27	0.0825	0.0111	SGSk2		
60	Wednesday	10/04/00	Slug 8-3		13493	13493	0.0%	0.506	24.1	0.0	-60.0	0.0					24	999999	1.27	0.0825	0.0111	SGSk2		
61	Thursday	10/05/00	S#6-3		11713	0	100.0%	0.439	0.0	21.0	273.0	265.0					50	999999	1.27	0.0825	0.0111	SGSk2	1st day running SGSk2 software. @ 1245hrs changed Alarm to 17 pCi/g.	
62	Thursday	10/05/00	B#6-3		15272	15272	0.0%	0.572	19.7	0.0	-47.0	0.0					17	999999	1.27	0.0825	0.0111	SGSk2	1st day running SGSk2 software. @ 1245hrs changed Alarm to 17 pCi/g.	
63	Friday	10/06/00	B#	47.3	47343	7332	84.5%	1.870	32.6	26.5	8.9	-91.1			<mda	<mda	20	999999	1.27	0.0825	0.0111	SGSk2		
66	Monday	10/09/00		106.0	106000	24.1	100.0%	3.970	134.0	23.7	119.0	-98.0					32	999999	1.27	0.0825	0.0111	SGSk2		
67	Tuesday	10/10/00	B#	108.1	108100	21449	80.2%	4.240	33.9	28.8	-104.0	-85.0					32	999999	1.27	0.0825	0.0111	SGSk2		
68	Wednesday	10/11/00	S#7-2	12.6	12609	0	100.0%	0.500	0.0	1.8	0.0	-2.6					5	999999	1.2	0.0797	0.0109	SGSk2		
69	Wednesday	10/11/00	Bat 7-2	62.1	62060	15611	74.8%	2.530	26.9	24.7	-45.0	-50.0					32	999999	1.27	0.0825	0.0111	SGSk2	Changed out Det# 5& 8 in sorter 1.	
70	Thursday	10/12/00	Slug-1/5		6585	6585	0.0%	0.261	5.8	0.0	0.2	0.0					5	999999	1.2	0.0841	0.0109	SGSk2	Ran 5 small slugs of soil, one file, pause for each slug.	
71	Thursday	10/12/00	Slug-2/5		7285	6866	5.8%	0.289	6.1	3.6	0.2	3.7	Must recalculate				5	999999	1.2	0.0841	0.0109	SGSk2	Ran 5 small slugs of soil, one file, pause for each slug.	
72	Thursday	10/12/00	Slug-3/5		6584	280	95.7%	0.261	6.1	1.2	0.2	7.2	Must recalculate				5	999999	1.2	0.0841	0.0109	SGSk2	Ran 5 small slugs of soil, one file, pause for each slug.	
73	Thursday	10/12/00	Slug-4/5		9107	0	100.0%	0.359	6.1	0.8	0.2	7.2	Must recalculate				5	999999	1.2	0.0841	0.0109	SGSk2	Ran 5 small slugs of soil, one file, pause for each slug.	
74	Thursday	10/12/00	Slug-5/5		9246	0	100.0%	0.370	6.1	0.8	0.2	7.0	Must recalculate				5	999999	1.2	0.0841	0.0109	SGSk2	Ran 5 small slugs of soil, one file, pause for each slug.	
75	Friday	10/13/00	Slug-1/3		8451	0	100.0%	0.317	0.0	0.6	0.0	5.5					5	999999	1.27	0.087	0.0111	SGSk2	Wetend material	
76	Friday	10/13/00	Slug-2/3		10824	10824	0.0%	0.406	27.5	0.0	-53.0	0.0					5	999999	1.27	0.087	0.0111	SGSk2	2 small runs. 2nd run, alarm set at 13.75 pCi/g. Engineered Slug	
77	Friday	10/13/00	Slug-3/3	17.9	17941	8907	50.4%	0.672	16.9	11.7	-20.0	-10.0					13.75	999999	1.27	0.087	0.0111	SGSk2	2nd run, alarm set at 13.75 pCi/g. Engineered Slug	
80	Monday	10/16/00	tockpile	119.5	119550	119440	0.092%	4.410	38.5	14.4	41.0	89.9					15	999999	1.31	0.0886	0.0112	SGSk2	13:24 density 1.24, S1-eff .0858, S2-eff .0110. Ran K8b 13:19-14:30hrs.	

APPENDIX C
NaI-GPS WALKOVER SURVEYS

Date of Survey: 8-28-00
Surface Elevation: 60' Above MSL
Survey Area: SAA-1



CPM
9400 - 20000
20001 - 40000
40001 - 60000
60001 - 100000
100001 - 300000
300001 - 500000
500001 - 999960

Radioactive Materials Area Boundary

Perimeter Fenceline

Originating File:
X:\GPS-Maywood\Projects\Pilot Demo\PD Slug Coordinates.apr

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NEW YORK DISTRICT

STONE & WEBSTER ENVIRONMENTAL TECHNOLOGY & SERVICES

Drawn by: E. Neel Date: 1-25-01
Approved: R. Skryness Date:
Reviewed by: M. Mendonca Date:
File Name: X:\GPS-Maywood\Pilot Support Documentation\Slug Locations.ppt

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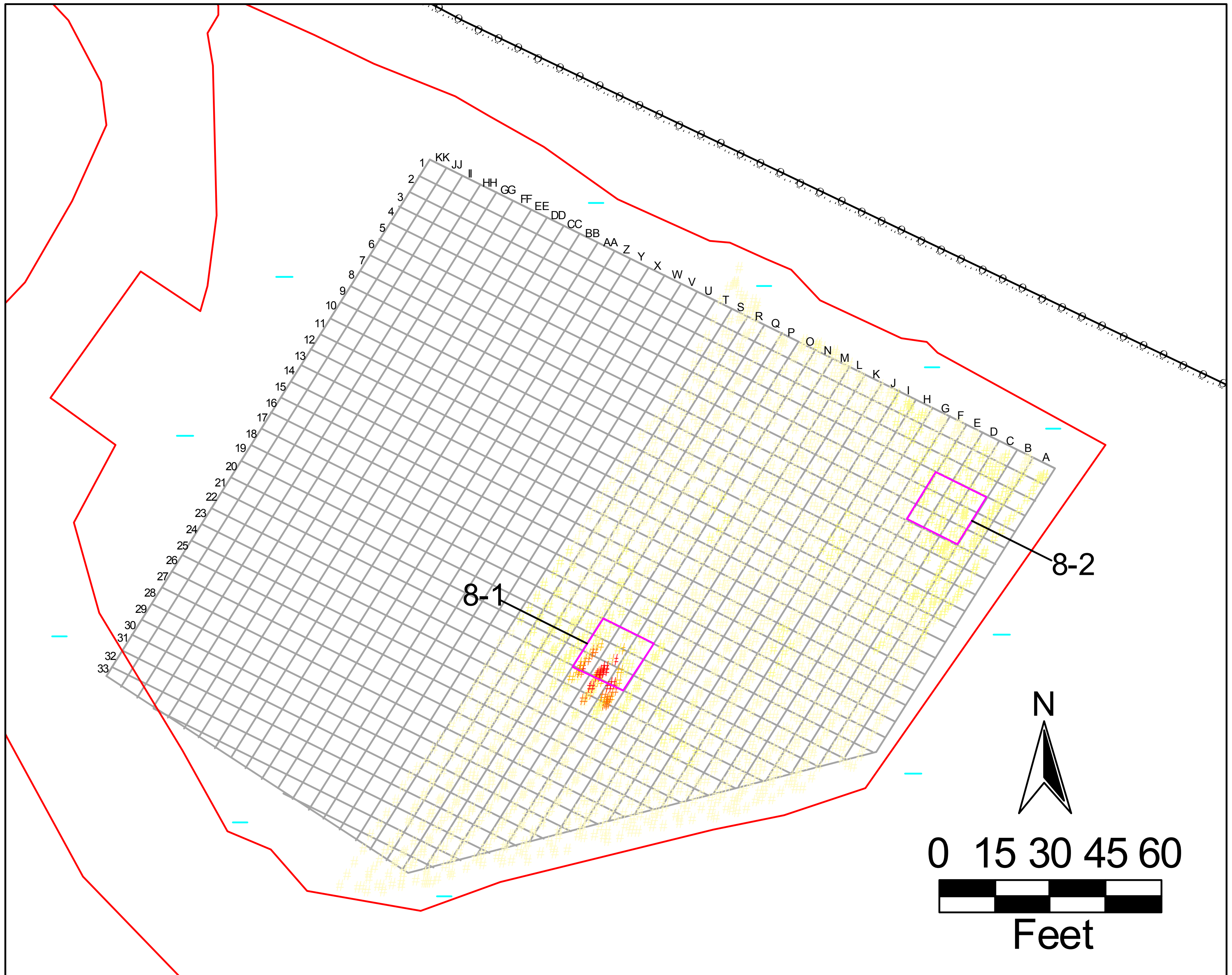
MAYWOOD, NEW JERSEY

Figure 16
Pilot Plant Demonstration
Soil Acquisition
Gamma Walkover Survey -- 8-28-00

Contract Number: DACW41-99-D-9001
Delivery Order Number:
Project Number:
Drawing Number: PPDR-16

Date of Survey: 9-7-00
Surface Elevation: 60' Above MSL
Survey Area: SAA-1



CPM

CPM
9400 - 20000
20001 - 40000
40001 - 60000
60001 - 100000
100001 - 300000
300001 - 500000
500001 - 999960

Slug Location
Radioactive Materials Area Boundary
Perimeter Fenceline

Originating File:
X:\GPS-Maywood\Projects\Pilot Demo\PD Slug Coordinates.apr

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Date: 1-25-01
Approved: R. Skryness
Date:
Reviewed by: M. Mendonca
Date:
File Name: X:\GPS-Maywood\Pilot Support Documentation\Slug Locations.ppt

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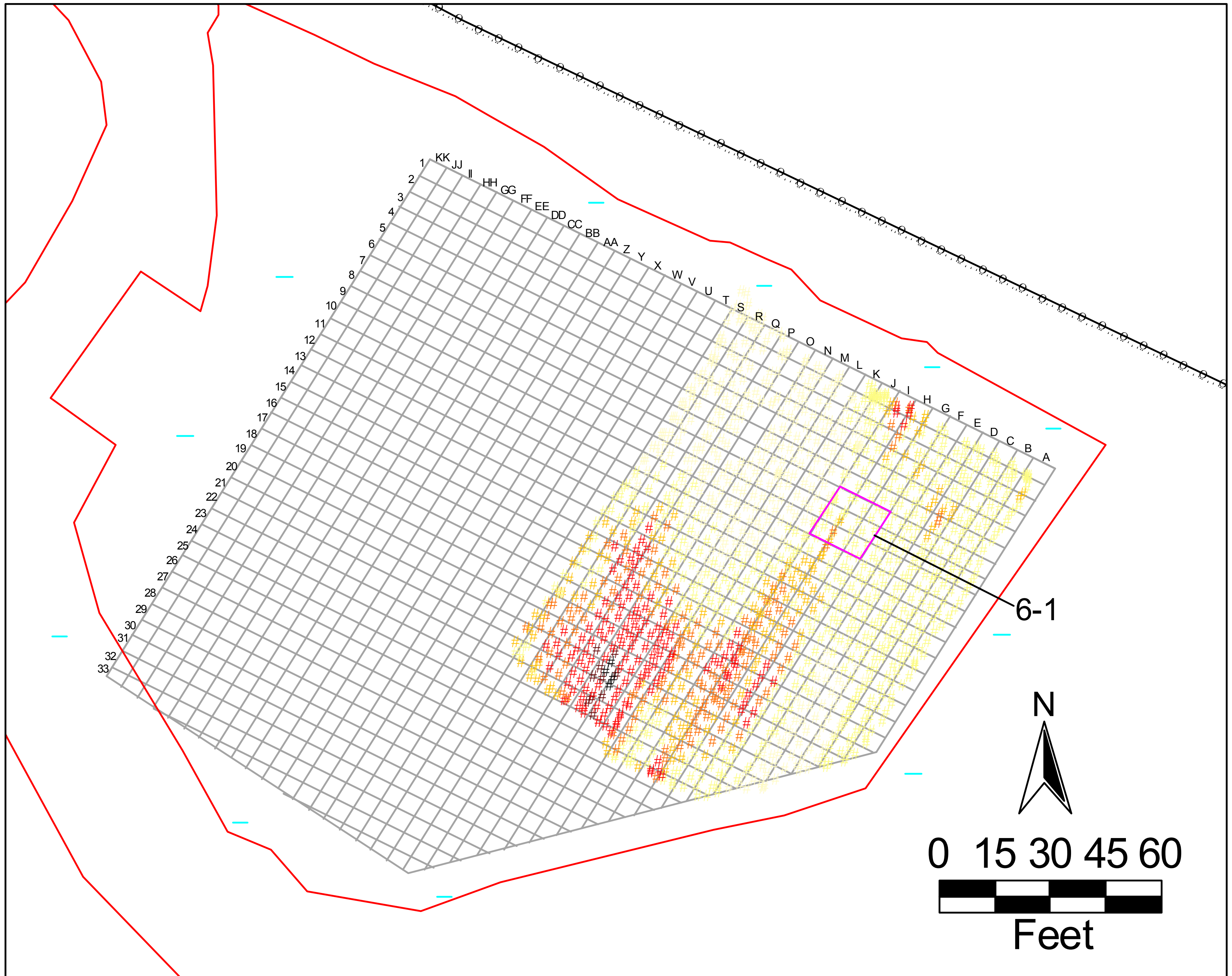
MAYWOOD, NEW JERSEY

Figure 17
Pilot Plant Demonstration
Soil Acquisition
Gamma Walkover Survey -- 9-7-00

Contract Number: DACW41-99-D-9001
Delivery Order Number:
Project Number:
Drawing Number: PPDR-17

Date of Survey: 9-14-00
Surface Elevation: 59' Above MSL
Survey Area: SAA-1



CPM
9400 - 20000
20001 - 40000
40001 - 60000
60001 - 100000
100001 - 300000
300001 - 500000
500001 - 999960

Slug Location
Radioactive Materials Area Boundary
Perimeter Fenceline

Originating File:
X:\GPS-Maywood\Projects\Pilot Demo\PD Slug Coordinates.apr

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Approved: R. Skryness Date:
Reviewed by: M. Mendonca Date:
File Name: X:\GPS-Maywood\Pilot Support Documentation\Slug Locations.ppt

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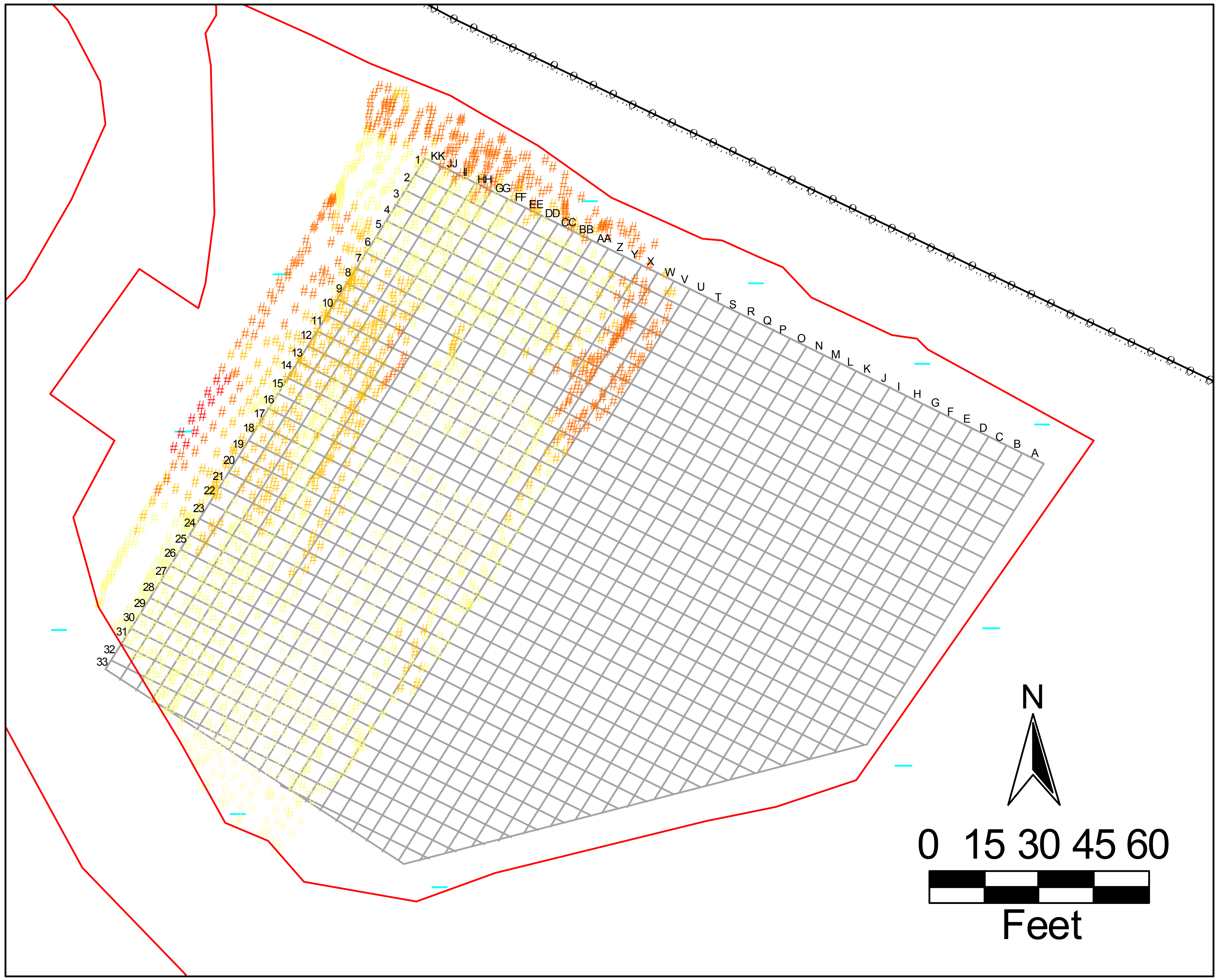
Figure 18
Pilot Plant Demonstration
Soil Acquisition
Gamma Walkover Survey -- 9-14-00

Contract Number: DACW41-99-D-9001
Delivery Order Number:
Project Number:
Drawing Number: PPDR-18

Date of Survey: 9-22-00
Surface Elevation: 62' Above MSL
Survey Area: SAA-2



CPM
9400 - 20000
20001 - 40000
40001 - 60000
60001 - 100000
100001 - 300000
300001 - 500000
500001 - 999960

Radioactive Materials Area Boundary
Perimeter Fenceline

Originating File:
X:\GPS-Maywood\Projects\Pilot Demo\PD Slug Coordinates.apr

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Date:
Reviewed by: M. Mendonca
Date:
File Name: X:\GPS-Maywood\Pilot Support Documentation\Slug Locations.ppt

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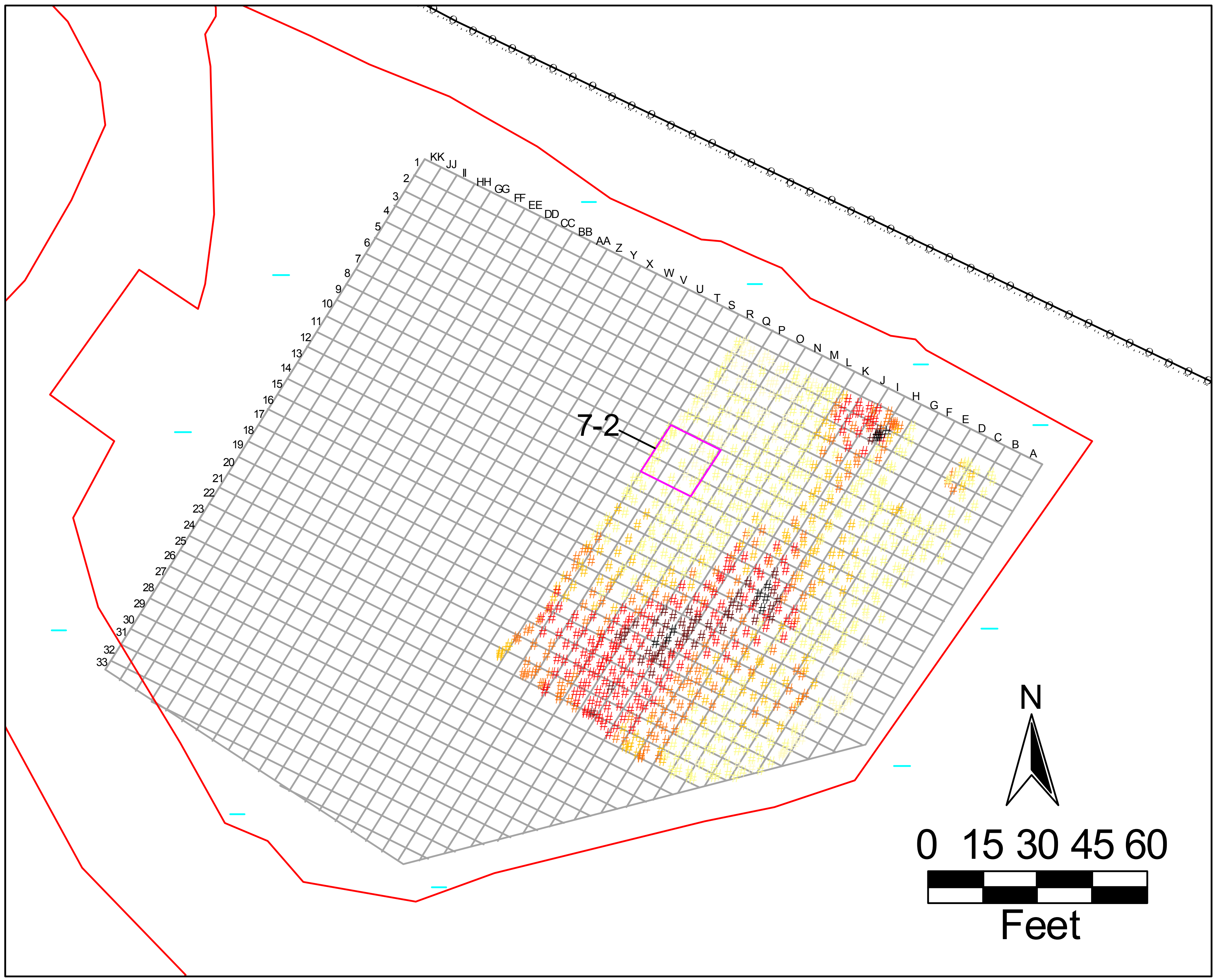
Figure 19
Pilot Plant Demonstration
Soil Acquisition
Gamma Walkover Survey -- 9-22-00

Contract Number: DACW41-99-D-9001
Delivery Order Number:
Project Number:
Drawing Number: PPDR-19

Date of Survey: 9-28-00
Surface Elevation: 57' Above MSL
Survey Area: SAA-1



CPM
9400 - 20000
20001 - 40000
40001 - 60000
60001 - 100000
100001 - 300000
300001 - 500000
500001 - 999960

Slug Location
Radioactive Materials Area Boundary
Perimeter Fenceline

Originating File:
X:\GPS-Maywood\Projects\Pilot Demo\PD Slug Coordinates.apr

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Approved: R. Skryness | Date:
File Name: X:\GPS-Maywood\Pilot Support Documentation\Slug Locations.ppt

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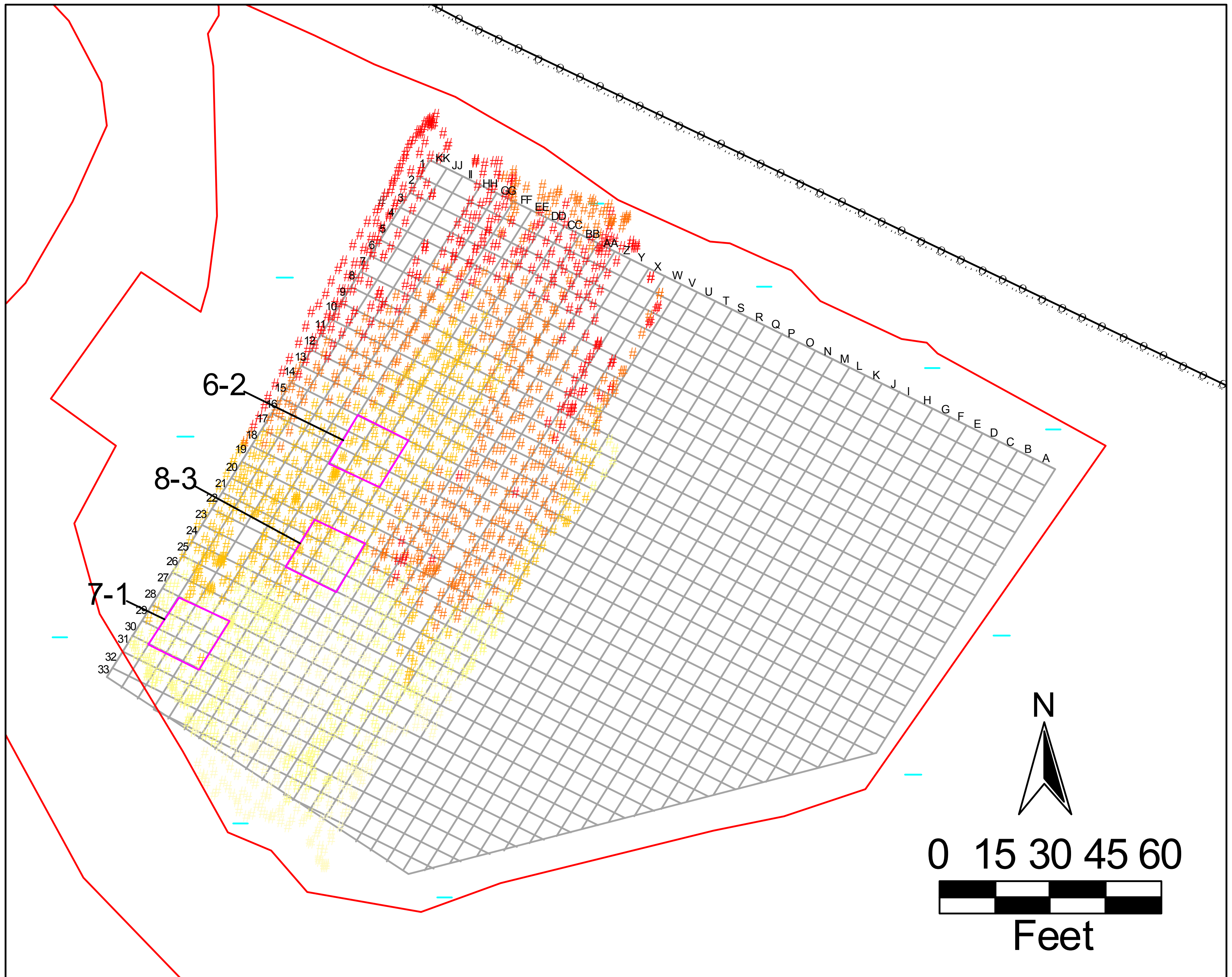
Figure 20
Pilot Plant Demonstration
Soil Acquisition
Gamma Walkover Survey -- 9-28-00

Contract Number: DACW41-99-D-9001
Delivery Order Number:
Project Number:
Drawing Number: PPDR-20

Date of Survey: 9-29-00
Surface Elevation: 62' Above MSL
Survey Area: SAA-2



CPM
9400 - 20000
20001 - 40000
40001 - 60000
60001 - 100000
100001 - 300000
300001 - 500000
500001 - 999960

- Slug Location
- Radioactive Materials Area Boundary
- Perimeter Fenceline

Originating File:
X:\GPS-Maywood\Projects\Pilot Demo\PD Slug Coordinates.apr

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Reviewed by: M. Mendonca | Date: | File Name: X:\GPS-Maywood\Pilot Support Documentation\Slug Locations.ppt

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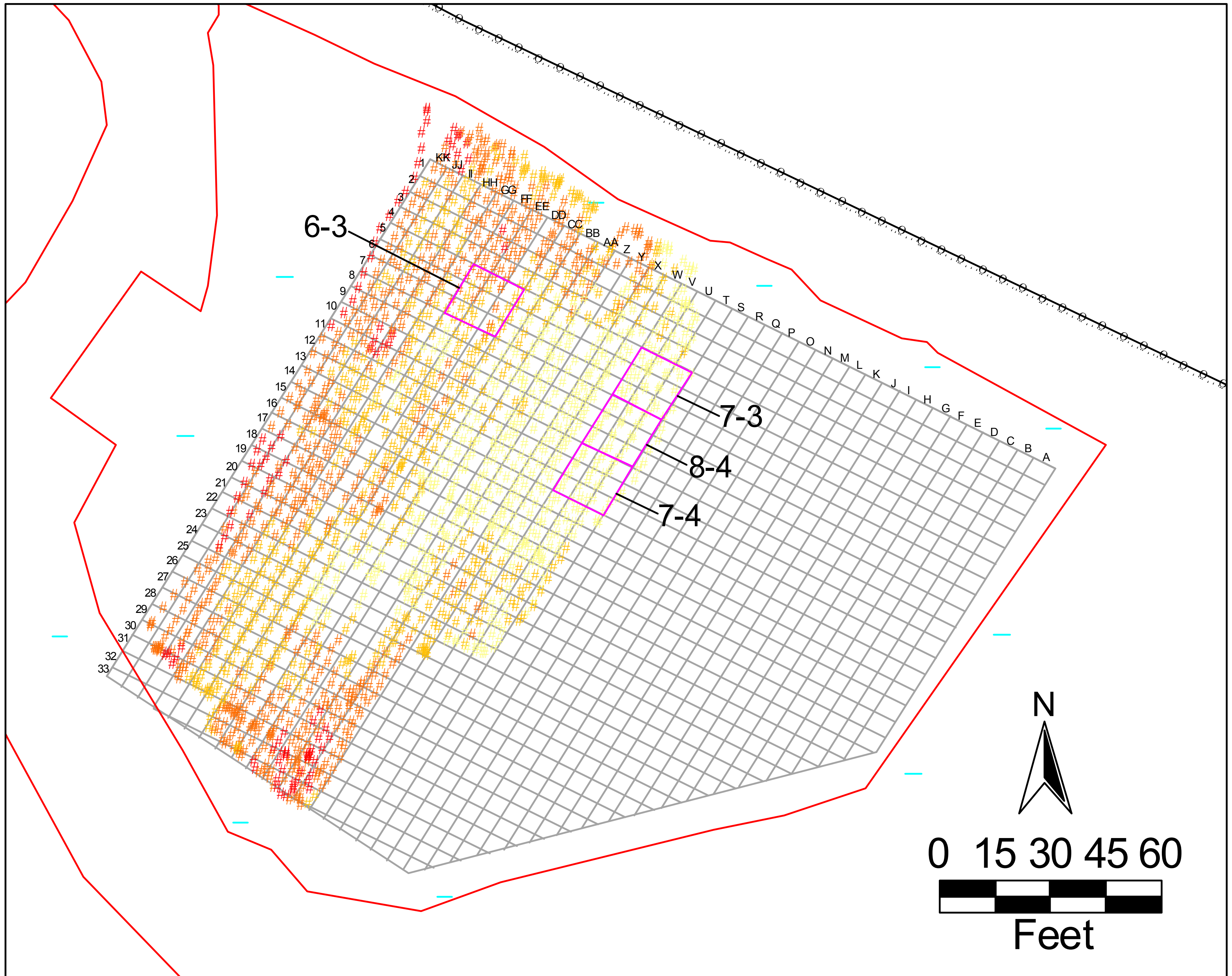
Figure 21

Pilot Plant Demonstration
Soil Acquisition
Gamma Walkover Survey -- 9-29-00

Contract Number: DACW41-99-D-9001
Delivery Order Number:
Project Number:
Drawing Number: PPDR-21

Date of Survey: 10-16-00
Surface Elevation: 60' Above MSL
Survey Area: SAA-2



CPM
9400 - 20000
20001 - 40000
40001 - 60000
60001 - 100000
100001 - 300000
300001 - 500000
500001 - 999960

Slug Location
Radioactive Materials Area Boundary
Perimeter Fenceline

Originating File:
X:\GPS-Maywood\Projects\Pilot Demo\PD Slug Coordinates.apr

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Date: 1-25-01
Approved: R. Skryness
Date:
Reviewed by: M. Mendonca
Date:
File Name: X:\GPS-Maywood\Pilot Support Documentation\Slug Locations.ppt

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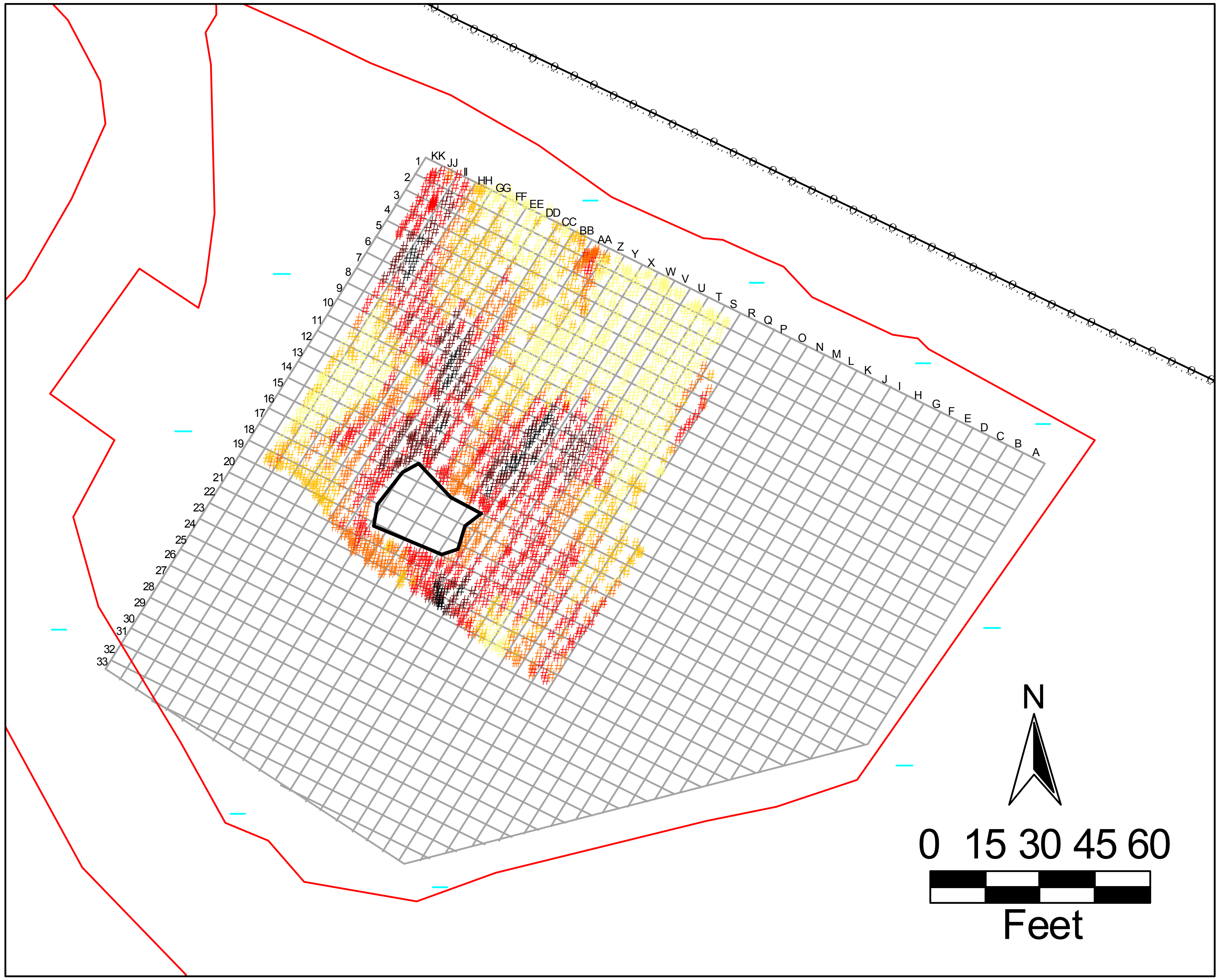
Figure 22
Pilot Plant Demonstration
Soil Acquisition
Gamma Walkover Survey -- 10-16-00

Contract Number: DACW41-99-D-9001
Delivery Order Number:
Project Number:
Drawing Number: PPDR-22

Date of Survey: 11-13-00
Surface Elevation: 57' Above MSL
Survey Area: SAA-2



CPM

- 9400 - 20000
- 20001 - 40000
- 40001 - 60000
- 60001 - 100000
- 100001 - 300000
- 300001 - 500000
- 500001 - 999960

- Location of Buried Drum(s)
- Radioactive Materials Area Boundary
- Perimeter Fenceline

Originating File:
X:\GPS-Maywood\Projects\Pilot Demo\PD Slug Coordinates.apr

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Drawn by: E. Neel Date: 1-25-01
Approved: R. Skryness Date:
Reviewed by: M. Mendonca Date:
File Name: X:\GPS-Maywood\Pilot Support Documentation\Slug Locations.ppt

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Figure 23
Pilot Plant Demonstration
Soil Acquisition
Gamma Walkover Survey -- 11-13-00

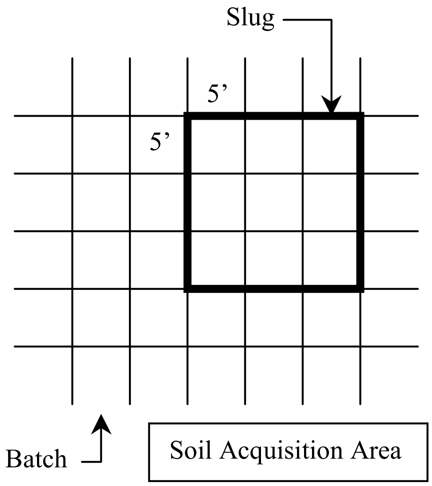
Contract Number: DACW41-99-D-9001
Delivery Order Number:
Project Number:
Drawing Number: PPDR-23

APPENDIX D
GENERAL SOIL ACQUISTITION SAMPLING SEQUENCE FOR PILOT DEMONSTRATION

GENERAL SOIL ACQUISITION SAMPLING SEQUENCE FOR PILOT DEMONSTRATION

SOIL ACQUISITION – SLUG AND BATCH:

Steps 1 – 4:



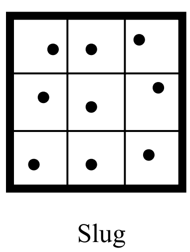
1. Set up a 5’ by 5’ grid system in the soil acquisition area.

2. Obtain a 100% scan of the footprint of the soil acquisition area using a NaI detector linked to GPS. This is done by walking at a constant pace across each grid in the soil acquisition footprint. (Refer to SOP SW-MWD-111-0)

3. Review the data collected from the scan – identify the batch(es) to meet the proposed scenarios such as: all above criteria, all below criteria, mixed, all certain type of material, etc. The batch will be used to evaluate the effectiveness of the systems and look at the economics of implementing them, such as operational costs and options for final disposition of the processed materials. Material deemed unprocessable, either because it is highly contaminated or already below criteria or else it consists of debris will not be considered as part of the batch and will be excavated and stockpiled separately.

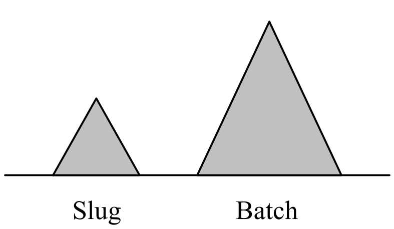
4. Within each identified batch, select a slug consisting of a set number of grids (e.g. 9 grids total, 3 grids by 3 grids in size). Mark the boundaries of this material. The slug will be used to track the activity of the material entering and exiting the processing systems in order to determine the degree of homogenization that soils handling and processing has on the selected soil.

Step 5:



5. Within each grid for the slug, re-scan the grid and collect a sample corresponding to the location of the average count rate for the respective grid. (Refer to SOP SW-MWD-307-0; Note that only <3/8 inch material is to be sampled because the majority of the radioactivity is believed to be associated with the <3/8 inch material and the geometry of the sample container places constraints on the size of the material analyzed.) This sample is to be analyzed by the onsite laboratory using gamma spectroscopy. Thus, for the example provided, 9 total samples will be collected for each slug. This sampling will facilitate determining the curie concentration of the slug prior to processing.

Steps 6 – 8:



Note: Material not suitable for processing is stockpiled separately from the slug and the batch.

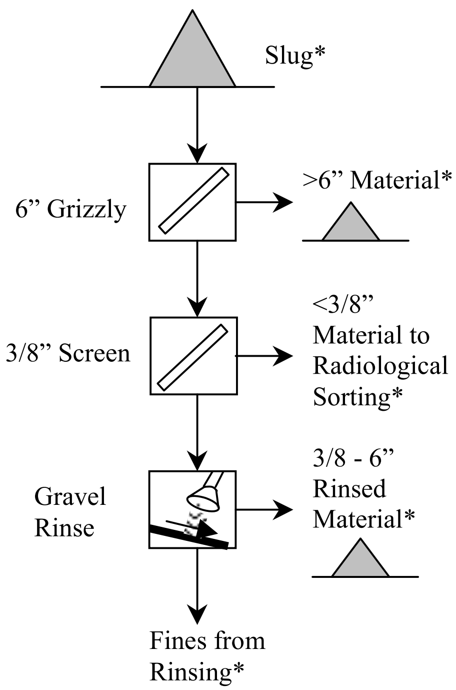
6. Excavate the slug first (ahead of the remainder of the batch) and stockpile it separately to prepare for processing. It will be processed first.

7. Material unsuitable for processing is then removed from the remainder of the batch and placed into separate stockpiles. This material will be characterized and disposed of directly without processing.

8. Excavate the remainder of the batch and stockpile it separately from the slug. It will be processed once the slug is complete.

GENERAL SLUG SAMPLING SEQUENCE FOR PILOT DEMONSTRATION

Gravel Separation
Steps 1 – 3:



* Obtain Weight of Material after Processing is Complete

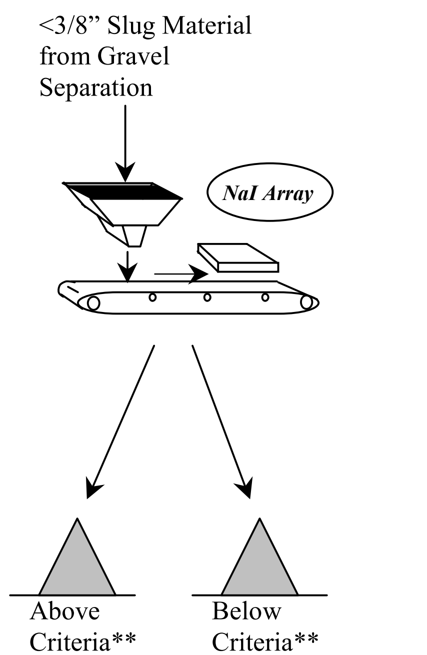
SOIL PROCESSING – GRAVEL SEPARATION - SLUG:

1. Begin loading the slug into the gravel separation system feed hopper. Weigh the material as it is loaded. This information will be used to track the weight of the material being processed. It will also be used in association with the previously obtained gamma spectroscopy results of the 9 soil samples to calculate the total activity of the slug.

2. The material will be separated into 4 streams. The streams are:
   - >6 inch material separated by the grizzly
   - <3/8 inch material which will be conveyed to the radiological sorting system
   - 3/8 - 6 inch material rinsed to remove fines
   - fines rinsed from the 3/8 - 6 inch material

3. Once the processing of the slug is complete, tally the weights of the >6 inch material, <3/8 inch material which proceeds to the radiological sorting system, and the 3/8 – 6 inch material that has been rinsed. Also weigh the fines resulting from the rinsing. This information will be used to track the weight of the material being processed.

Radiological Sorting
Steps 1 – 4:



** Obtain Weight and Collect Sample of Material after Processing is Complete

SOIL PROCESSING – RADIOLOGICAL SORTING - SLUG:

1. The <3/8 inch material from the slug is conveyed from the gravel separation system into the radiological sorting system.

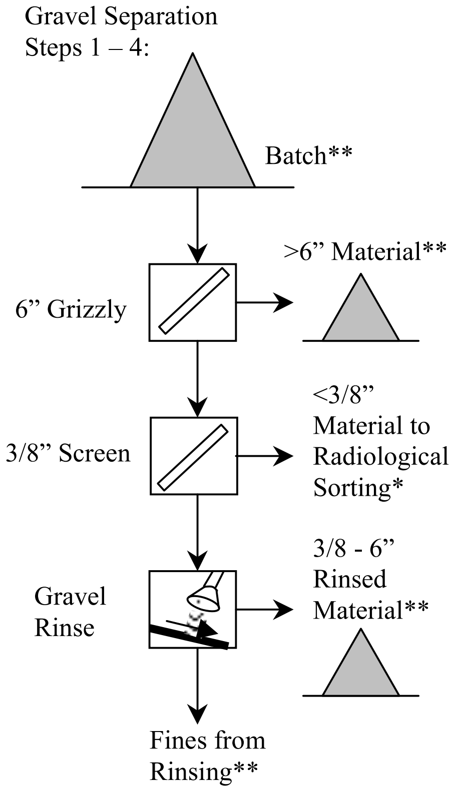
2. The equipment will sort the remainder of the slug into 2 streams. They are (1) above criteria soils and (2) below criteria soils.

3. Once the processing of the slug is complete, tally the weights of the material in each stockpile. This information will be used to track the weight of the material being processed and facilitate calculating the total activity of the slug.

4. Collect one sample from each stockpile. (Refer to SW-MWD-314-0) This information in association with the weights of the piles will be used to calculate the total activity of the <3/8 inch material for the slug.

5. For the activity tracking, compare the total activity calculated for the slug following processing with that calculated prior to processing.

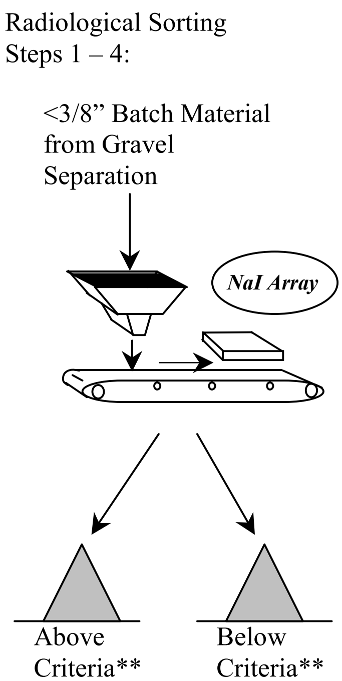
GENERAL BATCH SAMPLING SEQUENCE FOR PILOT DEMONSTRATION



* Obtain Weight of Material after Processing is Complete
** Obtain Weight and Collect Sample(s) of Material after Processing is Complete

SOIL PROCESSING – GRAVEL SEPARATION - BATCH:

1. After the slug has been processed, load the remainder of the batch into the gravel separation system. Weigh the material as it is loaded. This information will be used to track the weight of the batch.
2. The material will be separated into 4 streams. The streams are:
   - >6 inch material separated by the grizzly
   - <3/8 inch material which will be conveyed to the radiological sorting system
   - 3/8 - 6 inch material rinsed to remove fines
   - fines rinsed from the 3/8 - 6 inch material
3. Once the batch is through the gravel separation system, tally the weights of the >6 inch material, <3/8 inch material which proceeds to the radiological sorting system, and the 3/8 – 6 inch material. Also weigh the fines resulting from the rinsing. This information will be used to track the weight of the material being processed.
4. Collect samples of the >6 inch material, 3/8 - 6 inch material, and the fines resulting from the rinsing. (Refer to SW-MWD-312-0 and SW-MWD-314-0) Collect these samples at a frequency of the lesser of 1 sample per batch or every 50 cubic yards of separated material (if the individual stockpiles exceed 50 cubic yards). This sample data will be used to evaluate options for final disposition of the processed materials.
5. Other special samples may also be collected in accordance with the SAP at intermediate points in the process.



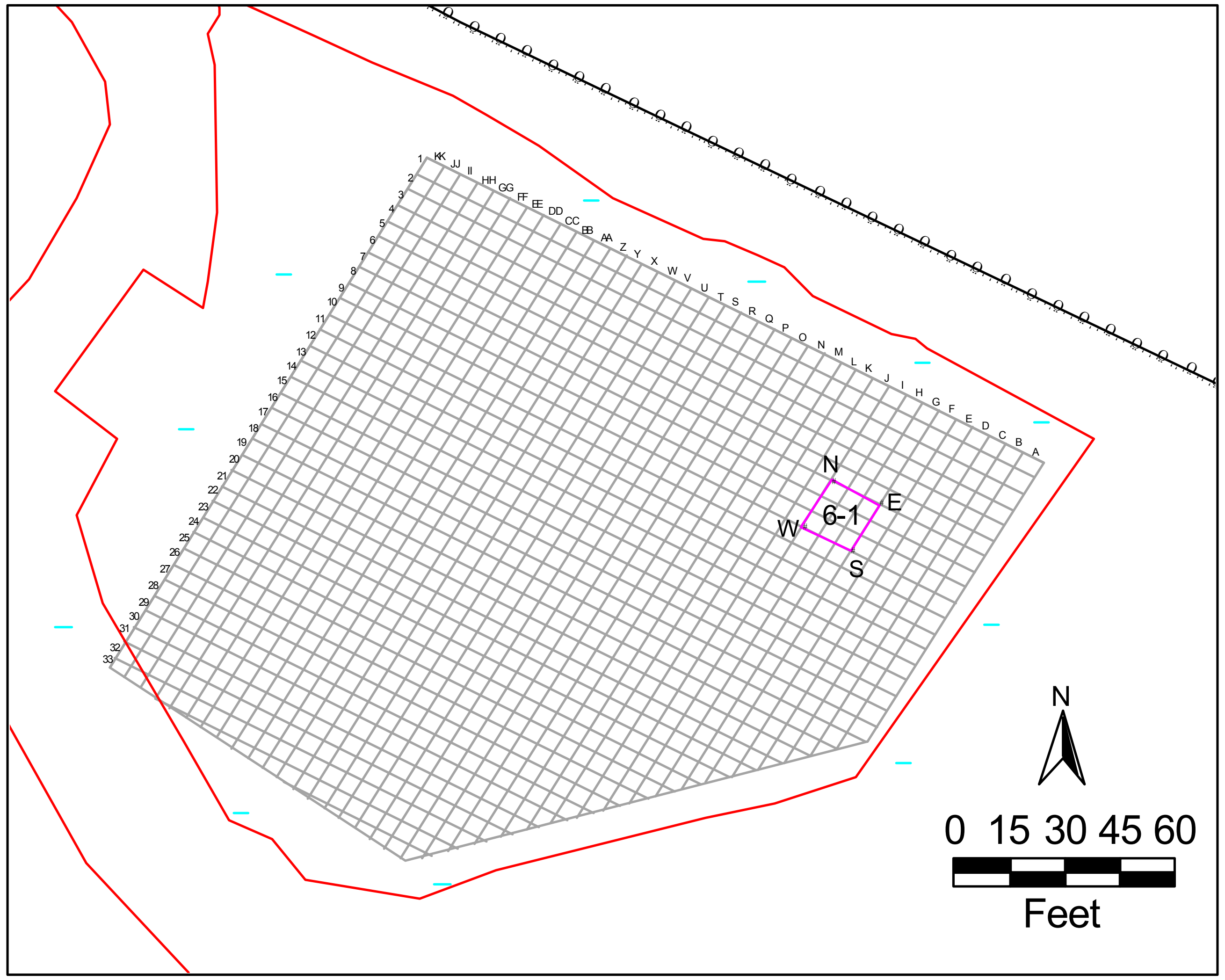
** Obtain Weight and Collect Sample(s) of Material after Processing is Complete

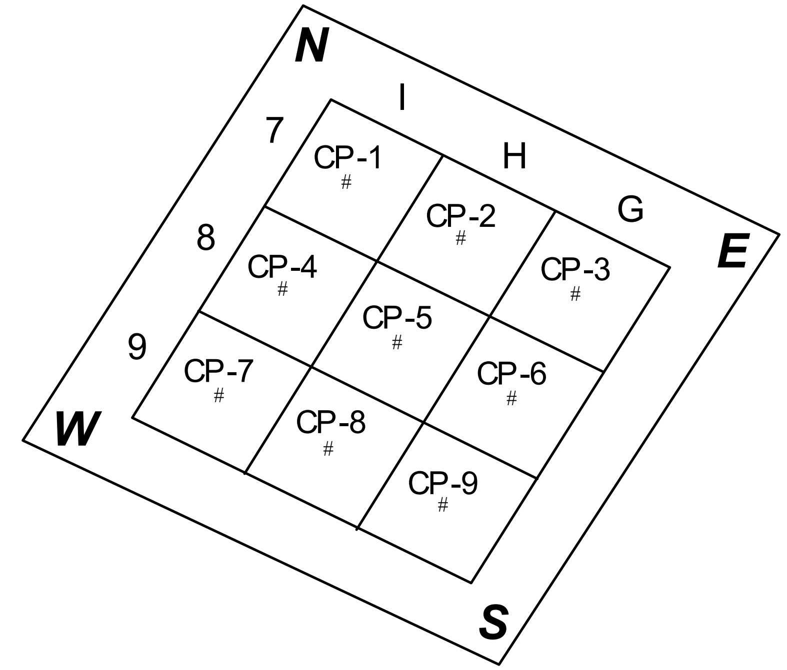
SOIL PROCESSING – RADIOLOGICAL SORTING - BATCH:

1. The <3/8 inch material from the batch is conveyed from the gravel separation system into the radiological sorting system.
2. The equipment will sort the remainder of the batch into 2 streams. They are (1) above criteria soils and (2) below criteria soils.
3. Once the processing of the batch is complete, tally the weights of the material in each stockpile. This information will be used to track the weight of the material being processed.
4. Collect one sample from each stockpile. (Refer to SW-MWD-314-0) Collect these samples at a frequency of the lesser of 1 sample per batch or every 50 cubic yards of separated material (if the individual stockpiles exceed 50 cubic yards). This sample data will be used to evaluate options for final disposition of the processed materials.
5. Other special samples may also be collected in accordance with the SAP at intermediate points in the process.
6. Since the batch will be used to evaluate the system under conditions similar to those expected during full-scale operation, following processing compare: the weights of the pre- and post-processed materials to assess effectiveness; the actual throughput to the rated throughput to assess efficiency; and sample data to determine disposal options and their economics.

APPENDIX E
SLUG COORDINATES & WALKOVER SURVEYS

Date Processed: 9-14-00
Beginning Elevation: 59' Above MSL
Slug/Batch Depth - 2'





Point Number	Grid I. D.	Coordinates	
		Northing	Easting
CP-1	I - 7	752 711.87	2164 721.08
CP-2	H - 7	752 709.66	2164 725.59
CP-3	G - 7	752 707.45	2164 730.10
CP-4	I - 8	752 707.61	2164 718.41
CP-5	H - 8	752 705.40	2164 722.92
CP-6	G - 8	752 703.19	2164 727.43
CP-7	I - 9	752 703.35	2164 715.74
CP-8	H - 9	752 701.14	2164 720.25
CP-9	G - 9	752 698.93	2164 724.76

Point I. D.	Coordinates	
	Northing	Easting
N	752 715.20	2164 720.16
E	752 708.44	2164 733.67
S	752 695.66	2164 725.67
W	752 702.34	2164 712.16

Legend:
- Slug 6-1
- Radioactive Materials Area Boundary
- Perimeter Fenceline
- # Center Point of Grid Square (CP)

Originating File:
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Reviewed by: M. Mendonca | Date:

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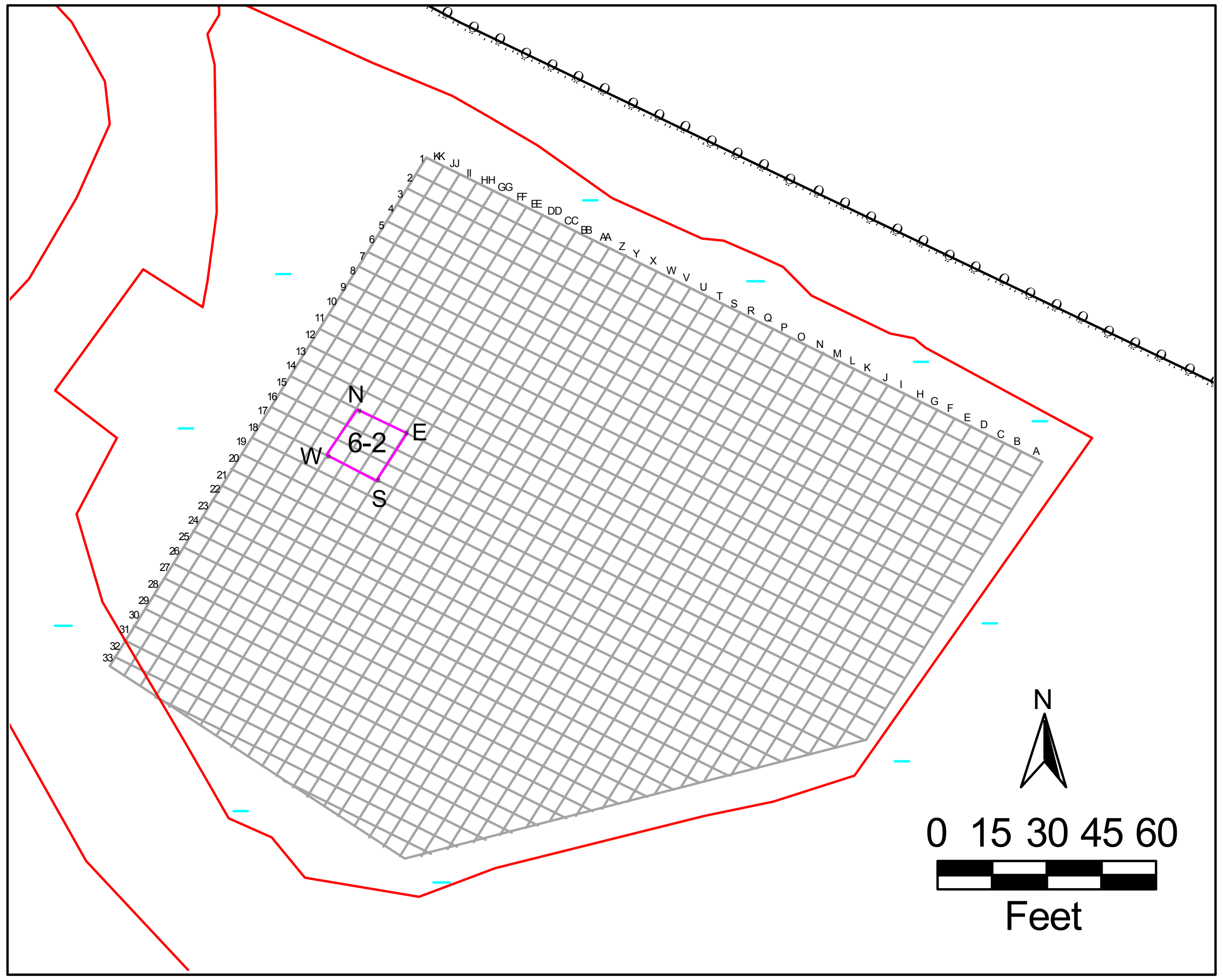
MAYWOOD, NEW JERSEY

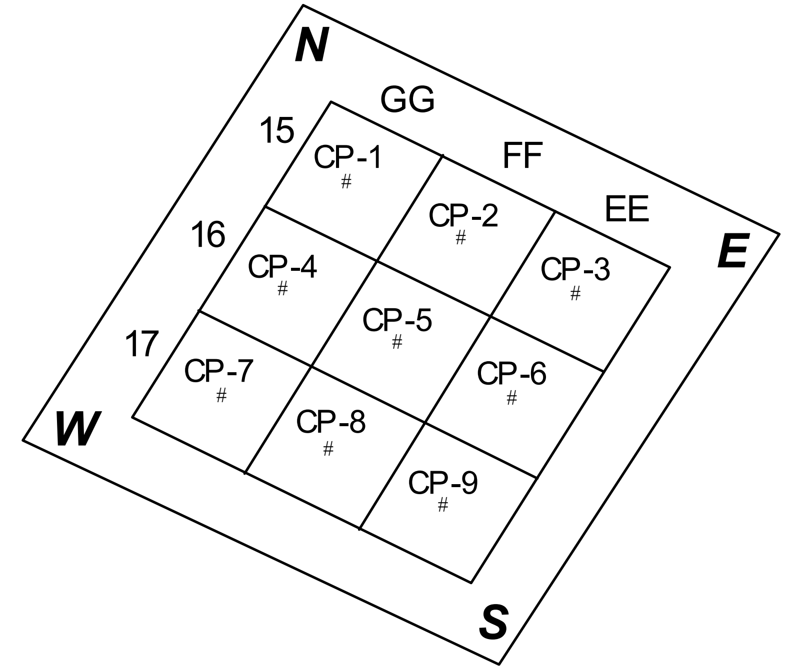
Figure 1
Pilot Plant Demonstration
Soil Acquisition
Slug Locations -- Slug/Batch 6-1

Contract Number: DACW41-99-D-9001
Delivery Order Number:
Project Number:
Drawing Number: PPDR-1

Date Processed: 10-5-00
Beginning Elevation: 62' Above MSL
Slug/Batch Depth - 2'



Point I. D.	Coordinates	
	Northing	Easting
N	752 734.46	2164 590.70
E	752 727.78	2164 604.21
S	752 715.00	2164 596.21
W	752 721.68	2164 582.70



Point Number	Grid I. D.	Coordinates	
		Northing	Easting
CP-1	GG - 15	752 731.21	2164 591.61
CP-2	FF - 15	752 729.00	2164 596.12
CP-3	EE - 15	752 726.79	2164 600.63
CP-4	GG - 16	752 726.95	2164 588.94
CP-5	FF - 16	752 724.74	2164 593.45
CP-6	EE - 16	752 722.53	2164 597.96
CP-7	GG - 17	752 722.69	2164 586.27
CP-8	FF - 17	752 720.48	2164 590.78
CP-9	EE - 17	752 718.27	2164 595.29

Legend:
- Slug 6-2
- Radioactive Materials Area Boundary
- Perimeter Fenceline
- # Center Point of Grid Square (CP)

Originating File:
X:\GPS-Maywood\Projects\Pilot Demo\PD Slug Coordinates.apr

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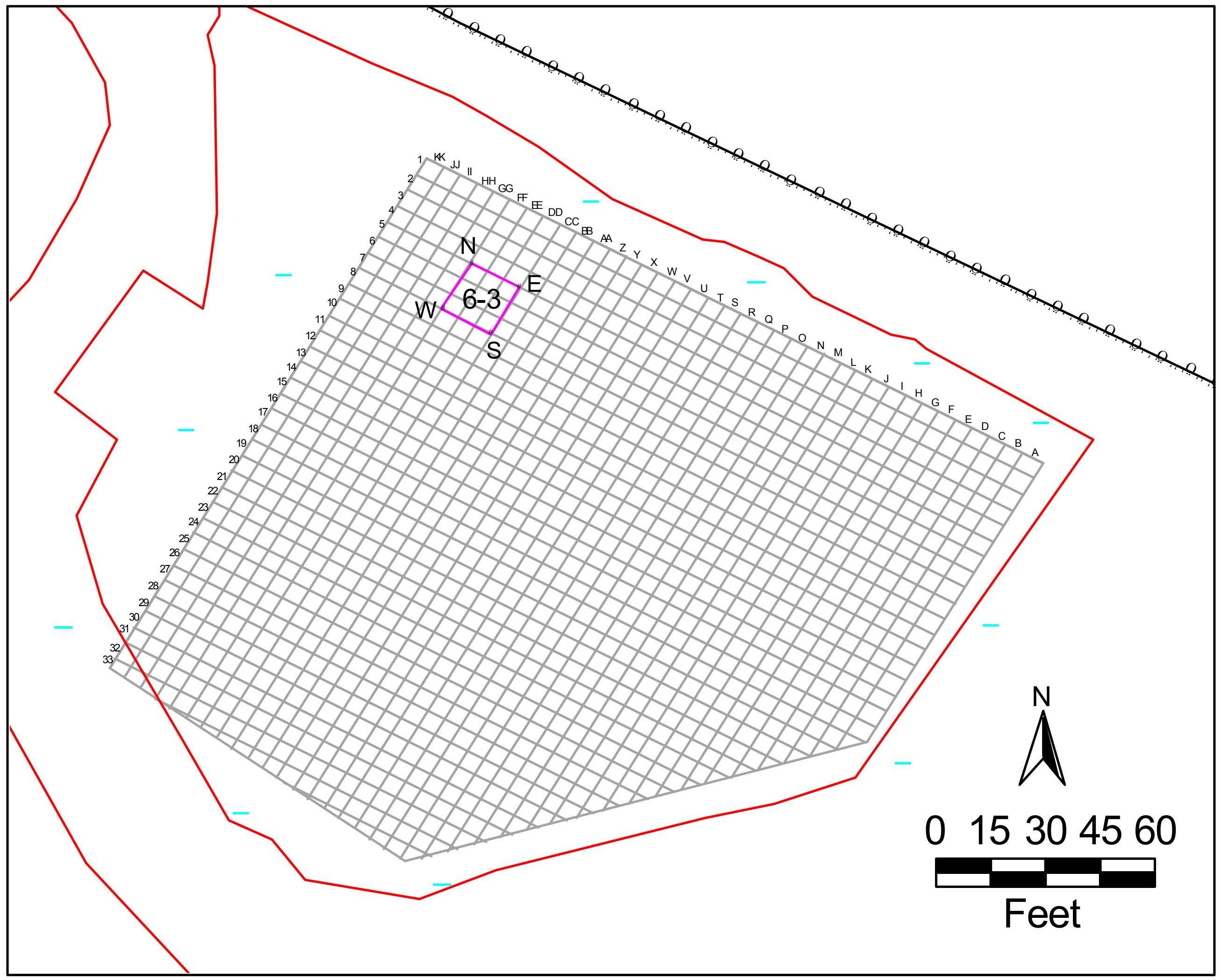
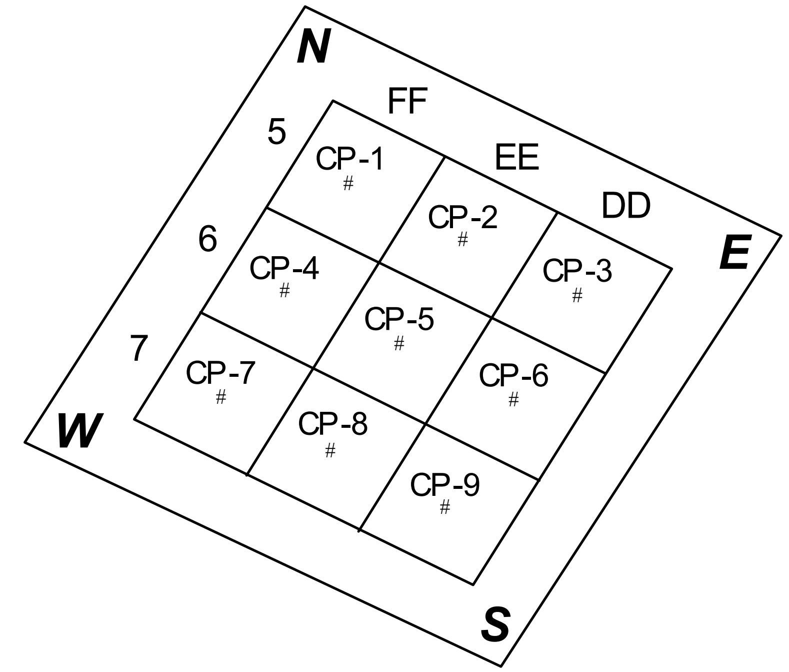
Figure 2
Pilot Plant Demonstration
Soil Acquisition
Slug Locations -- Slug/Batch 6-2

Contract Number: DACW41-99-D-9001
Delivery Order Number:
Project Number:
Drawing Number: PPDR-2

Date Processed: 10-20-00
Beginning Elevation: 60' Above MSL
Slug/Batch Depth - 3'





Point I. D.	Coordinates	
	Northing	Easting
N	752 774.83	2164 621.86
E	752 768.15	2164 635.38
S	752 755.37	2164 627.38
W	752 762.05	2164 613.86

Point Number	Grid I. D.	Coordinates	
		Northing	Easting
CP-1	FF - 5	752 771.58	2164 622.79
CP-2	EE - 5	752 769.37	2164 627.29
CP-3	DD - 5	752 767.15	2164 631.80
CP-4	FF - 6	752 767.33	2164 620.11
CP-5	EE - 6	752 765.11	2164 624.63
CP-6	DD - 6	752 762.89	2164 629.14
CP-7	FF - 7	752 763.07	2164 617.44
CP-8	EE - 7	752 760.85	2164 621.96
CP-9	DD - 7	752 758.61	2164 626.47

Slug 6-3
Radioactive Materials Area Boundary
Perimeter Fenceline
Center Point of Grid Square (CP)

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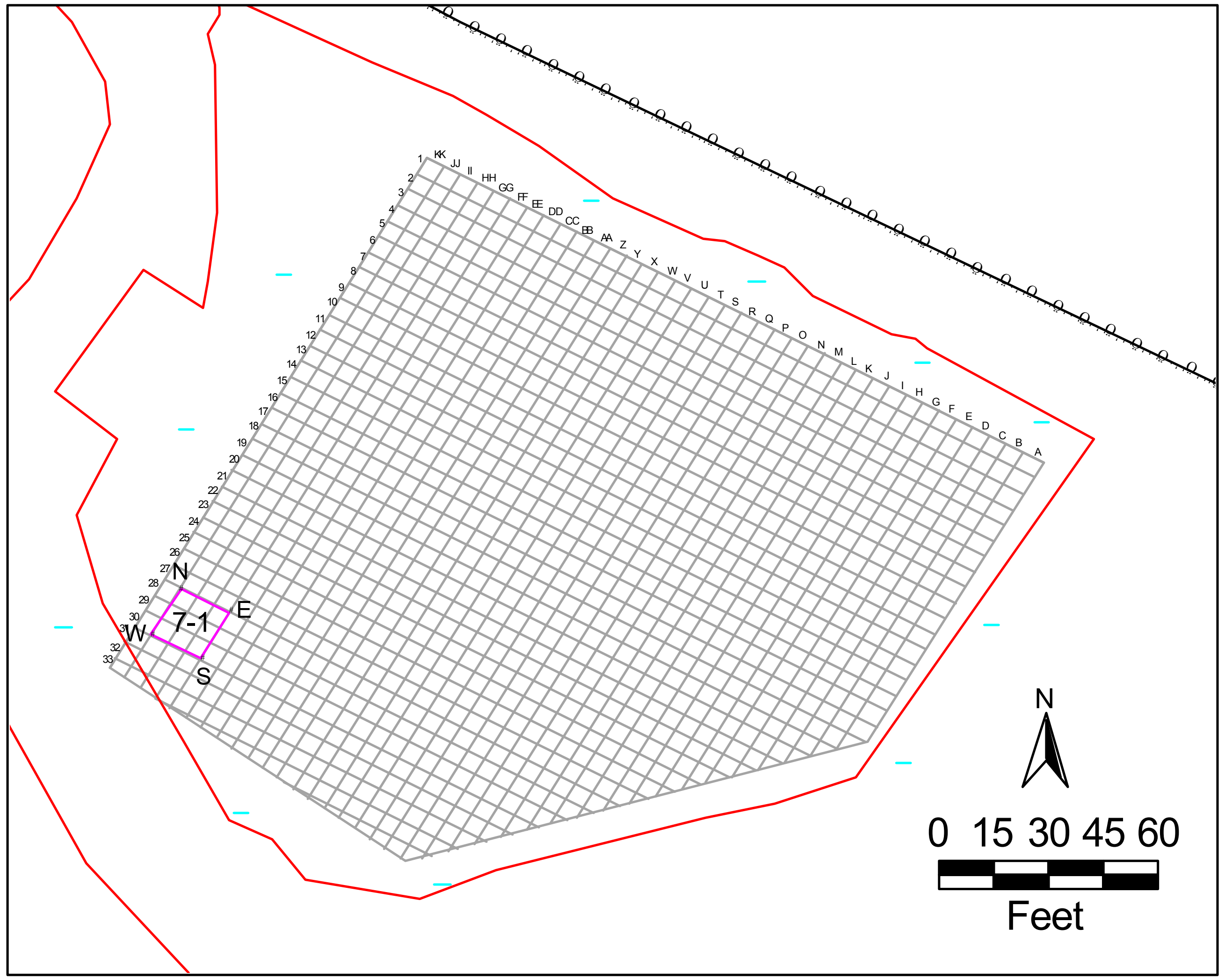
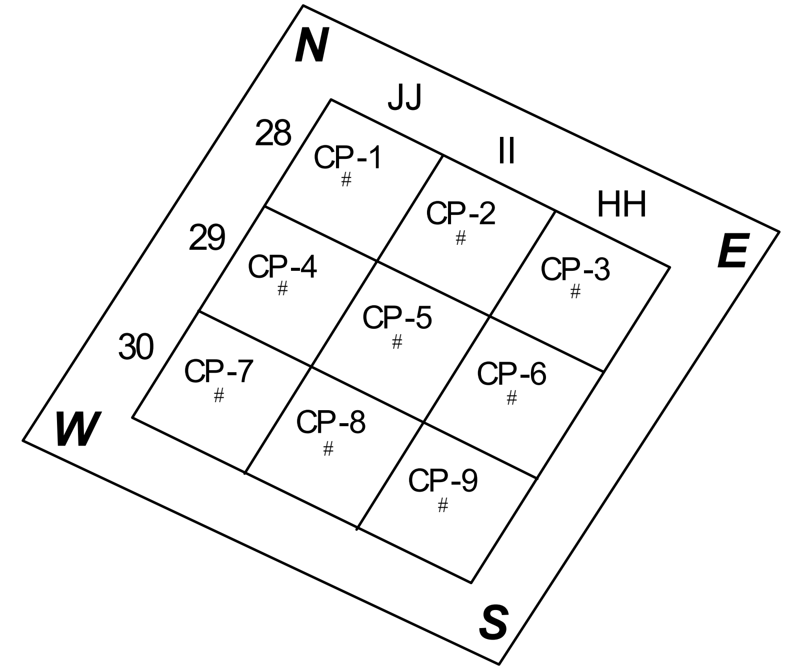
Figure 3
Pilot Plant Demonstration
Soil Acquisition
Slug Locations -- Slug/Batch 6-3

Contract Number: DACW41-99-D-9001
Delivery Order Number:
Project Number:
Drawing Number: PPDR-3

Date Processed: 10-4-00
Beginning Elevation: 62' Above MSL
Slug/Batch Depth - 2'





Point Number	Grid I. D.	Coordinates	
		Northing	Easting
CP-1	JJ - 28	752 682.52	2164 543.44
CP-2	II - 28	752 680.31	2164 547.95
CP-3	HH - 28	752 678.10	2164 552.46
CP-4	JJ - 29	752 678.26	2164 540.77
CP-5	II - 29	752 676.05	2164 545.28
CP-6	HH - 29	752 673.84	2164 549.79
CP-7	JJ - 30	752 674.00	2164 538.10
CP-8	II - 30	752 671.79	2164 542.61
CP-9	HH - 30	752 669.58	2164 547.12

Point I. D.	Coordinates	
	Northing	Easting
N	752 685.76	2164 542.52
E	752 679.08	2164 556.04
S	752 666.30	2164 548.04
W	752 672.98	2164 534.52

Legend:
- Slug 7-1
- Radioactive Materials Area Boundary
- Perimeter Fenceline
- # Center Point of Grid Square (CP)

Originating File:
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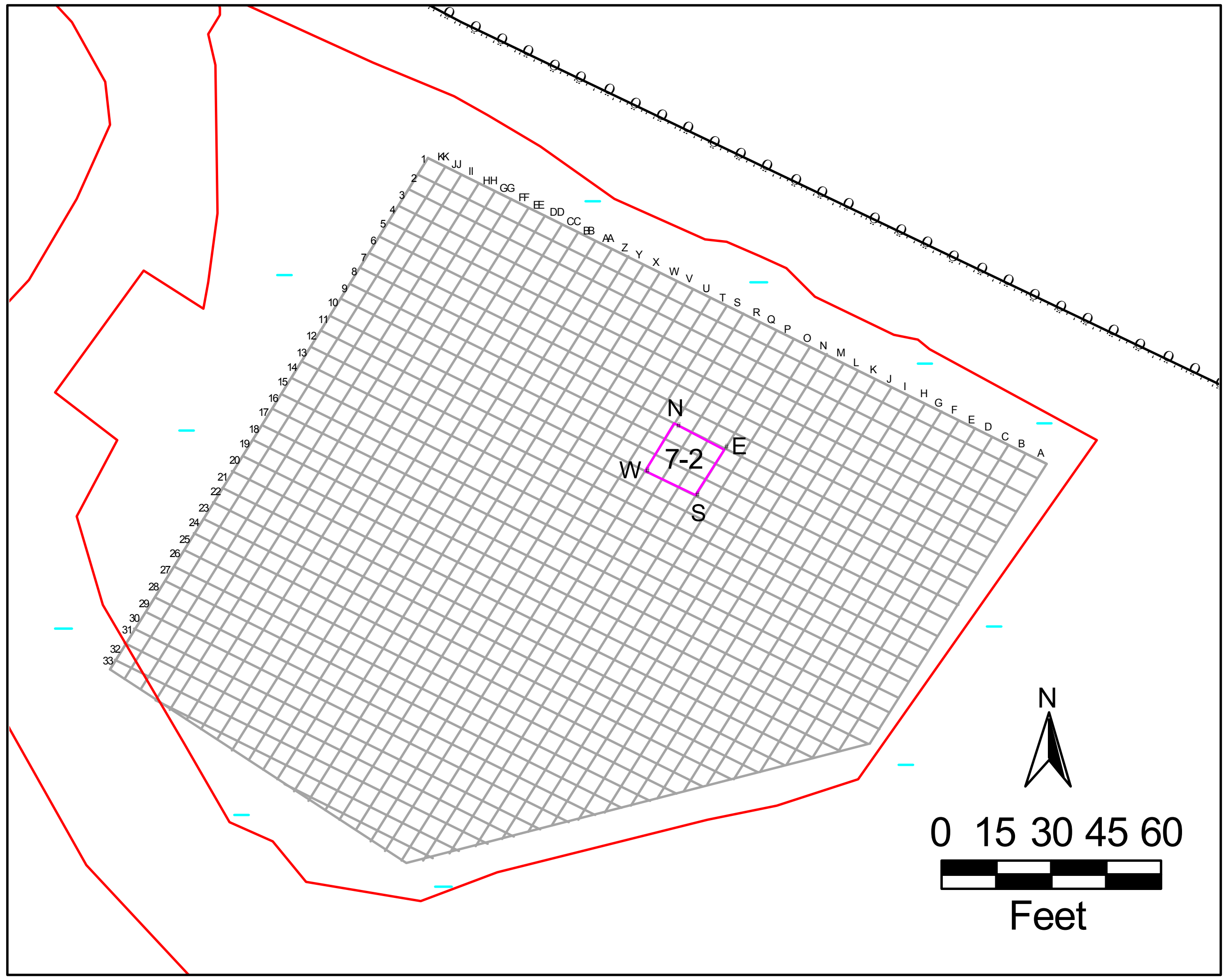
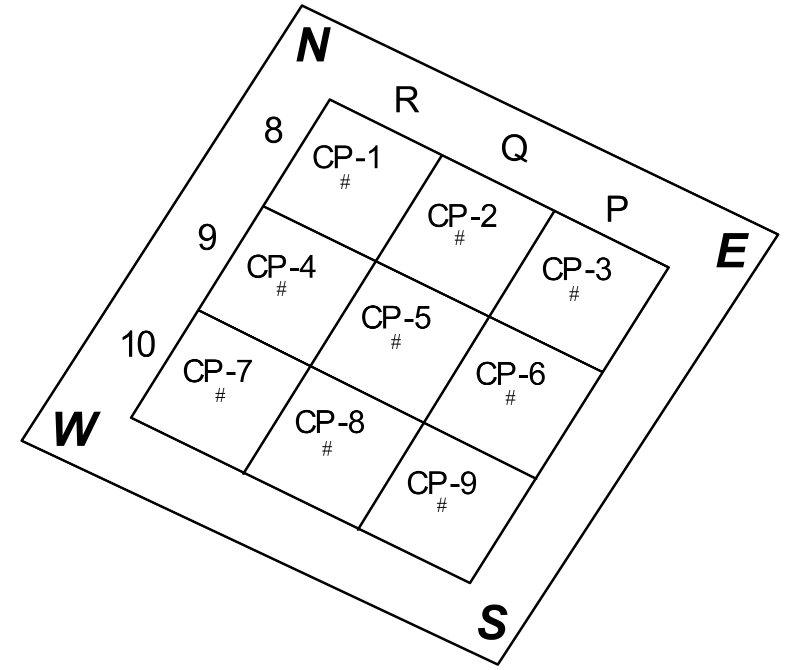
Figure 4
Pilot Plant Demonstration
Soil Acquisition
Slug Locations -- Slug/Batch 7-1

Contract Number: DACW41-99-D-9001
Delivery Order Number: ______
Project Number:
Drawing Number: PPDR-4

Date Processed: 10-11-00
Beginning Elevation: 57' Above MSL
Slug/Batch Depth - 2'





Point I. D.	Coordinates	
	Northing	Easting
N	752 730.89	2164 676.94
E	752 724.21	2164 690.46
S	752 711.43	2164 682.46
W	752 718.11	2164 668.94

Point Number	Grid I. D.	Coordinates	
		Northing	Easting
CP-1	R - 8	752 727.65	2164 677.86
CP-2	Q - 8	752 725.44	2164 682.37
CP-3	P - 8	752 723.23	2164 686.88
CP-4	R - 9	752 723.39	2164 675.19
CP-5	Q - 9	752 721.18	2164 679.70
CP-6	P - 9	752 718.97	2164 684.21
CP-7	R - 10	752 719.13	2164 672.52
CP-8	Q - 10	752 716.92	2164 677.03
CP-9	P - 10	752 714.71	2164 681.54

Slug 7-2
Radioactive Materials Area Boundary
Perimeter Fenceline
Center Point of Grid Square (CP)

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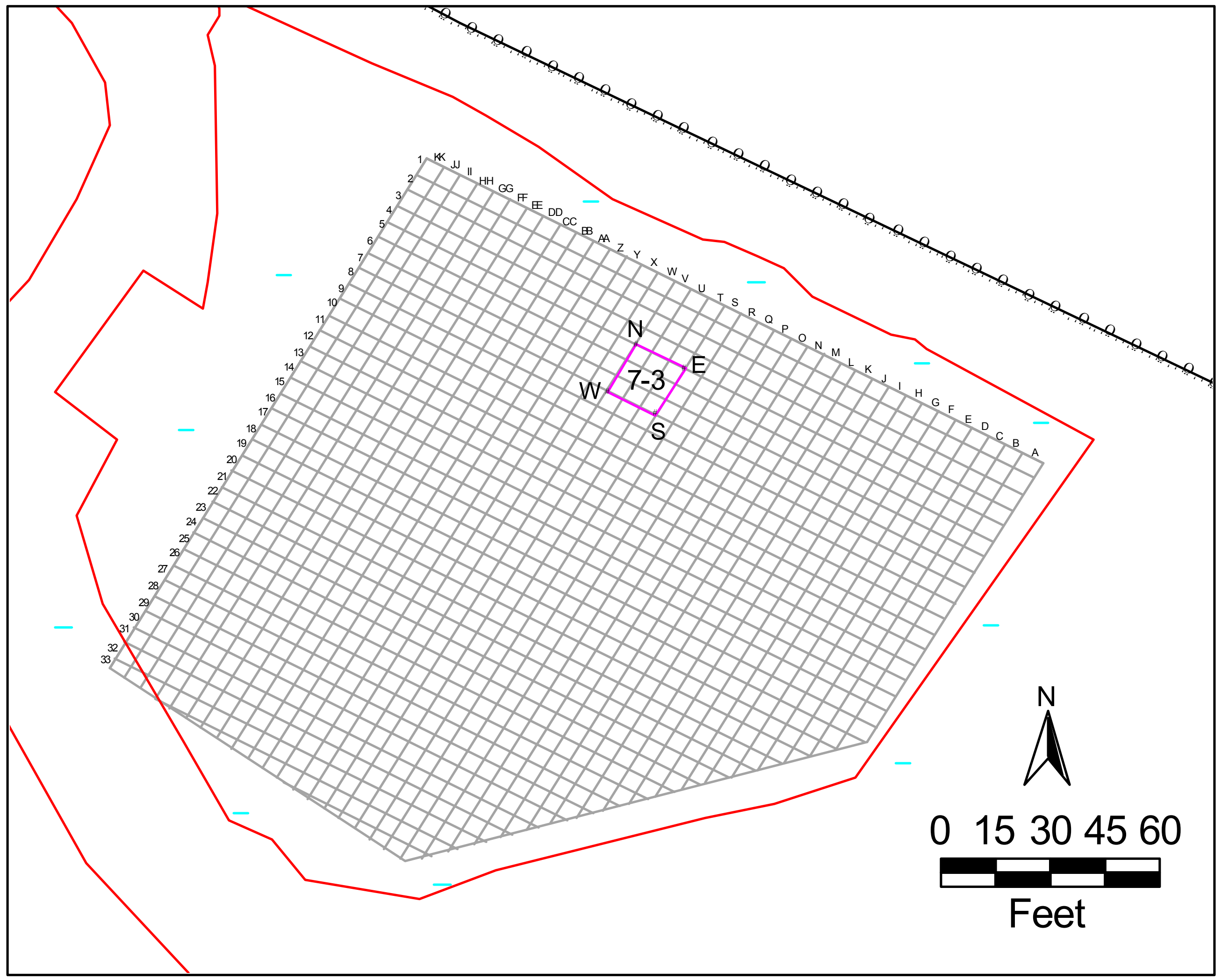
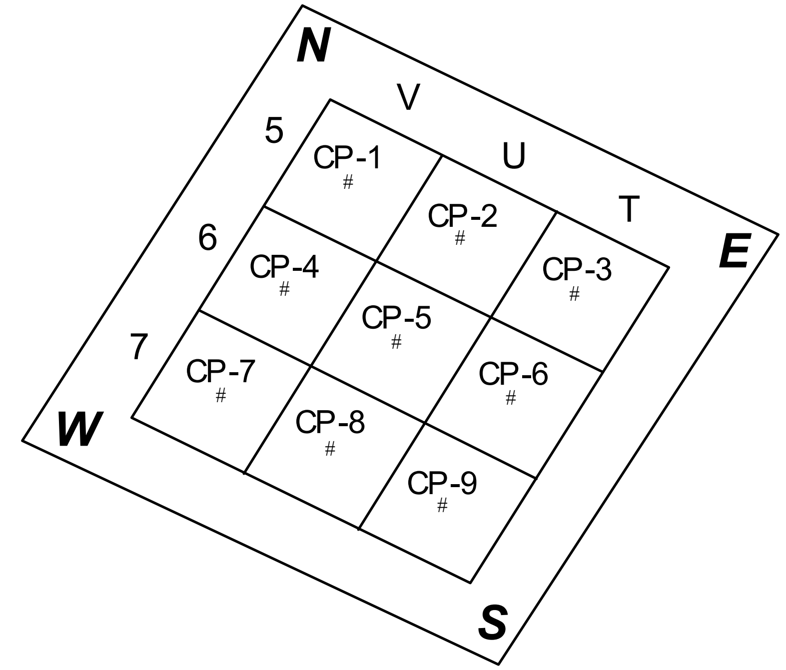
Figure 5
Pilot Plant Demonstration
Soil Acquisition
Slug Locations -- Slug/Batch 7-2

Contract Number: DACW41-99-D-9001
Delivery Order Number: ------
Project Number:
Drawing Number: PPDR-5

Date Processed: 10-17-00
Beginning Elevation: 60' Above MSL
Slug/Batch Depth - 3'



Point I. D.	Coordinates	
	Northing	Easting
N	752 752.57	2164 666.92
E	752 745.89	2164 680.43
S	752 733.12	2164 672.43
W	752 739.79	2164 658.92



Point Number	Grid I. D.	Coordinates	
		Northing	Easting
CP-1	V - 5	752 749.33	2164 667.84
CP-2	U - 5	752 747.12	2164 672.35
CP-3	T - 5	752 744.91	2164 676.86
CP-4	V - 6	752 745.07	2164 665.17
CP-5	U - 6	752 742.86	2164 669.68
CP-6	T - 6	752 740.65	2164 674.19
CP-7	V - 7	752 740.81	2164 662.50
CP-8	U - 7	752 738.60	2164 667.01
CP-9	T - 7	752 736.39	2164 671.52

Slug 7-3
Radioactive Materials Area Boundary
Perimeter Fenceline
Center Point of Grid Square (CP)

Originating File:
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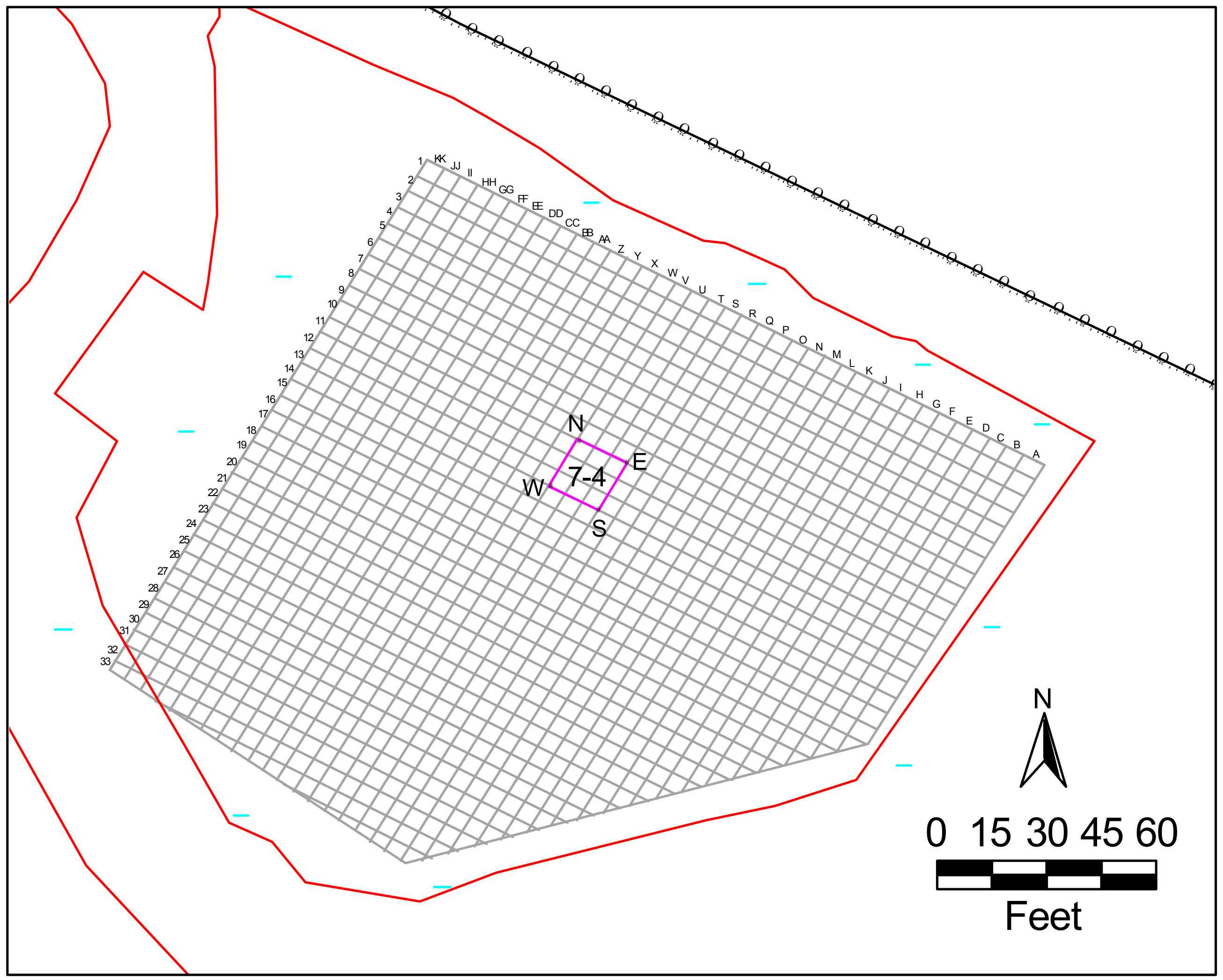
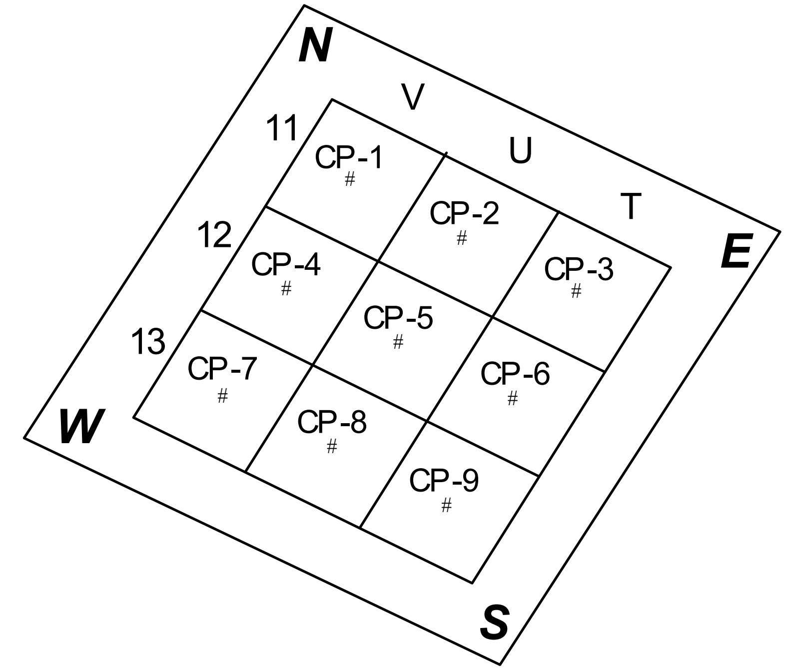
MAYWOOD, NEW JERSEY
Figure 6
Pilot Plant Demonstration
Soil Acquisition
Slug Locations -- Slug/Batch 7-3

Contract Number: DACW41-99-D-9001
Delivery Order Number:
Project Number:
Drawing Number: PPDR-6

Date Processed: 10-19-00
Beginning Elevation: 60' Above MSL
Slug/Batch Depth - 3'



Point I. D.	Coordinates	
	Northing	Easting
N	752 727.01	2164 650.92
E	752 720.34	2164 664.44
S	752 707.56	2164 656.44
W	752 714.24	2164 642.92



Point Number	Grid I. D.	Coordinates	
		Northing	Easting
CP-1	V - 11	752 723.77	2164 651.84
CP-2	U - 11	752 721.56	2164 656.35
CP-3	T - 11	752 719.35	2164 660.86
CP-4	V - 12	752 719.51	2164 649.17
CP-5	U - 12	752 717.30	2164 653.68
CP-6	T - 12	752 715.09	2164 658.19
CP-7	V - 13	752 715.25	2164 646.50
CP-8	U - 13	752 713.04	2164 651.01
CP-9	T - 13	752 710.83	2164 655.52

Legend:
- Slug 7-4
- Radioactive Materials Area Boundary
- Perimeter Fenceline
- # Center Point of Grid Square (CP)

Originating File:
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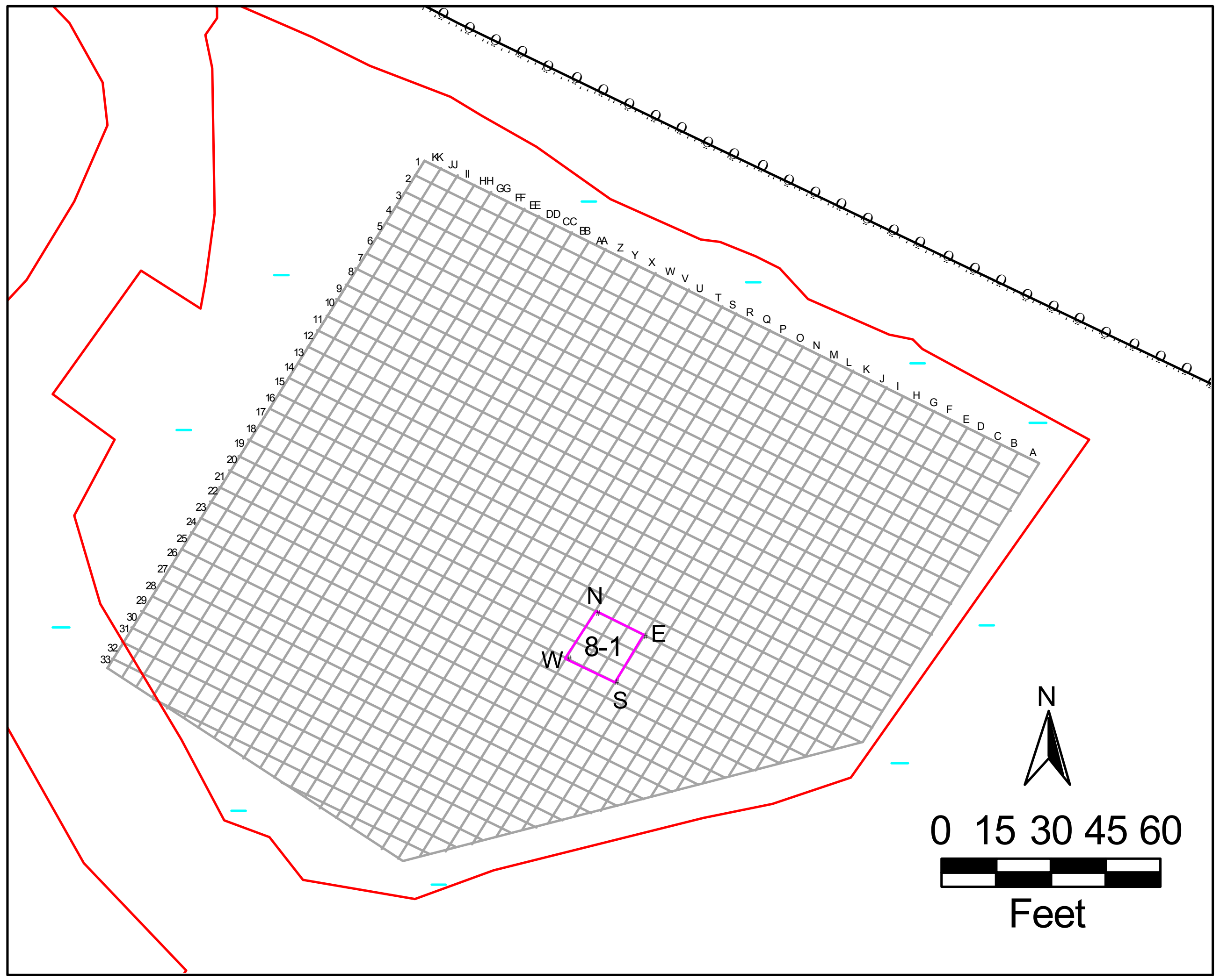
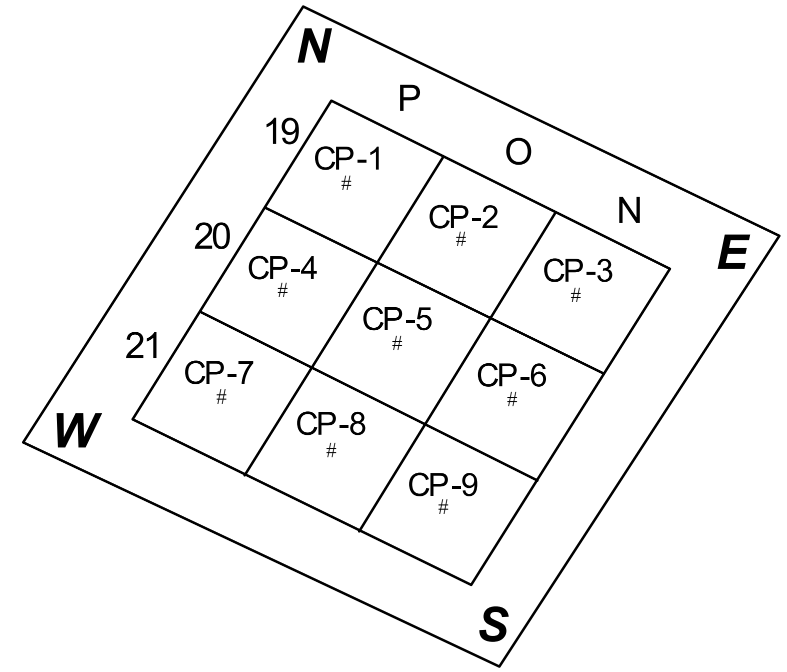
Figure 7
Pilot Plant Demonstration
Soil Acquisition
Slug Locations -- Slug/Batch 7-4

Contract Number: DACW41-99-D-9001
Delivery Order Number: ________
Project Number:
Drawing Number: PPDR-7

Date Processed: 9-7-00
Beginning Elevation: 60' Above MSL
Slug/Batch Depth - 1'





Point Number	Grid I. D.	Coordinates	
		Northing	Easting
CP-1	P - 19	752 676.34	2164 657.54
CP-2	O - 19	752 674.13	2164 662.05
CP-3	N - 19	752 671.92	2164 666.56
CP-4	P - 20	752 672.08	2164 654.87
CP-5	O - 20	752 669.87	2164 659.38
CP-6	N - 20	752 667.66	2164 663.89
CP-7	P - 21	752 667.82	2164 652.20
CP-8	O - 21	752 665.61	2164 656.71
CP-9	N - 21	752 663.40	2164 661.22

Point I. D.	Coordinates	
	Northing	Easting
N	752 679.58	2164 656.62
E	752 672.90	2164 670.14
S	752 660.12	2164 662.14
W	752 666.80	2164 648.62

Slug 8-1
Radioactive Materials Area Boundary
Perimeter Fenceline
Center Point of Grid Square (CP)

Originating File:
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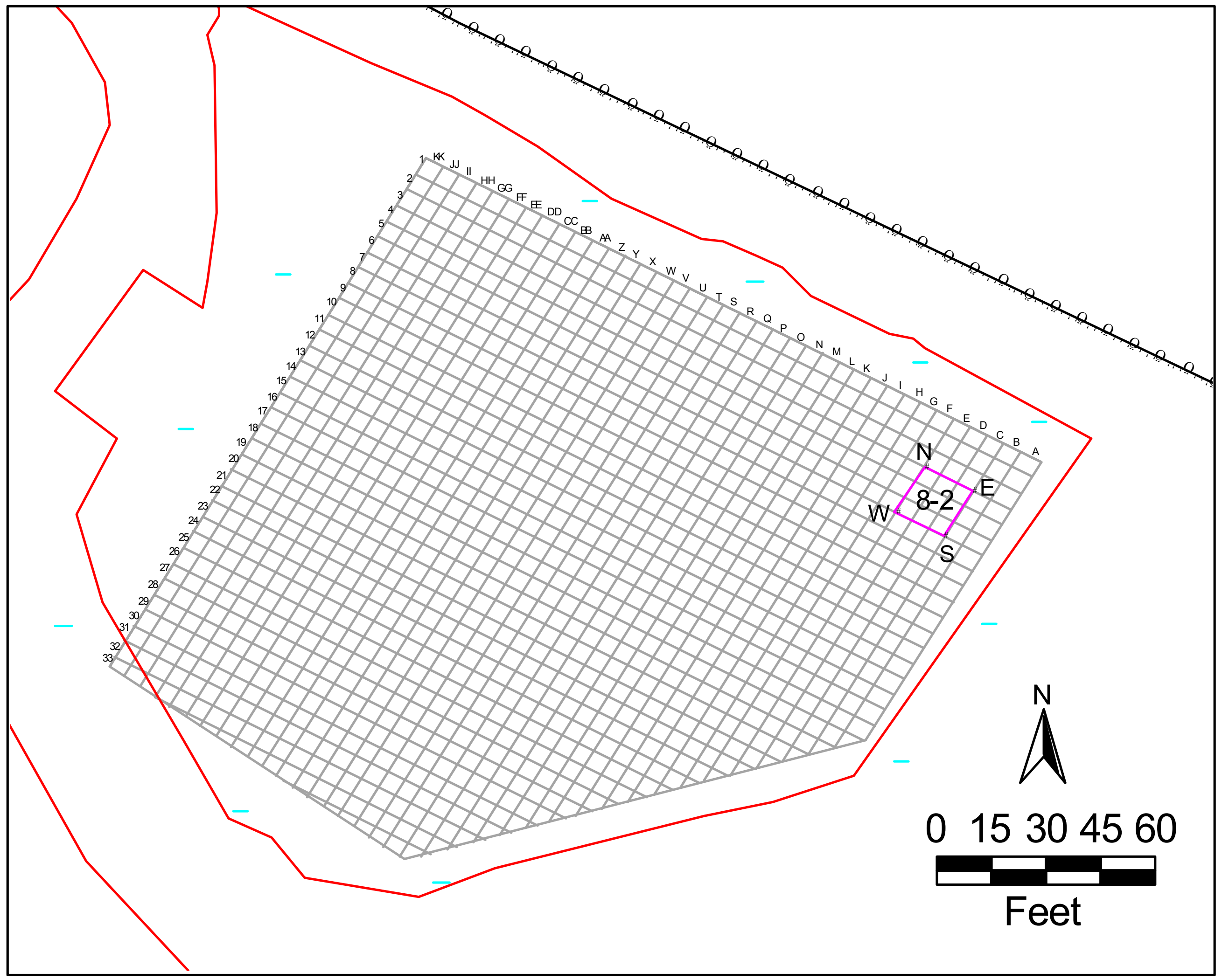
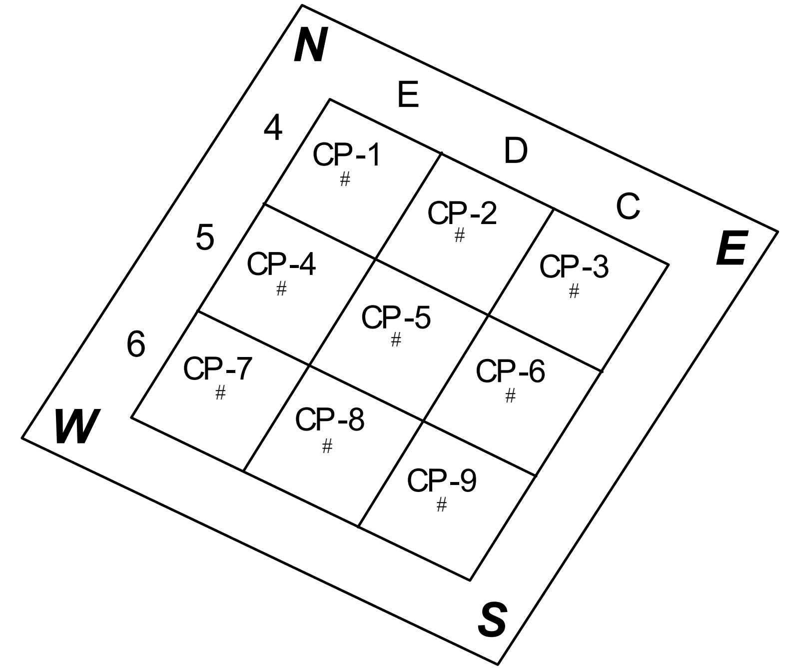
Figure 8
Pilot Plant Demonstration
Soil Acquisition
Slug Locations -- Slug/Batch 8-1

Contract Number: DACW41-99-D-9001
Drawing Number: PPDR-8

Date Processed: 9-13-00
Beginning Elevation: 60' Above MSL
Slug/Batch Depth - 1'





Point Number	Grid I. D.	Coordinates	
		Northing	Easting
CP-1	E - 4	752 715.75	2164 747.09
CP-2	D - 4	752 713.54	2164 751.60
CP-3	C - 4	752 711.33	2164 756.11
CP-4	E - 5	752 711.49	2164 744.42
CP-5	D - 5	752 709.28	2164 748.93
CP-6	C - 5	752 707.07	2164 753.44
CP-7	E - 6	752 707.23	2164 741.75
CP-8	D - 6	752 705.02	2164 746.26
CP-9	C - 6	752 702.81	2164 750.77

Point I. D.	Coordinates	
	Northing	Easting
N	752 718.99	2164 746.18
E	752 712.31	2164 759.69
S	752 699.54	2164 751.69
W	752 706.21	2164 738.18

Slug 8-2
Radioactive Materials Area Boundary
Perimeter Fenceline
Center Point of Grid Square (CP)

Originating File:
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Reviewed by: M. Mendonca
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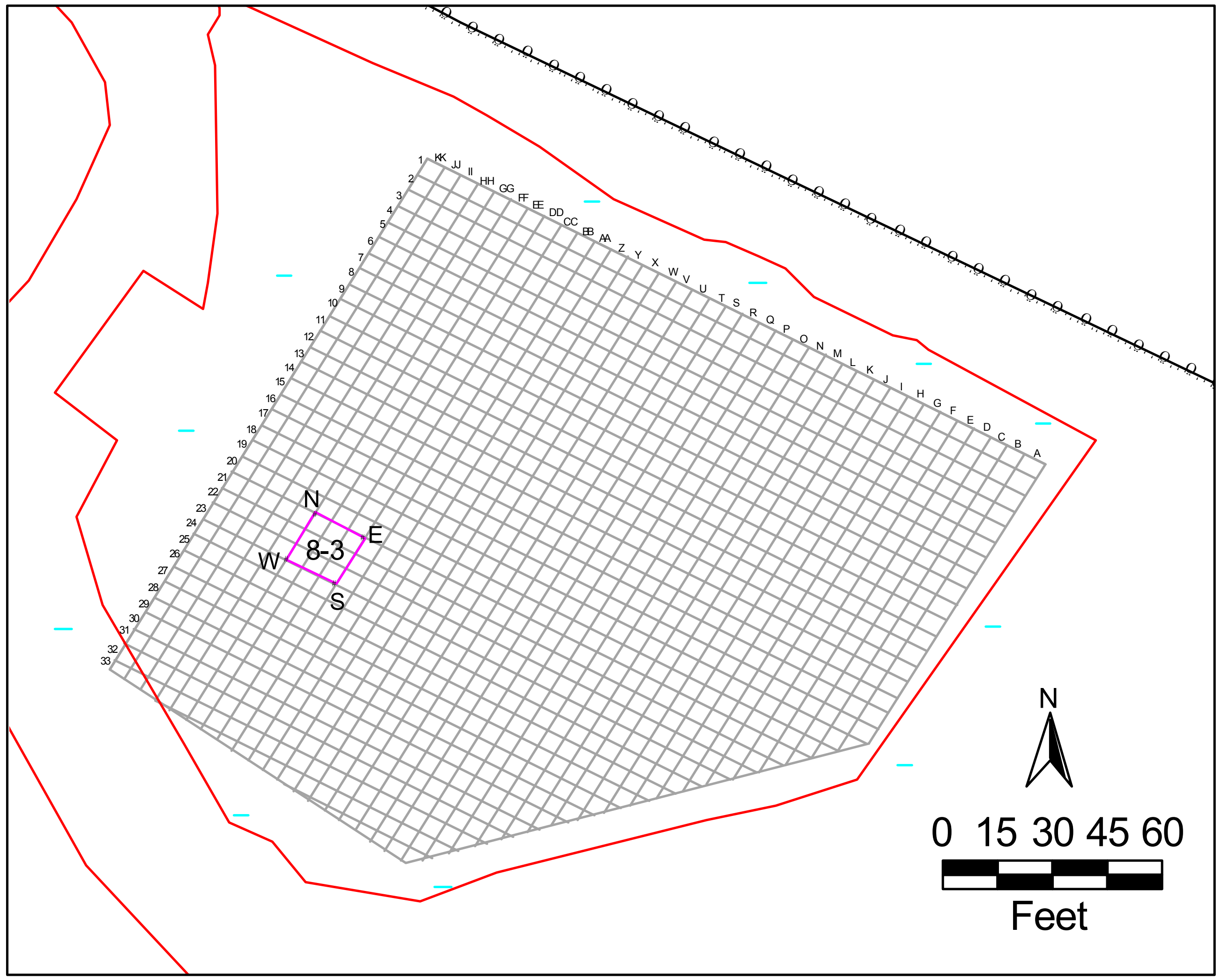
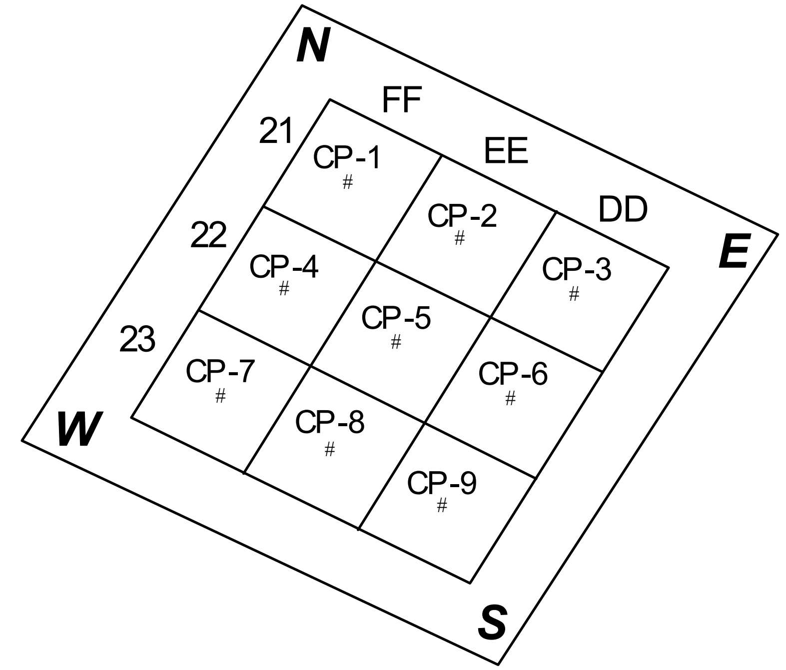
MAYWOOD, NEW JERSEY

Figure 9
Pilot Plant Demonstration
Soil Acquisition
Slug Locations -- Slug/Batch 8-2

Contract Number: DACW41-99-D-9001
Delivery Order Number:
Project Number:
Drawing Number: PPDR-9

Date Processed: 10-4-00
Beginning Elevation: 62' Above MSL
Slug/Batch Depth - 2'





Point Number	Grid I. D.	Coordinates	
		Northing	Easting
CP-1	FF - 21	752 703.43	2164 580.12
CP-2	EE - 21	752 701.22	2164 584.63
CP-3	DD - 21	752 699.01	2164 589.14
CP-4	FF - 22	752 699.17	2164 577.45
CP-5	EE - 22	752 696.96	2164 581.96
CP-6	DD - 22	752 694.75	2164 586.47
CP-7	FF - 23	752 694.91	2164 574.78
CP-8	EE - 23	752 692.70	2164 579.29
CP-9	DD - 23	752 690.49	2164 583.80

Point I. D.	Coordinates	
	Northing	Easting
N	752 706.68	2164 579.20
E	752 700.00	2164 592.72
S	752 687.22	2164 584.72
W	752 693.90	2164 571.20

Slug 8-3
Radioactive Materials Area Boundary
Perimeter Fenceline
Center Point of Grid Square (CP)

Originating File:
X:\GPS-Maywood\Projects\Pilot Demo\PD Slug Coordinates.apr

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Date: 1-25-01
Approved: R. Skryness
Date:
Reviewed by: M. Mendonca
Date:
File Name: X:\GPS-Maywood\Pilot Support Documentation\Slug Coordinates.ppt

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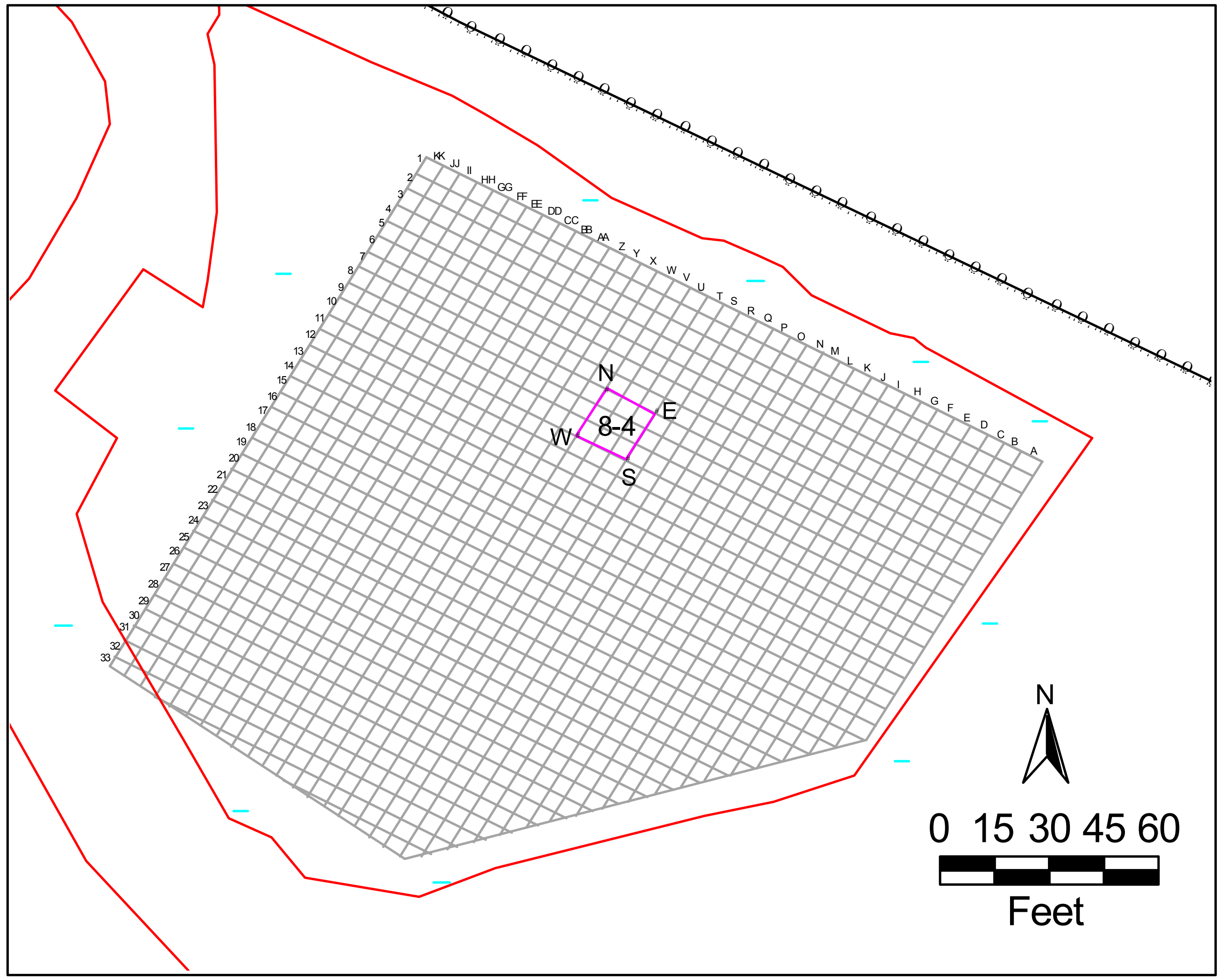
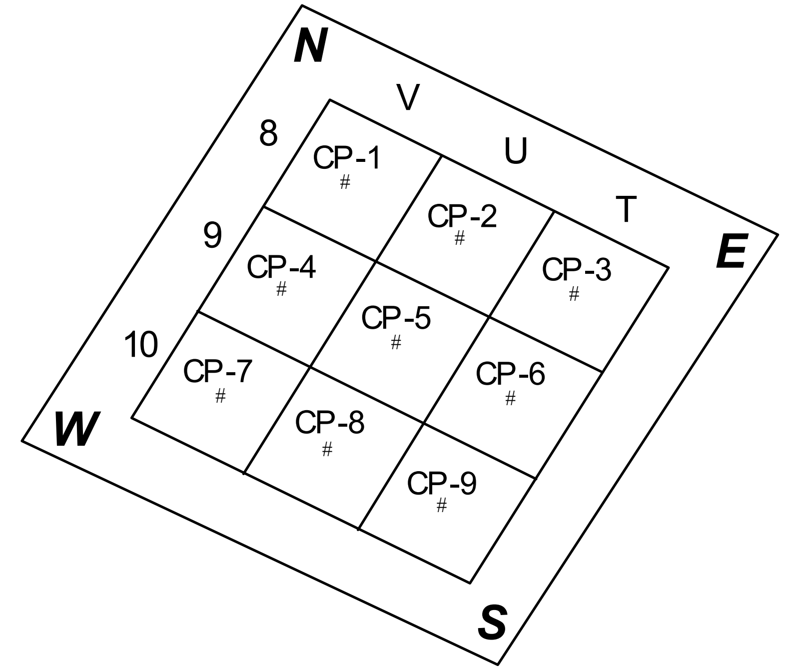
MAYWOOD, NEW JERSEY

Figure 10
Pilot Plant Demonstration
Soil Acquisition
Slug Locations -- Slug/Batch 8-3

Contract Number: DACW41-99-D-9001
Delivery Order Number:
Project Number:
Drawing Number: PPDR-10

Date Processed: 10-18-00
Beginning Elevation: 60' Above MSL
Slug/Batch Depth - 3'





Point Number	Grid I. D.	Coordinates	
		Northing	Easting
CP-1	V - 8	752 736.56	2164 659.84
CP-2	U - 8	752 734.35	2164 664.35
CP-3	T - 8	752 732.14	2164 668.86
CP-4	V - 9	752 732.30	2164 657.17
CP-5	U - 9	752 730.09	2164 661.68
CP-6	T - 9	752 727.88	2164 666.19
CP-7	V - 10	752 728.04	2164 654.50
CP-8	U - 10	752 725.83	2164 659.01
CP-9	V - 10	752 723.62	2164 663.52

Point I. D.	Coordinates	
	Northing	Easting
N	752 739.79	2164 658.92
E	752 733.12	2164 672.44
S	752 720.34	2164 664.44
W	752 727.01	2164 650.92

Slug 8-4
Radioactive Materials Area Boundary
Perimeter Fenceline
\# Center Point of Grid Square (CP)

Originating File:
X:\GPS-Maywood\Projects\Pilot Demo\PD Slug Coordinates.apr

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Date:
Reviewed by: M. Mendonca
Date:
File Name: X:\GPS-Maywood\Pilot Support Documentation\Slug Coordinates.ppt

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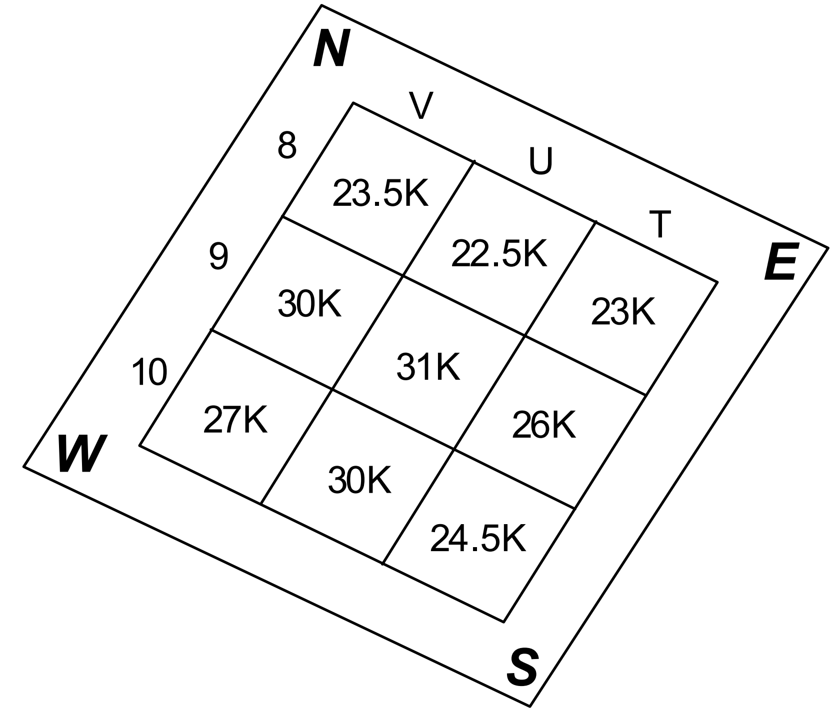
Figure 11
Pilot Plant Demonstration
Soil Acquisition
Slug Locations -- Slug/Batch 8-4

Contract Number: DACW41-99-D-9001
Delivery Order Number:
Project Number:
Drawing Number: PPDR-11

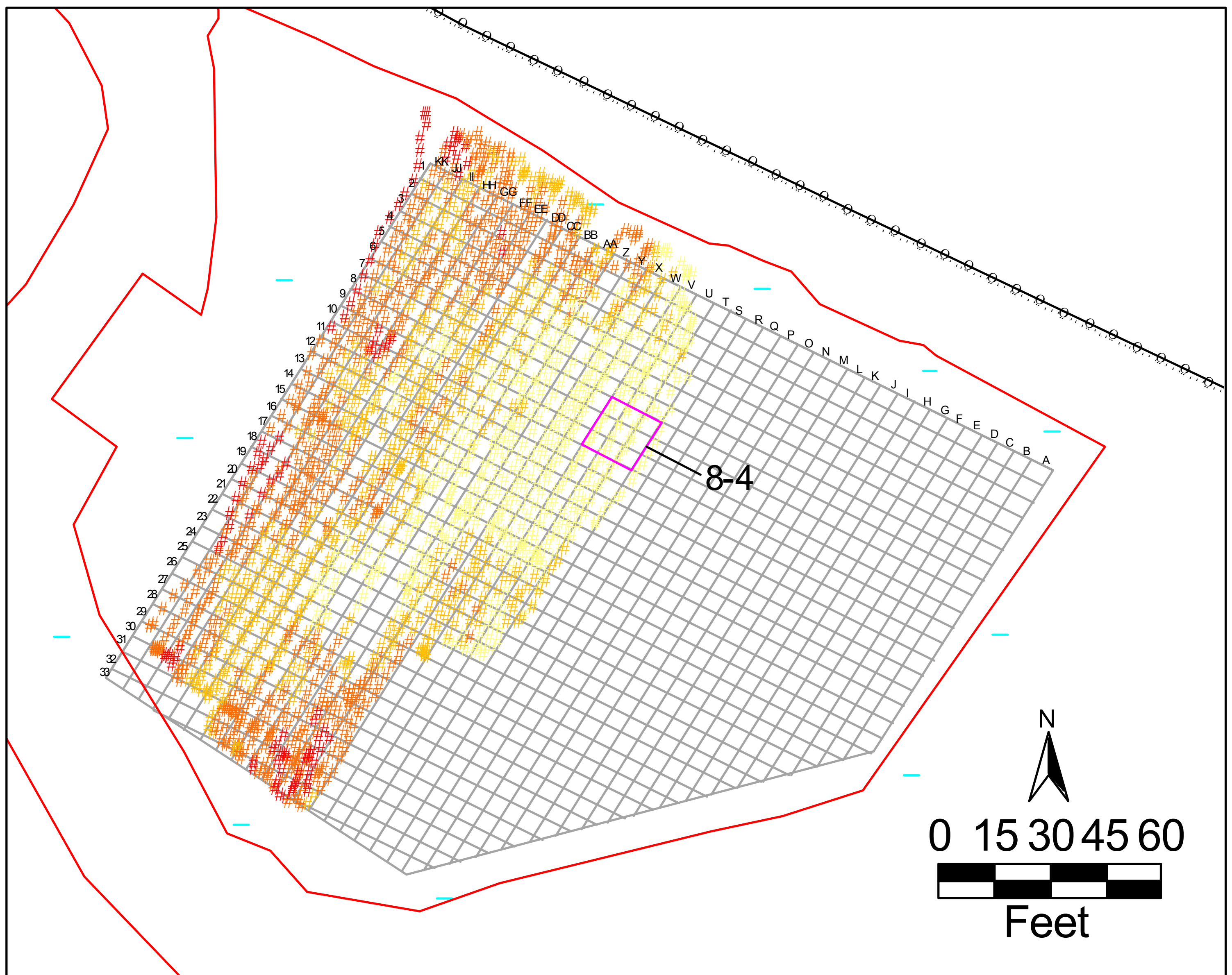
Date Processed: 10-18-00
Beginning Elevation: 60' Above MSL
Slug Depth: 3'



K = 1,000 counts per minute

CPM

9400 - 20000
20001 - 40000
40001 - 60000
60001 - 100000
100001 - 300000
300001 - 500000
500001 - 999960



Slug 8-4
Radioactive Materials Area Boundary
Perimeter Fenceline

Originating File:
X:\GPS-Maywood\Projects\Pilot Demo\PD Slug Coordinates.apr

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Approved: R. Skryness
Reviewed by: M. Mendonca
File Name: X:\GPS-Maywood\Pilot Support Documentation\Slug Coordinates.ppt

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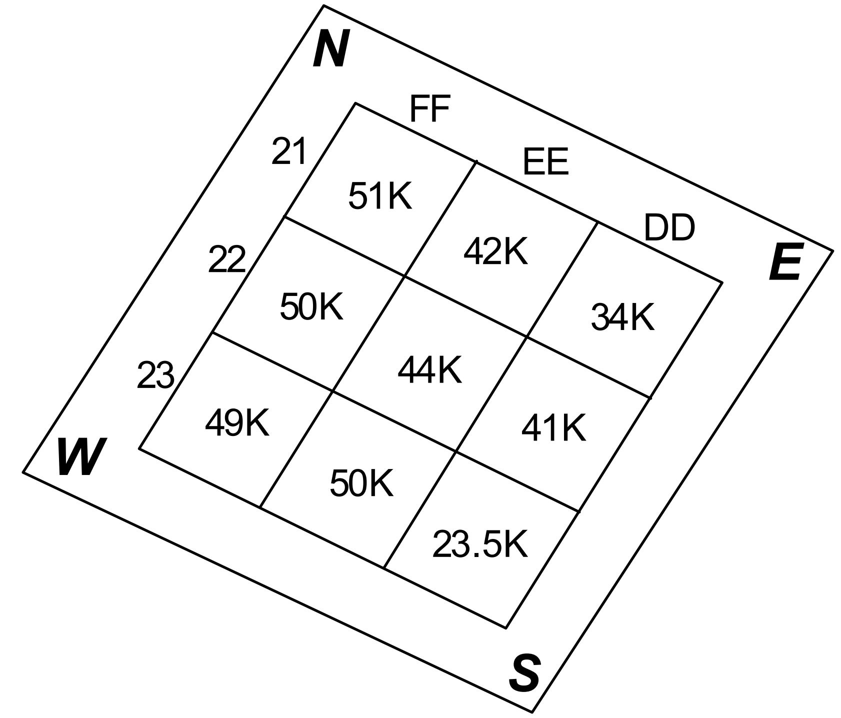
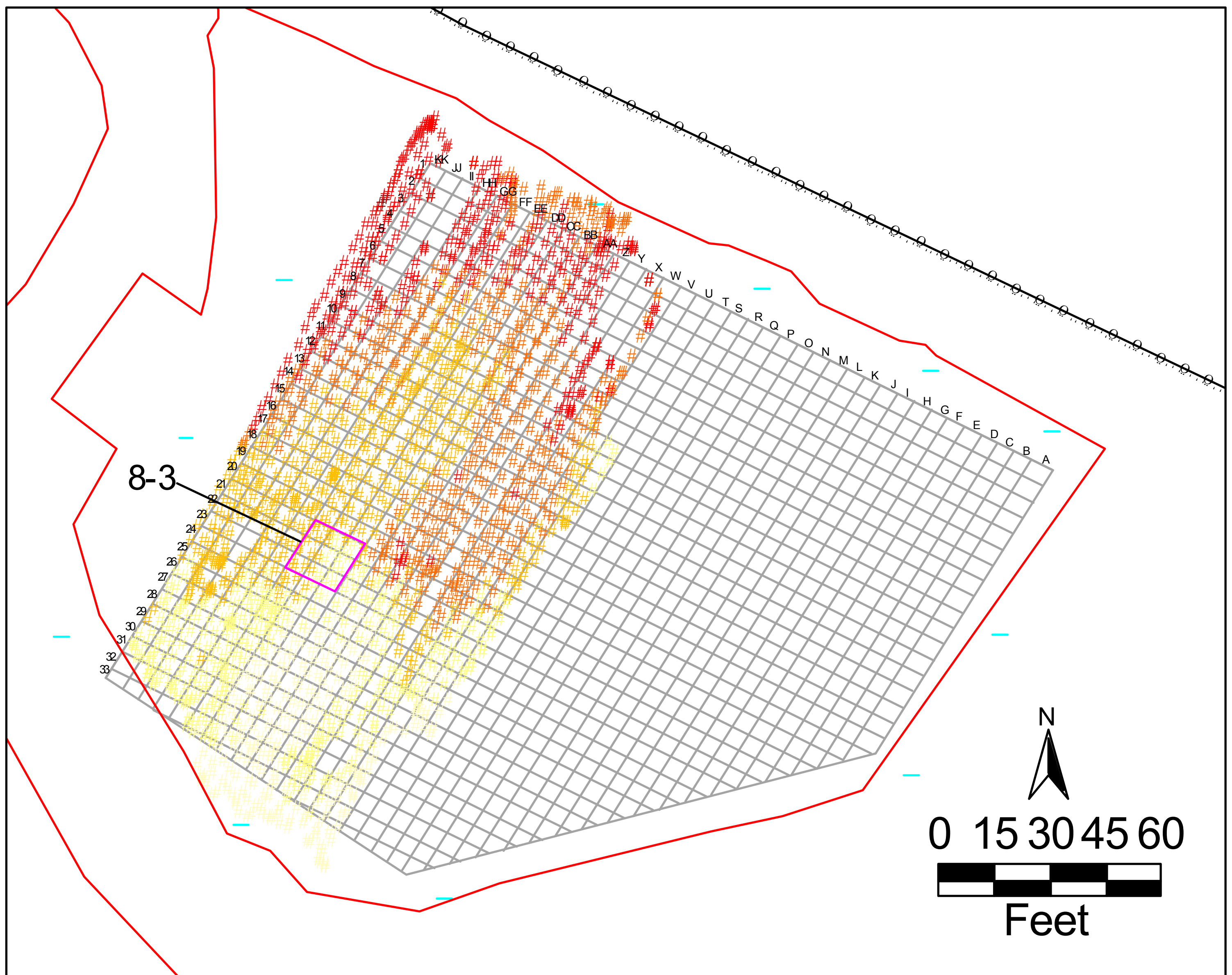
MAYWOOD, NEW JERSEY
Figure 34
Pilot Plant Demonstration
Soil Acquisition
Slug Surveys -- Slug/Batch 8-4

Contract Number: DACW41-99-D-9001
Delivery Order Number:
Project Number:
Drawing Number: PPDR-34

Date Processed: 10-4-00
Beginning Elevation: 62' Above MSL
Slug Depth: 2'



K = 1,000 counts per minute



CPM

- 9400 - 20000
- 20001 - 40000
- 40001 - 60000
- 60001 - 100000
- 100001 - 300000
- 300001 - 500000
- 500001 - 999960

Slug 8-3
Radioactive Materials Area Boundary
Perimeter Fenceline

Originating File:
X:\GPS-Maywood\Projects\Pilot Demo\PD Slug Coordinates.apr

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Reviewed by: M. Mendonca
Date:
File Name: X:\GPS-Maywood\Pilot Support Documentation\Slug Coordinates.ppt

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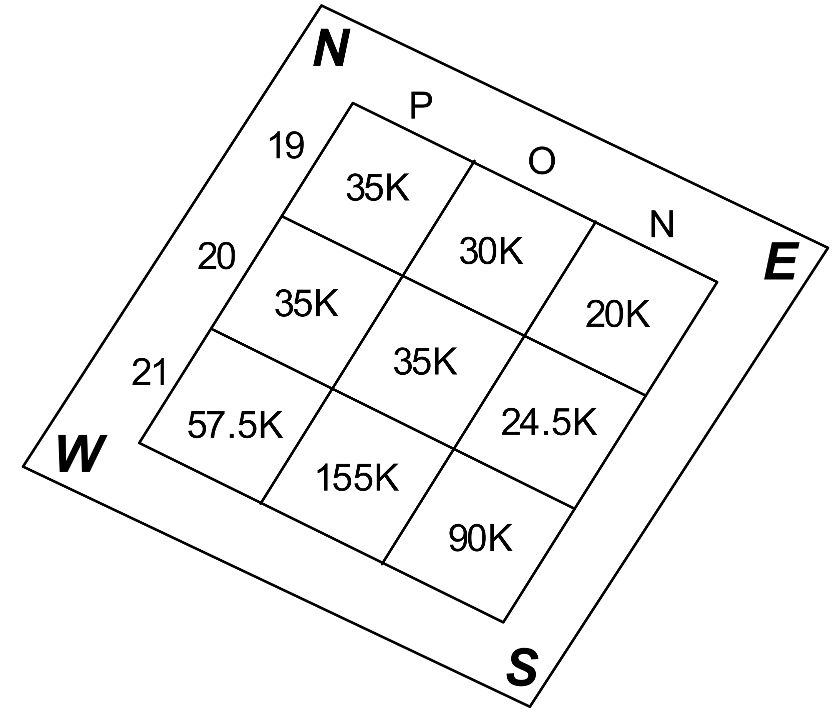
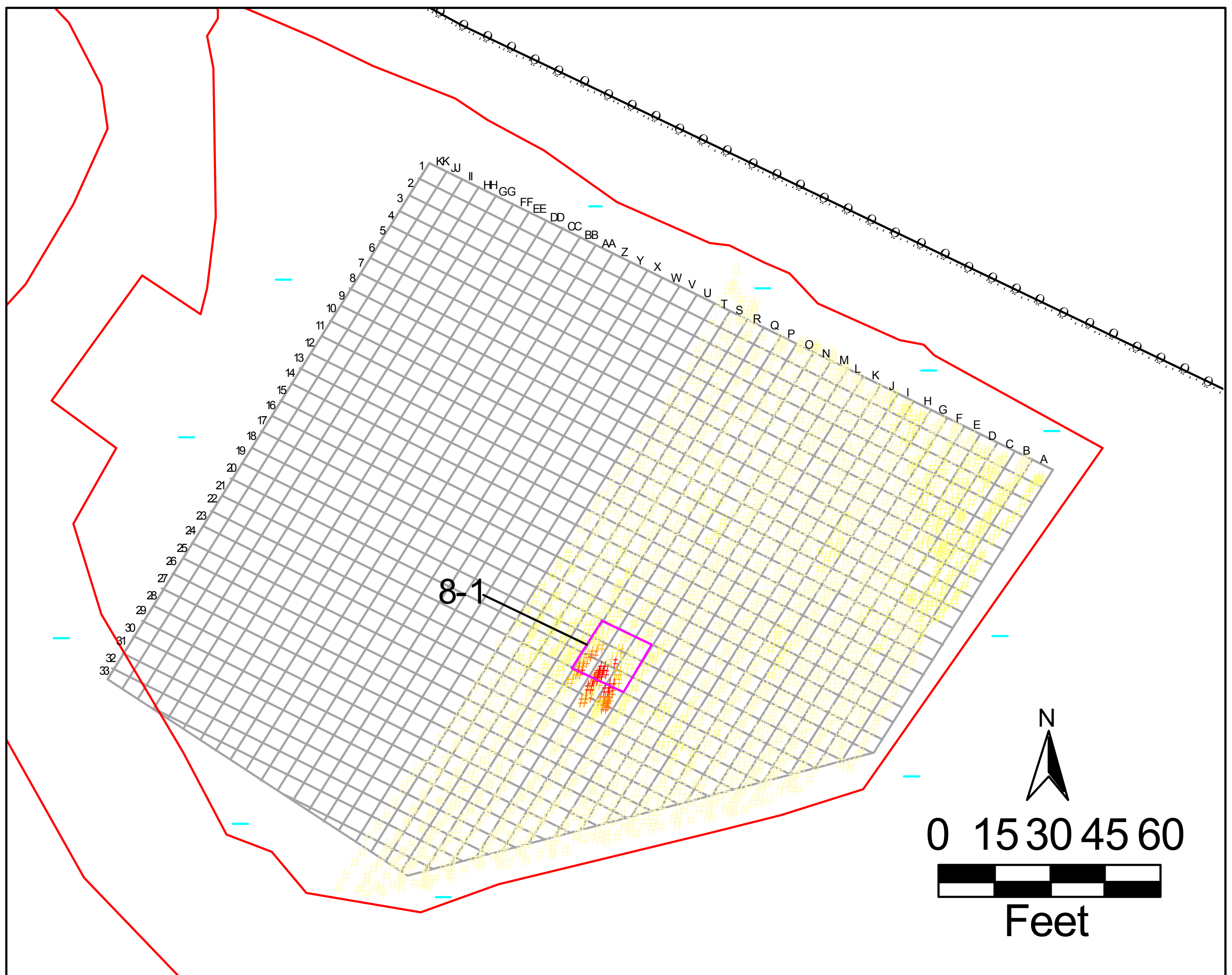
Figure 33
Pilot Plant Demonstration
Soil Acquisition
Slug Surveys -- Slug/Batch 8-3

Contract Number: DACW41-99-D-9001
Delivery Order Number:
Project Number:
Drawing Number: PPDR-33

Date Processed: 9-7-00
Beginning Elevation: 60' Above MSL
Slug Depth: 1'



K = 1,000 counts per minute



CPM
9400 - 20000
20001 - 40000
40001 - 60000
60001 - 100000
100001 - 300000
300001 - 500000
500001 - 999960

Slug 8-1
Radioactive Materials Area Boundary
Perimeter Fenceline

Originating File:
X:\GPS-Maywood\Projects\Pilot Demo\PD Slug Coordinates.apr

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Date:
Approved: R. Skryness
Date: 1-25-01
File Name: X:\GPS-Maywood\Pilot Support Documentation\Slug Coordinates.ppt

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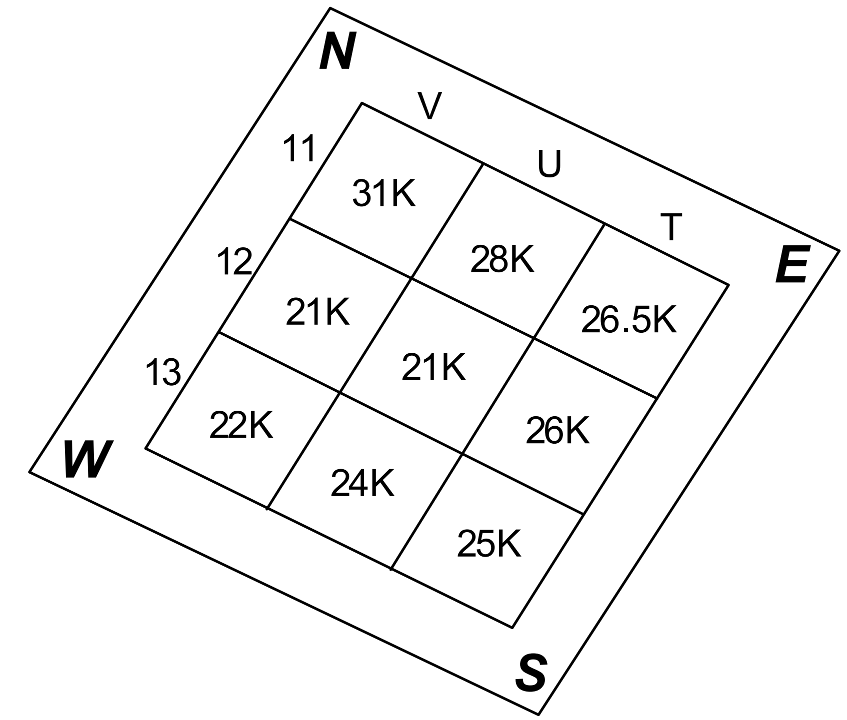
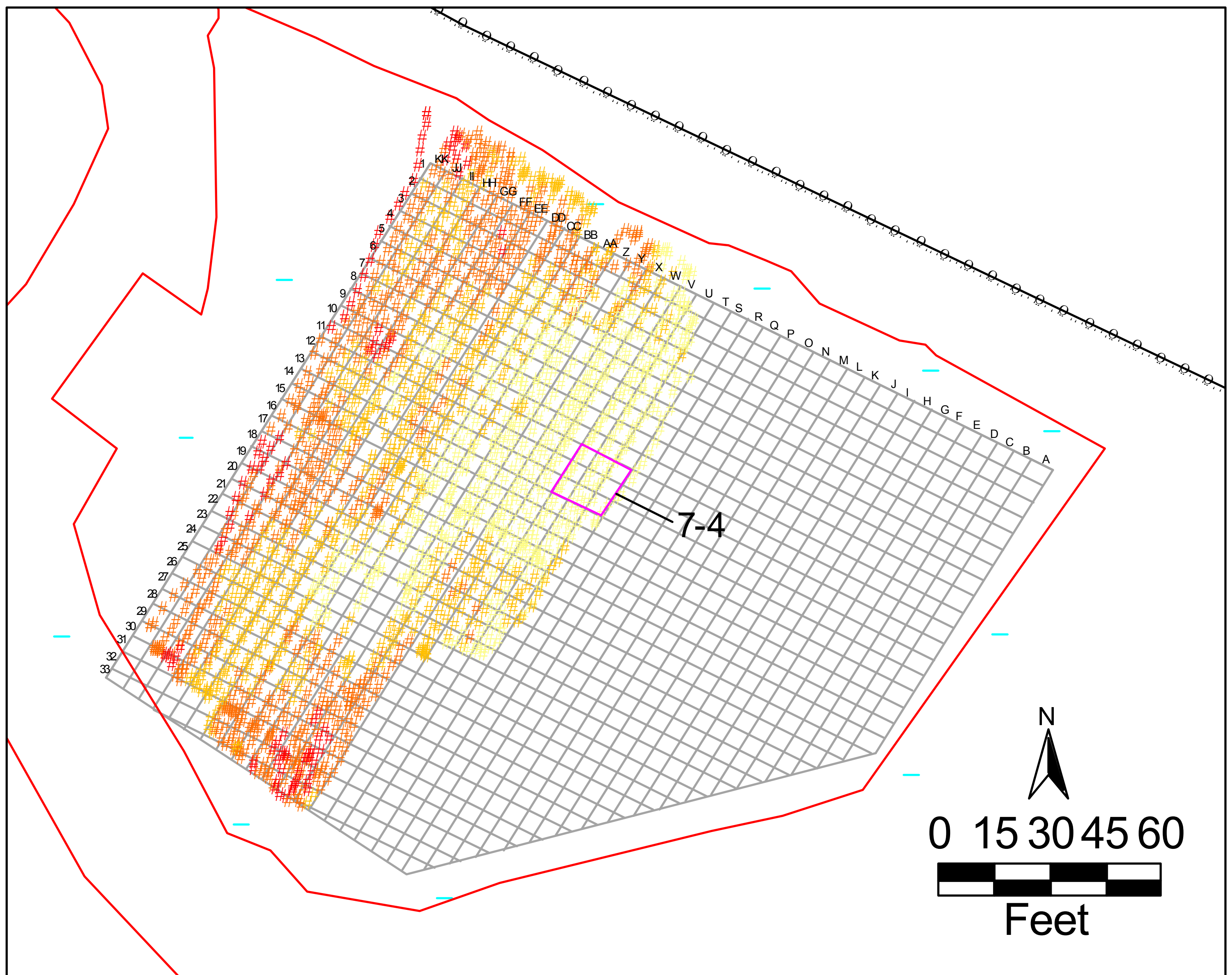
Figure 31
Pilot Plant Demonstration
Soil Acquisition
Slug Surveys -- Slug/Batch 8-1

Contract Number: DACW41-99-D-9001
Delivery Order Number:
Project Number:
Drawing Number: PPDR-31

Date Processed: 10-19-00
Beginning Elevation: 60' Above MSL
Slug Depth: 3'



K = 1,000 counts per minute



CPM
9400 - 20000
20001 - 40000
40001 - 60000
60001 - 100000
100001 - 300000
300001 - 500000
500001 - 999960

Slug 7-4
Radioactive Materials Area Boundary
Perimeter Fenceline

Originating File:
X:\GPS-Maywood\Projects\Pilot Demo\PD Slug Coordinates.apr

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Date:
Reviewed by: M. Mendonca
Date:
File Name: X:\GPS-Maywood\Pilot Support Documentation\Slug Coordinates.ppt

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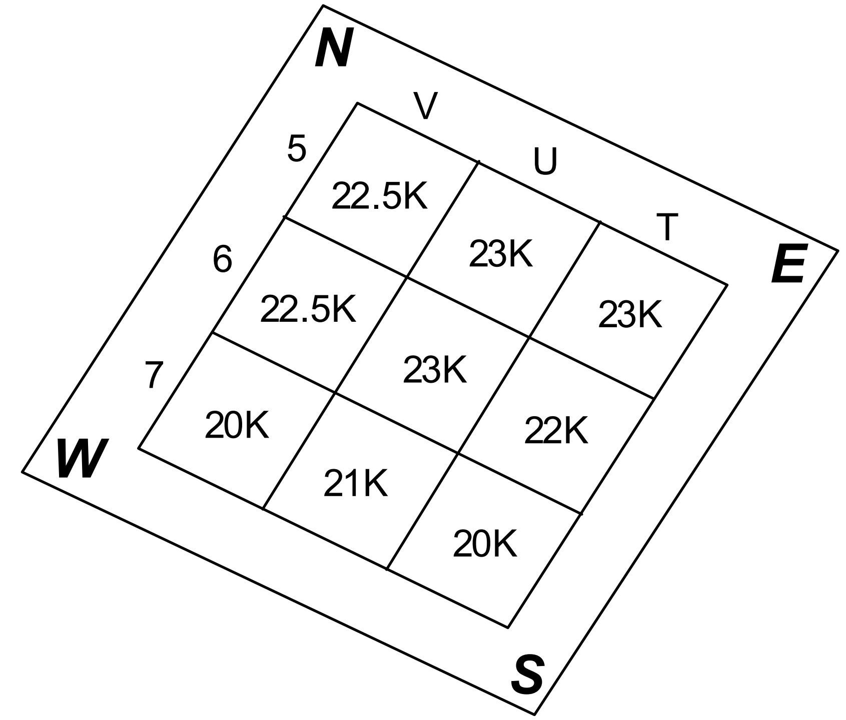
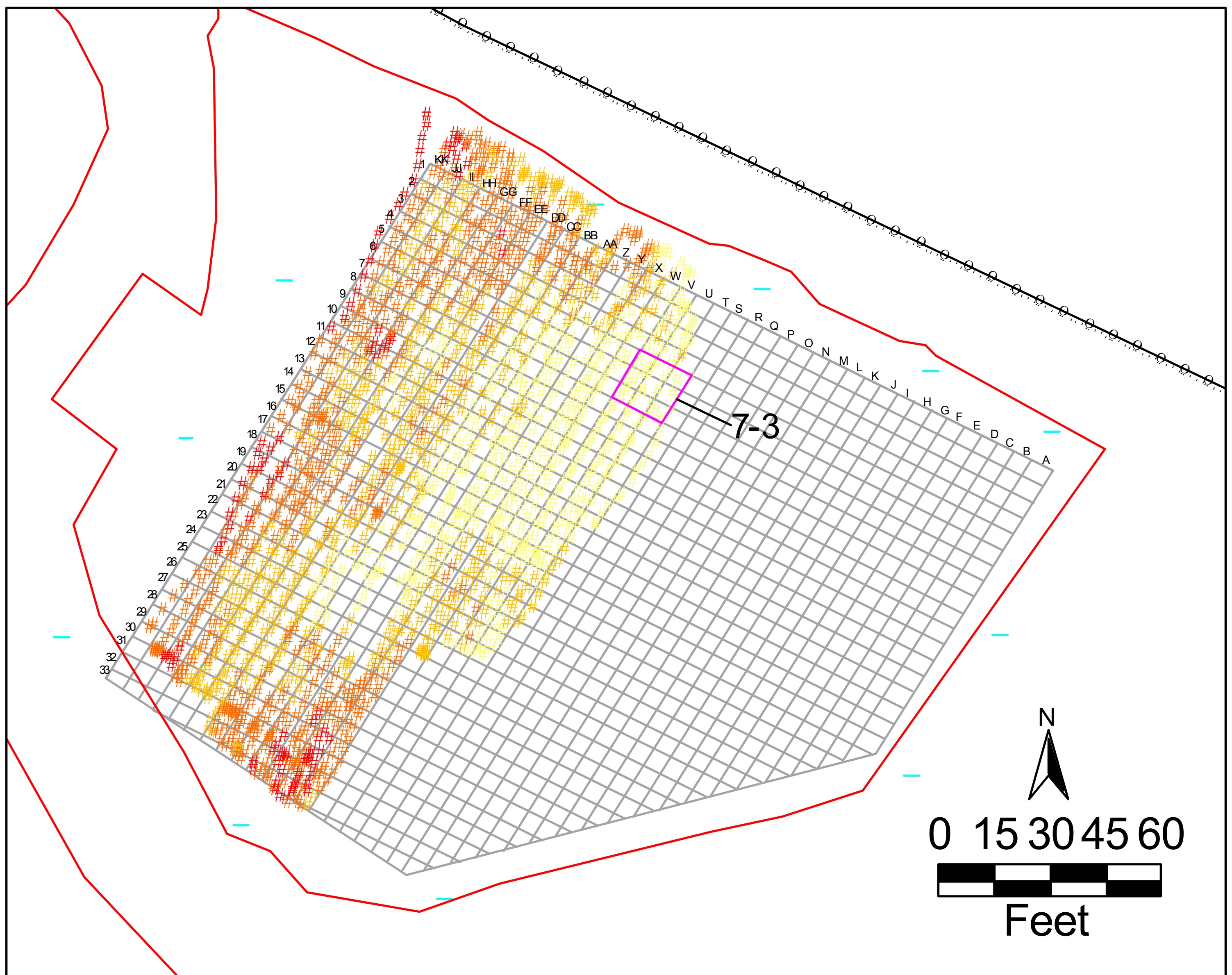
Figure 30
Pilot Plant Demonstration
Soil Acquisition
Slug Surveys -- Slug/Batch 7-4

Contract Number: DACW41-99-D-9001
Delivery Order Number:
Project Number:
Drawing Number: PPDR-30

Date Processed: 10-17-00
Beginning Elevation: 60' Above MSL
Slug Depth: 3'



K = 1,000 counts per minute



CPM
9400 - 20000
20001 - 40000
40001 - 60000
60001 - 100000
100001 - 300000
300001 - 500000
500001 - 999960

Slug 7-3
Radioactive Materials Area Boundary
Perimeter Fenceline

Originating File:
X:\GPS-Maywood\Projects\Pilot Demo\PD Slug Coordinates.apr

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Reviewed by: M. Mendonca
File Name: X:\GPS-Maywood\Pilot Support Documentation\Slug Coordinates.ppt

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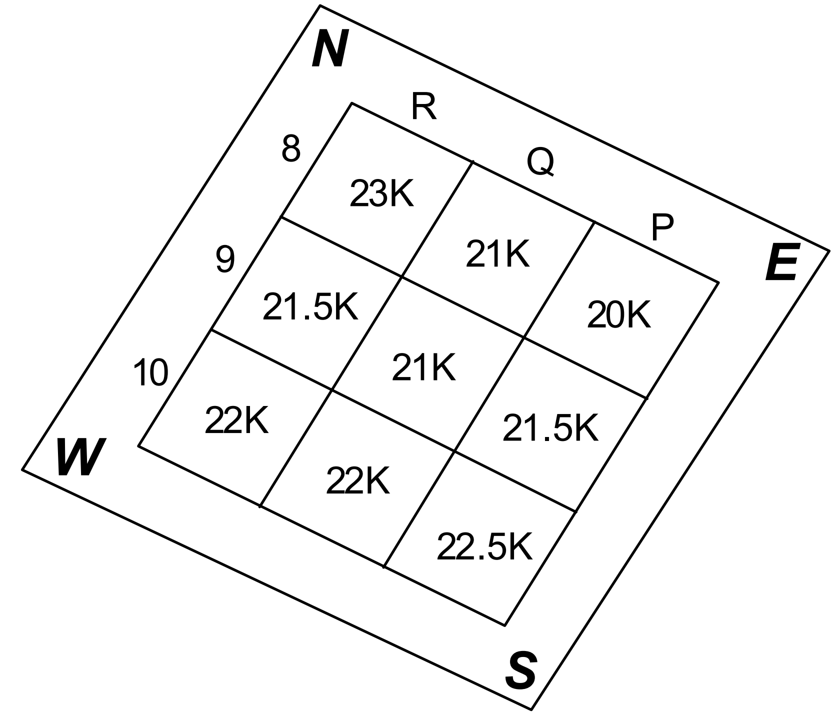
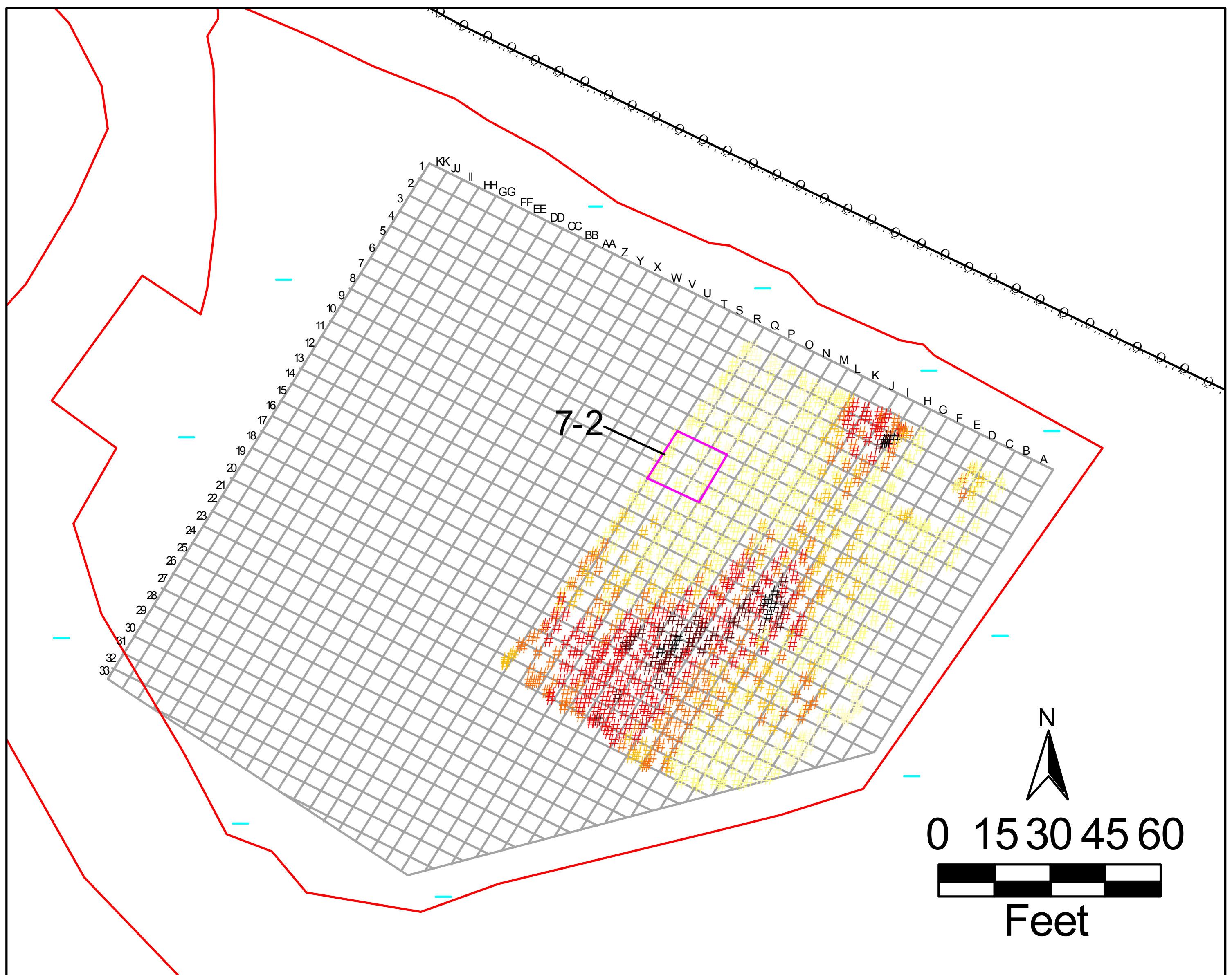
Figure 29
Pilot Plant Demonstration
Soil Acquisition
Slug Surveys -- Slug/Batch 7-3

Contract Number: DACW41-99-D-9001
Delivery Order Number:
Project Number:
Drawing Number: PPDR-29

Date Processed: 10-11-00
Beginning Elevation: 57' Above MSL
Slug Depth: 2'



K = 1,000 counts per minute



CPM
9400 - 20000
20001 - 40000
40001 - 60000
60001 - 100000
100001 - 300000
300001 - 500000
500001 - 999960

Slug 7-2
Radioactive Materials Area Boundary
Perimeter Fenceline

Originating File:
X:\GPS-Maywood\Projects\Pilot Demo\PD Slug Coordinates.apr

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Date:
Reviewed by: M. Mendonca
Date:
File Name: X:\GPS-Maywood\Pilot Support Documentation\Slug Coordinates.ppt

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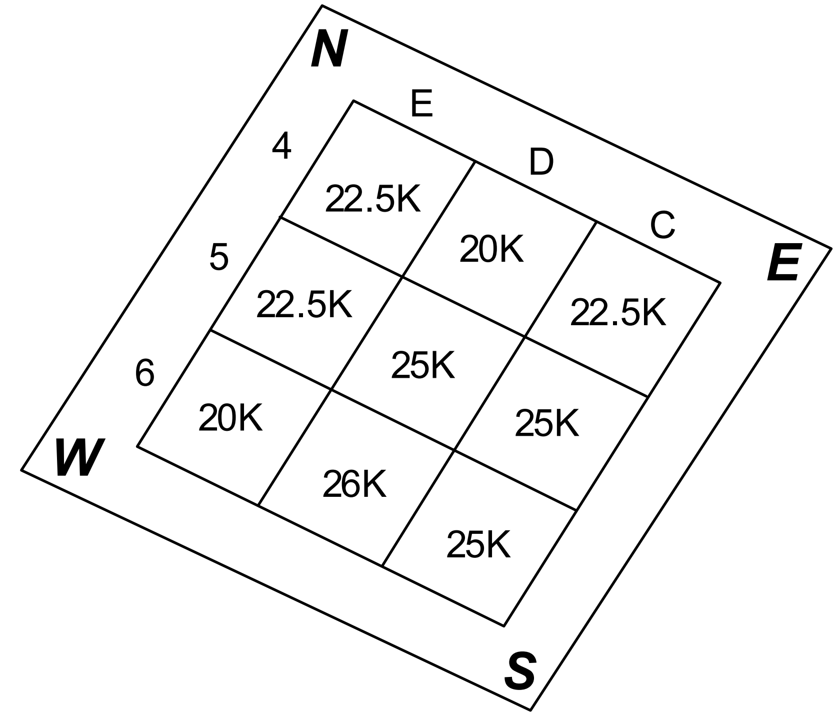
Figure 28

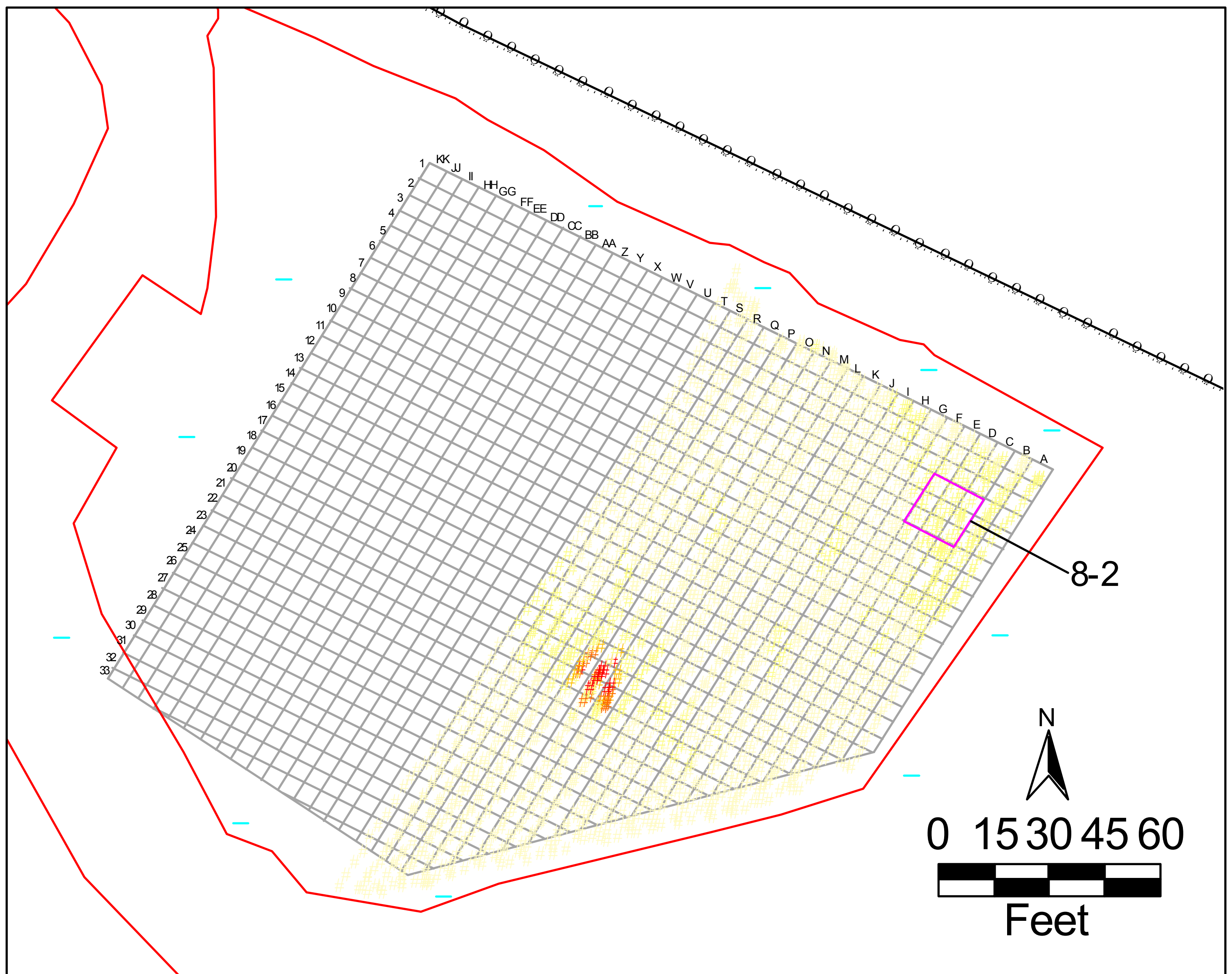
Pilot Plant Demonstration
Soil Acquisition
Slug surveys -- Slug/Batch 7-2

Contract Number: DACW41-99-D-9001
Delivery Order Number:
Project Number:
Drawing Number: PPDR-28

Date Processed: 9-13-00
Beginning Elevation: 60' Above MSL
Slug Depth: 1'



K = 1,000 counts per minute



CPM
9400 - 20000
20001 - 40000
40001 - 60000
60001 - 100000
100001 - 300000
300001 - 500000
500001 - 999960

Slug 8-2
Radioactive Materials Area Boundary
Perimeter Fenceline

Originating File:
X:\GPS-Maywood\Projects\Pilot Demo\PD Slug Coordinates.apr

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File Name: X:\GPS-Maywood\Pilot Support Documentation\Slug Coordinates.ppt

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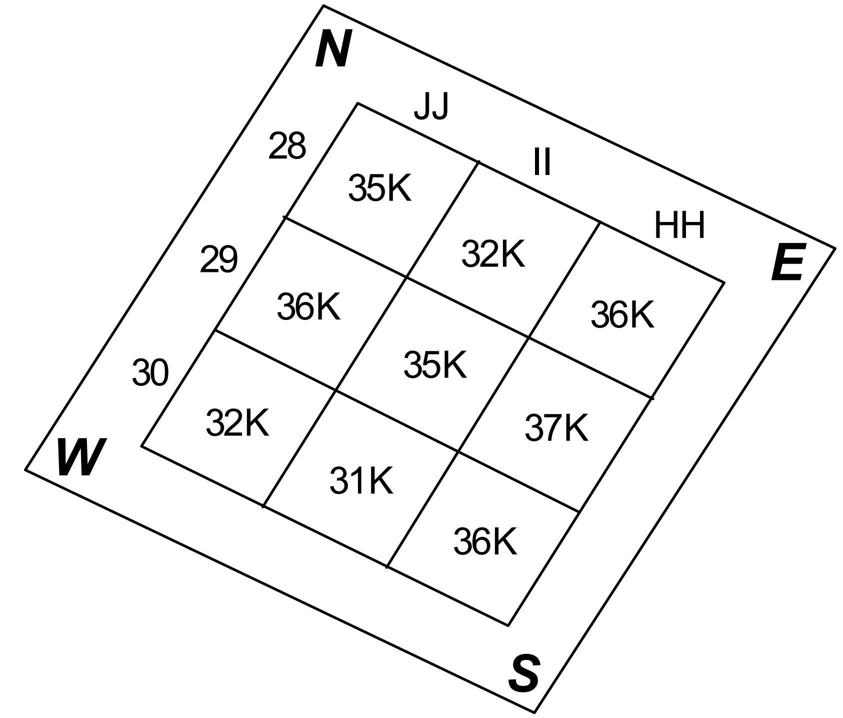
Figure 32

Pilot Plant Demonstration Soil Acquisition Slug Surveys -- Slug/Batch 8-2

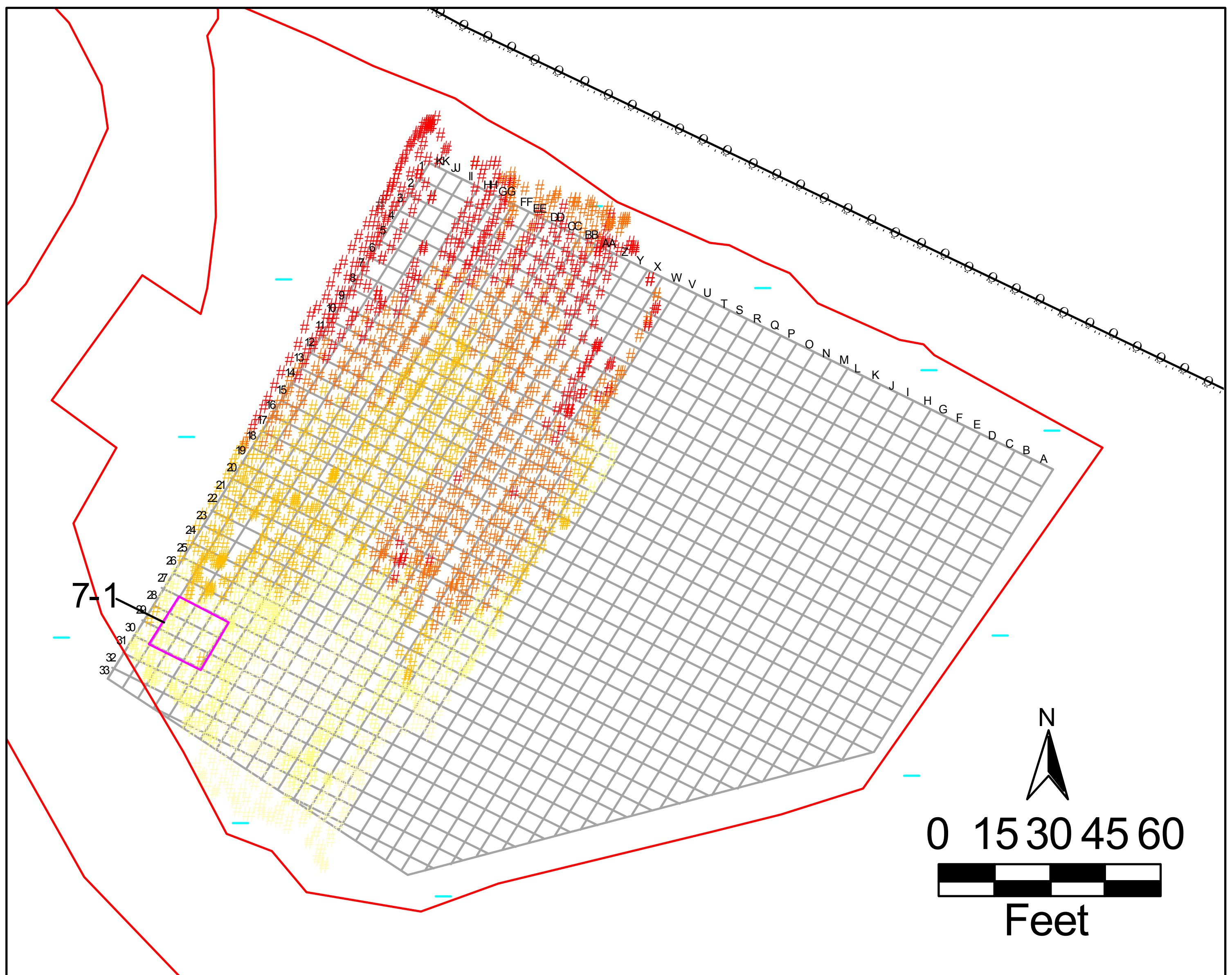
Contract Number: DACW41-99-D-9001
Delivery Order Number:
Project Number:
Drawing Number: PPDR-32

Date Processed: 10-4-00
Beginning Elevation: 62' Above MSL
Slug Depth: 2'



K = 1,000 counts per minute

CPM
9400 - 20000
20001 - 40000
40001 - 60000
60001 - 100000
100001 - 300000
300001 - 500000
500001 - 999960



Slug 7-1
Radioactive Materials Area Boundary
Perimeter Fenceline

Originating File:
X:\GPS-Maywood\Projects\Pilot Demo\PD Slug Coordinates.apr

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Date:
Reviewed by: M. Mendonca
Date:
File Name: X:\GPS-Maywood\Pilot Support Documentation\Slug Coordinates.ppt

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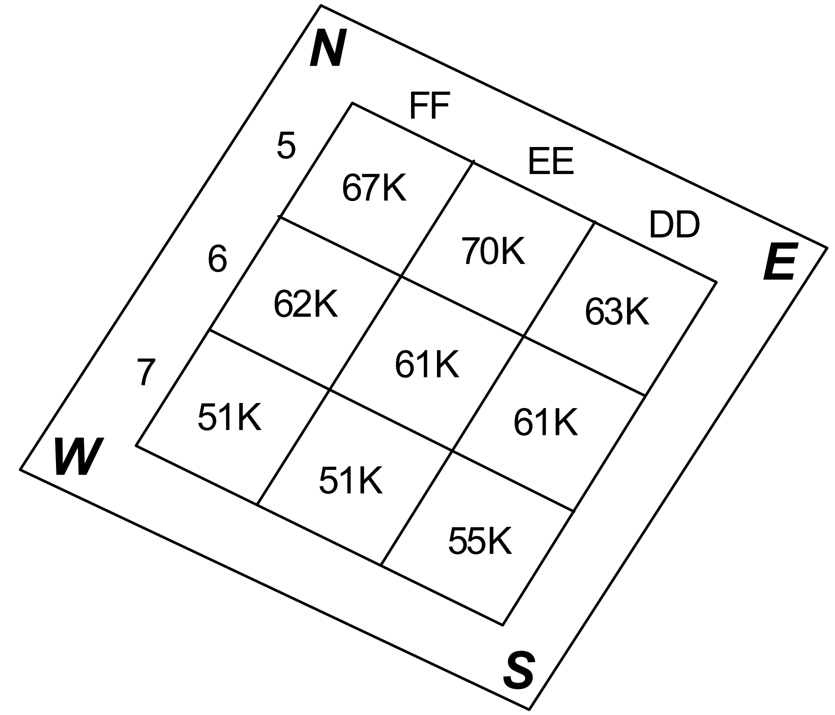
Figure 27
Pilot Plant Demonstration
Soil Acquisition
Slug Surveys -- Slug/Batch 7-1

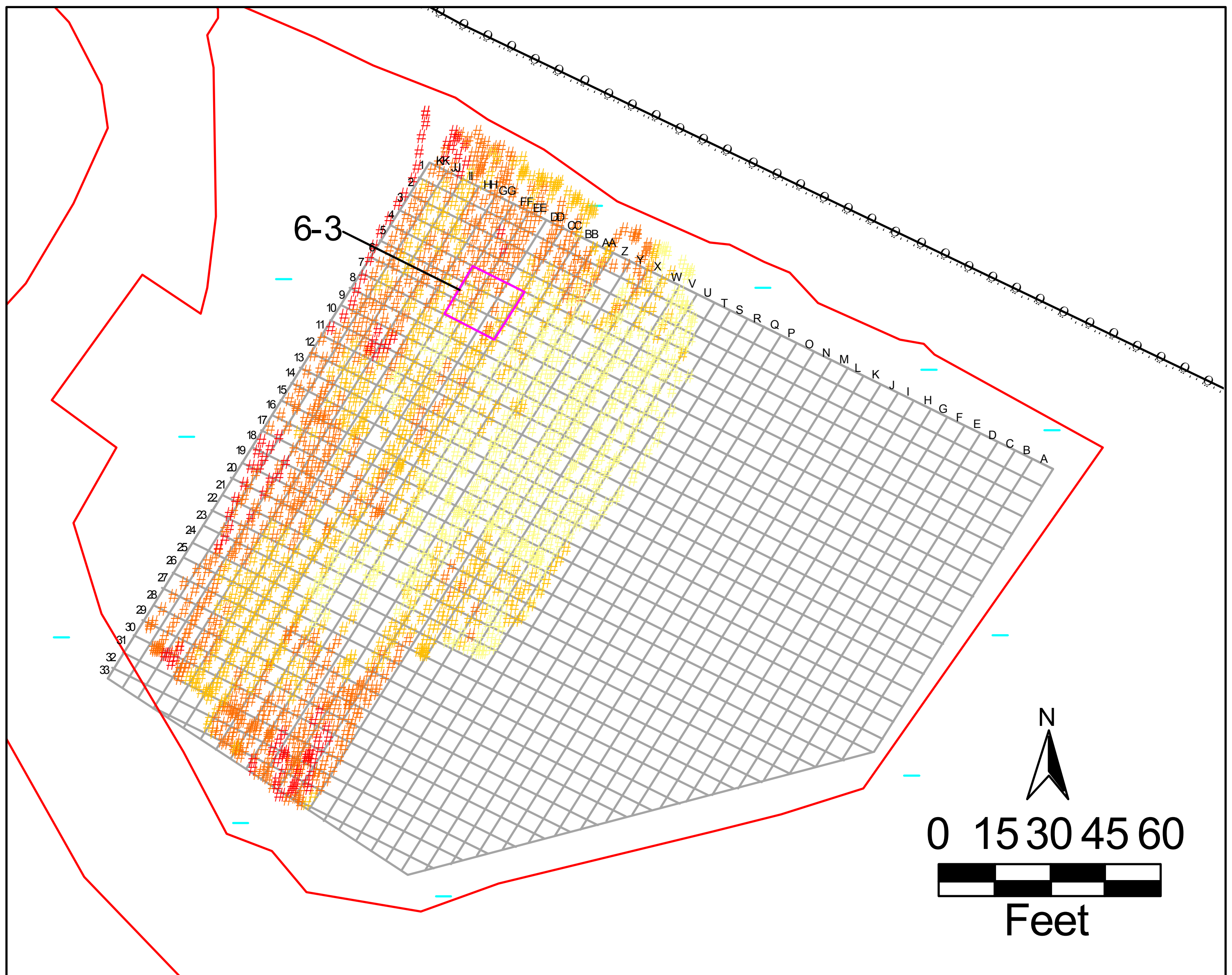
Contract Number: DACW41-99-D-9001
Delivery Order Number:
Project Number:
Drawing Number: PPDR-27

Date Processed: 10-20-00
Beginning Elevation: 60' Above MSL
Slug Depth: 3'



K = 1,000 counts per minute

CPM
9400 - 20000
20001 - 40000
40001 - 60000
60001 - 100000
100001 - 300000
300001 - 500000
500001 - 999960



Slug 6-3
Radioactive Materials Area Boundary
Perimeter Fenceline

Originating File:
X:\GPS-Maywood\Projects\Pilot Demo\PD Slug Coordinates.apr

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Date: 1-25-01
Reviewed by: M. Mendonca
Date:
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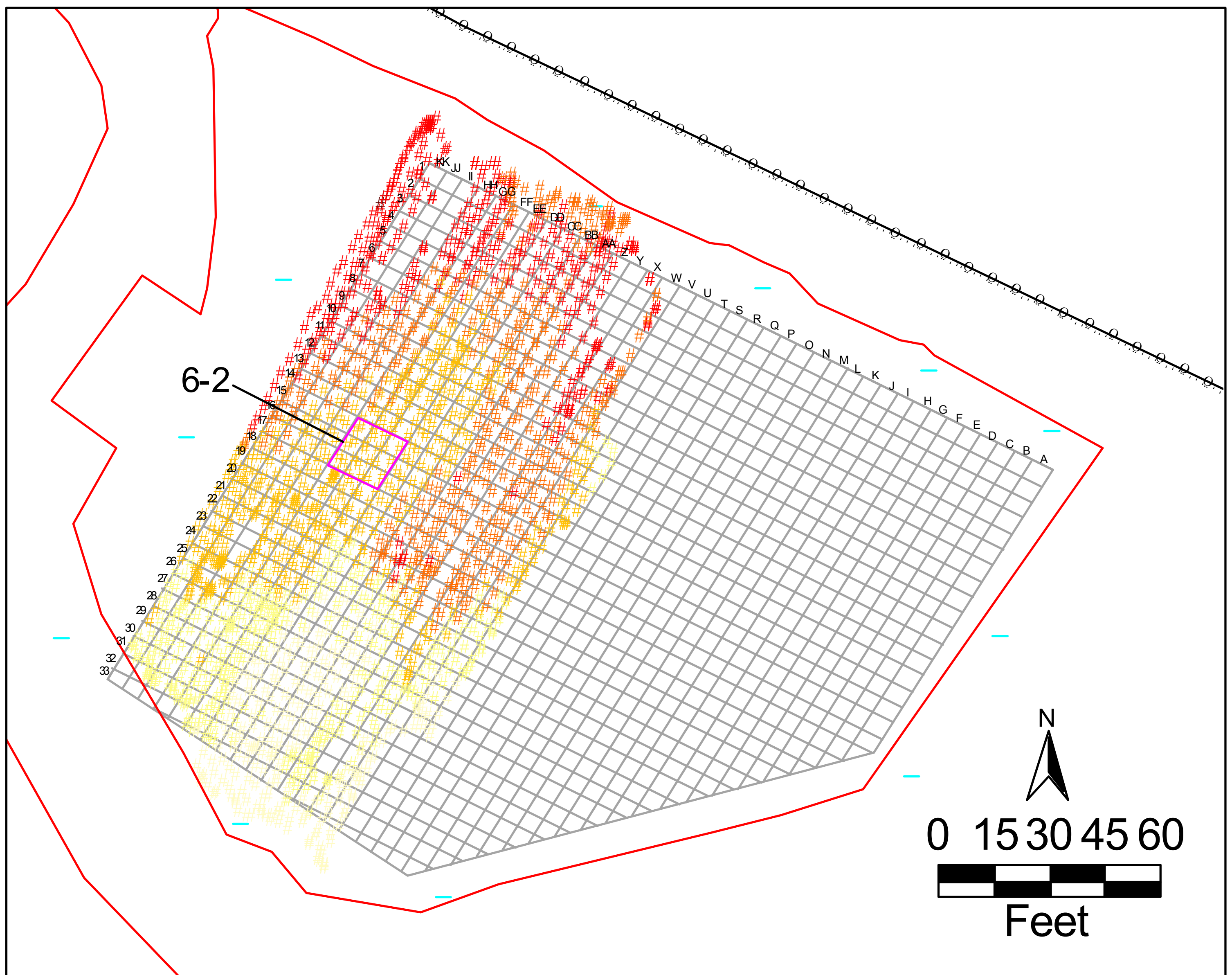
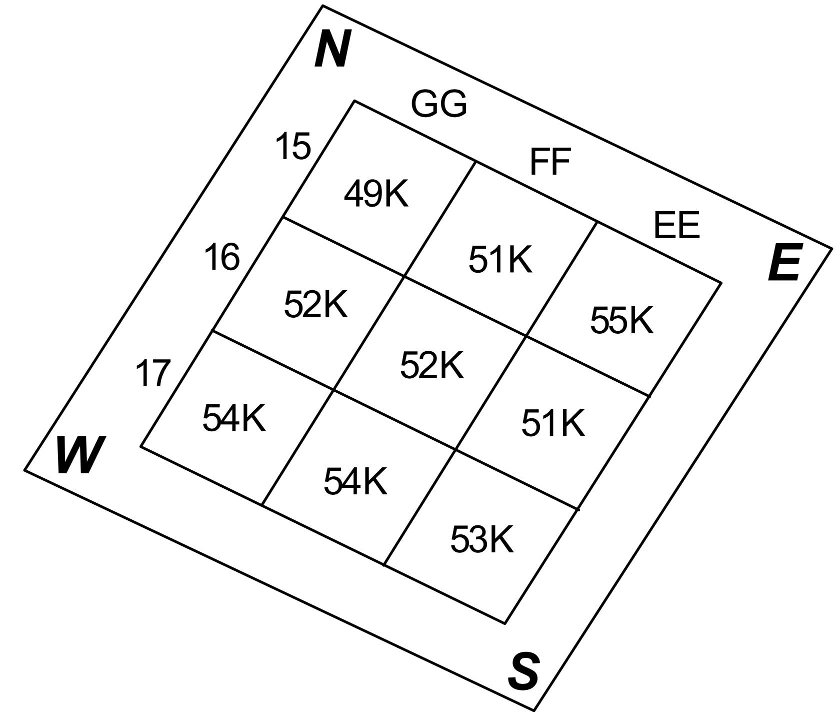
Figure 26
Pilot Plant Demonstration
Soil Acquisition
Slug Surveys -- Slug/Batch 6-3

Contract Number: DACW41-99-D-9001
Delivery Order Number:
Project Number:
Drawing Number: PPDR-26

Date Processed: 10-5-00
Beginning Elevation: 62' Above MSL
Slug Depth: 2'





K = 1,000 counts per minute

CPM

- 9400 - 20000
- 20001 - 40000
- 40001 - 60000
- 60001 - 100000
- 100001 - 300000
- 300001 - 500000
- 500001 - 999960

- Slug 6-2
- Radioactive Materials Area Boundary
- Perimeter Fenceline

Originating File:
X:\GPS-Maywood\Projects\Pilot Demo\PD Slug Coordinates.apr

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Reviewed by: M. Mendonca | Date: | File Name: X:\GPS-Maywood\Pilot Support Documentation\Slug Coordinates.ppt

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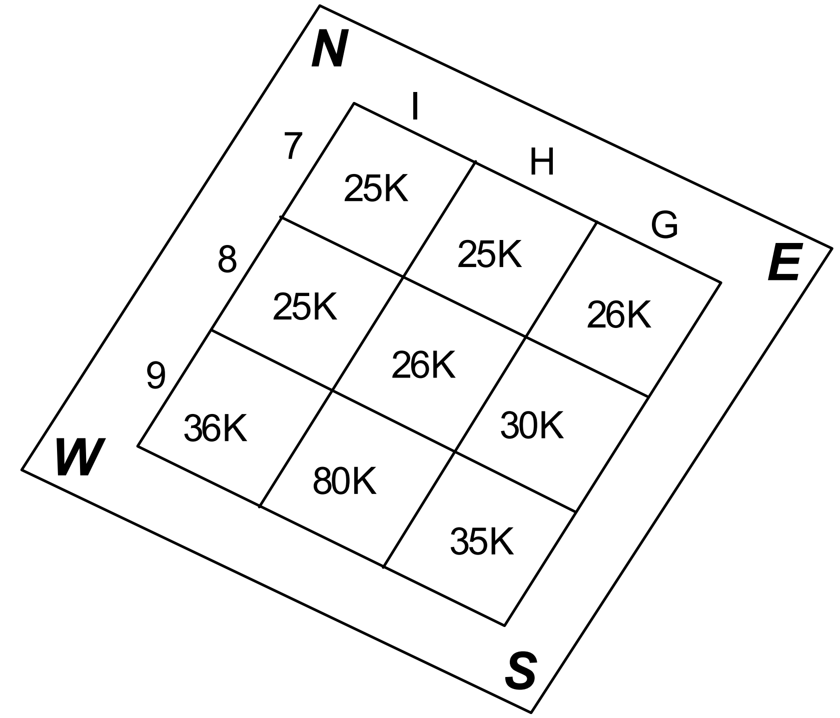
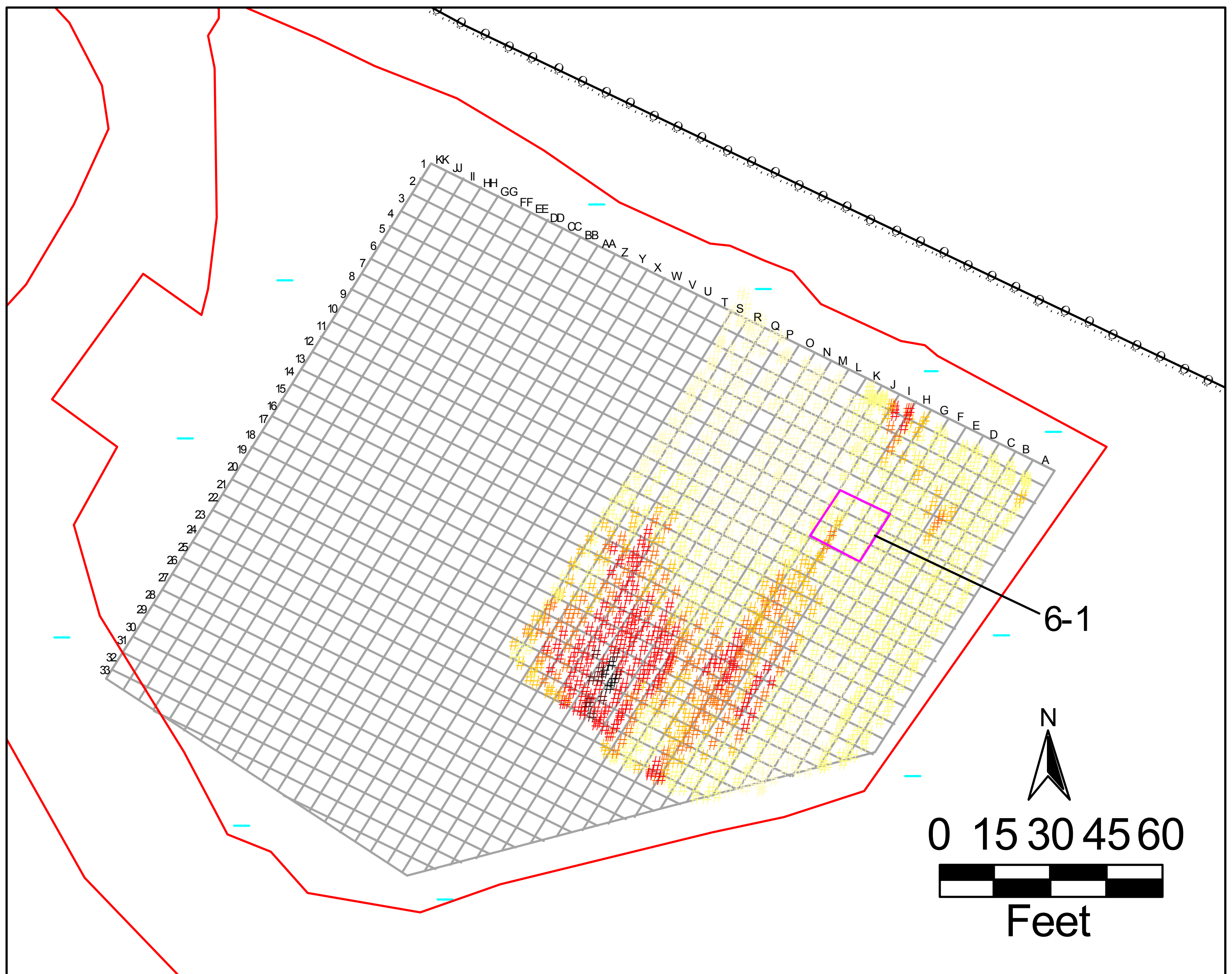
Figure 25
Pilot Plant Demonstration
Soil Acquisition
Slug Surveys -- Slug/Batch 6-2

Contract Number: DACW41-99-D-9001
Delivery Order Number:
Project Number:
Drawing Number: PPDR-25

Date Processed: 9-14-00
Beginning Elevation: 59' Above MSL
Slug Depth: 2'



K = 1,000 counts per minute



CPM

- 9400 - 20000
- 20001 - 40000
- 40001 - 60000
- 60001 - 100000
- 100001 - 300000
- 300001 - 500000
- 500001 - 999960

Slug 6-1
Radioactive Materials Area Boundary
Perimeter Fenceline

Originating File:
X:\GPS-Maywood\Projects\Pilot Demo\PD Slug Coordinates.apr

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Date:
Approved: R. Skryness
Date: 1-25-01
Reviewed by: M. Mendonca
Date:
File Name: X:\GPS-Maywood\Pilot Support Documentation\Slug Coordinates.ppt

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Figure 24
Pilot Plant Demonstration
Soil Acquisition
Slug Surveys -- Slug/Batch 6-1

Contract Number: DACW41-99-D-9001
Delivery Order Number:
Project Number:
Drawing Number: PPDR-24

APPENDIX F
RADIOLOGICAL & CHEMICAL LABORATORY SAMPLE RESULTS

PROCEDURE FOR VIEWING APPENDIX F

Appendix F is an MS Access application created using Access 97. The application is "read only" when the file is opened from the CD using MS Access 97.

The application will not open directly from the CD using MS Access 2000. The following steps should be taken to open the file:

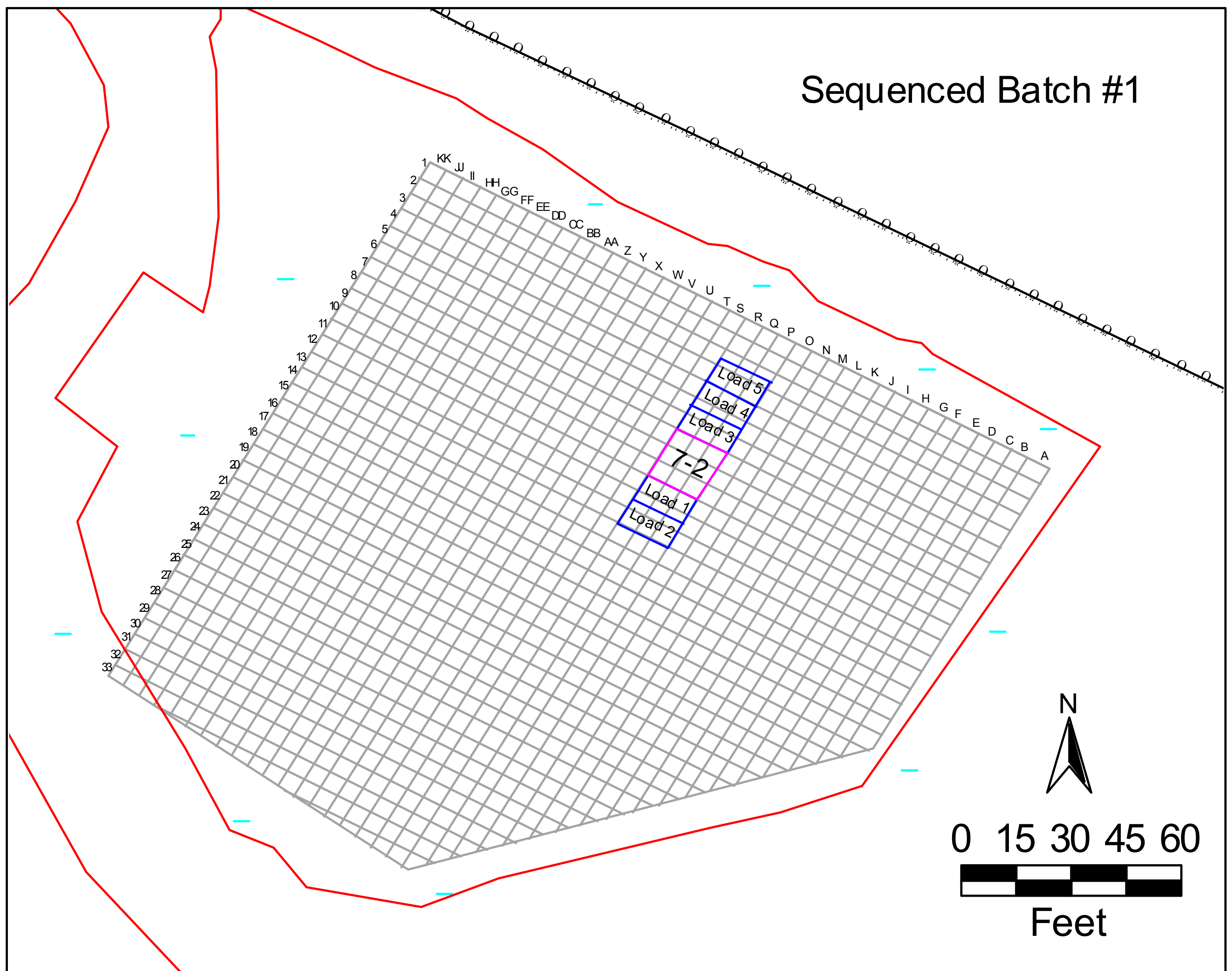
1. Copy the file to a network drive or computer hard drive.
2. Using the mouse, "right click" on the file name, and choose "Properties" from the menu that opens.
3. In the Properties dialogue box, uncheck the "read only" checkbox and close the Properties dailogue box.
4. Double click on the database file name to open Appendix F. You will be asked to choose whether you want to open the file in Access 97 format or convert it to Access 2000. Select your preferred choice.

APPENDIX G
SEQUENCED BATCH COORDINATES & WALKOVER SURVEYS

Date Processed: 10-12-00

Beginning Elevation: 55' Above MSL

Slug/Batch Depth - 2'



Load #	Coordinates	
	Northing	Easting
1	752718.11	2164668.94
	752711.43	2164682.46
	752705.10	2164678.49
	752711.77	2164664.97
2	752711.77	2164664.97
	752705.10	2164678.49
	752698.65	2164674.46
	752705.33	2164660.94
3	752737.27	2164680.93
	752730.47	2164694.37
	752724.21	2164690.46
	752730.89	2164676.94
4	752743.67	2164684.94
	752736.99	2164698.45
	752730.47	2164694.37
	752737.27	2164680.93
5	752750.08	2164688.95
	752743.28	2164702.39
	752736.99	2164698.45
	752743.67	2164684.94

Sequenced Batch #1

Slug Location

Radioactive Materials Area Boundary

Perimeter Fenceline

Originating File:
X:\GPS-Maywood\Projects\Pilot Demo\PD Slug Coordinates.apr

U.S. Army Corps of Engineers
NEW YORK DISTRICT

STONE & WEBSTER ENVIRONMENTAL TECHNOLOGY & SERVICES

Drawn by: E. Neel
Date: 1-25-01
Approved: R. Skryness
Date:
Reviewed by: M. Mendonca
Date:
File Name: X:\GPS-Maywood\Pilot Support Documentation\Slug Coordinates.ppt

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
MAYWOOD, NEW JERSEY

FUSRAP

FUSRAP MAYWOOD SUPERFUND SITE
MAYWOOD, NEW JERSEY

Figure 12

Pilot Plant Demonstration
Soil Acquisition
Sequenced Batch #1 - Coordinates

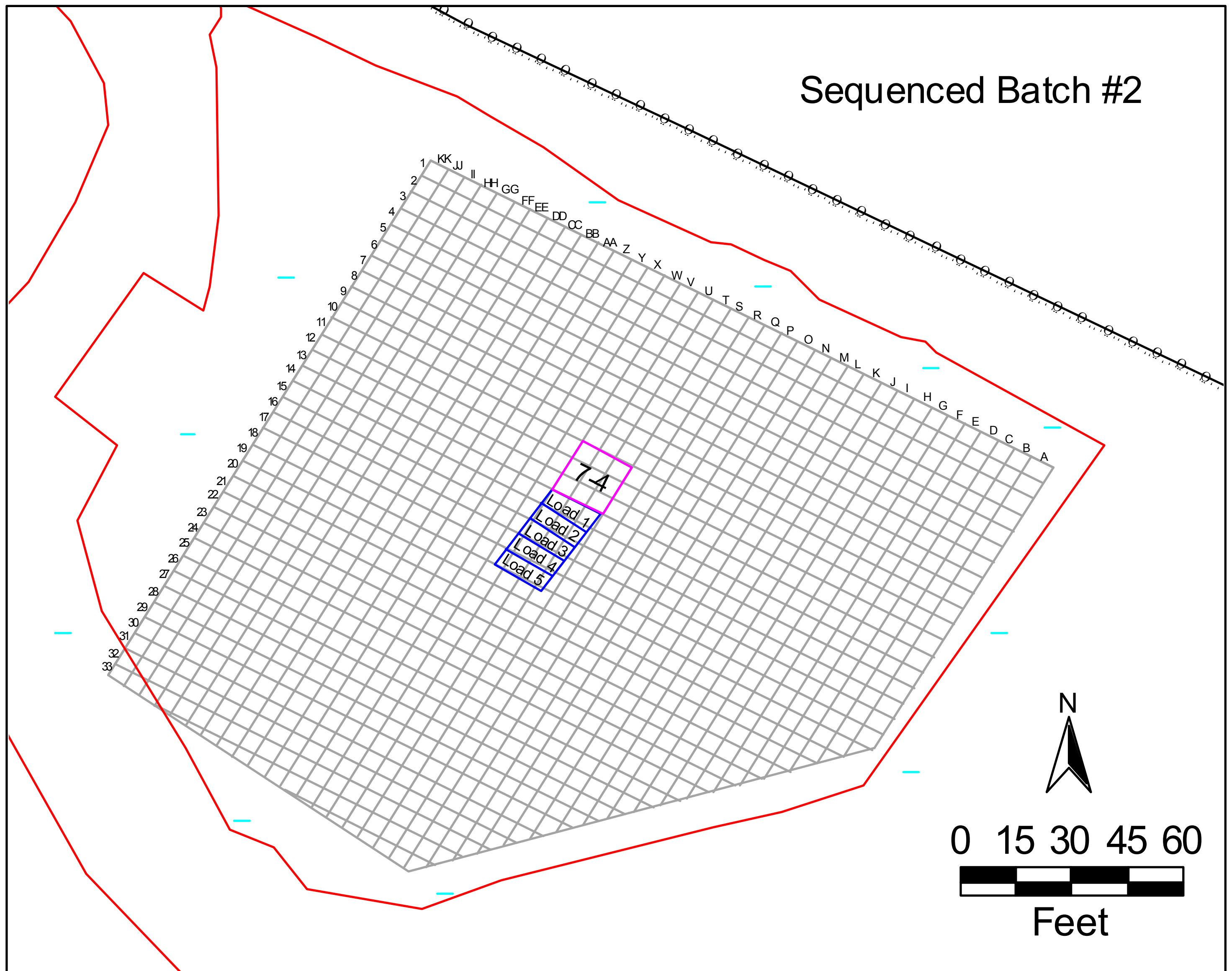
Contract Number: DACW41-99-D-9001
Delivery Order Number:
Project Number:
Drawing Number: PPDR-12

Date Processed: 10-19-00

Beginning Elevation: 60' Above MSL

Slug/Batch Depth - 3'

Load #	Coordinates	
	Northing	Easting
1	752714.41	2164642.57
	752707.79	2164655.82
	752702.66	2164651.85
	752710.32	2164639.56
2	752710.32	2164639.56
	752702.66	2164651.85
	752698.79	2164648.86
	752706.23	2164636.54
3	752706.23	2164636.54
	752698.79	2164648.86
	752694.77	2164645.75
	752702.14	2164633.53
4	752702.14	2164633.53
	752694.77	2164645.75
	752690.72	2164642.61
	752698.06	2164630.52
5	752698.06	2164630.52
	752690.72	2164642.61
	752686.67	2164639.47
	752693.97	2164627.50



Sequenced Batch #2
Slug Location
Radioactive Materials Area Boundary
Perimeter Fenceline

Originating File:
X:\GPS-Maywood\Projects\Pilot Demo\PD Slug Coordinates.apr

U.S. Army Corps of Engineers
NEW YORK DISTRICT

STONE & WEBSTER ENVIRONMENTAL TECHNOLOGY & SERVICES
Drawn by: E. Neel
Date: 1-25-01
Approved: R. Skryness
Date:
Reviewed by: M. Mendonca
Date:
File Name: X:\GPS-Maywood\Pilot Support Documentation\Slug Coordinates.ppt

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
MAYWOOD, NEW JERSEY

FUSRAP

FUSRAP MAYWOOD SUPERFUND SITE
MAYWOOD, NEW JERSEY

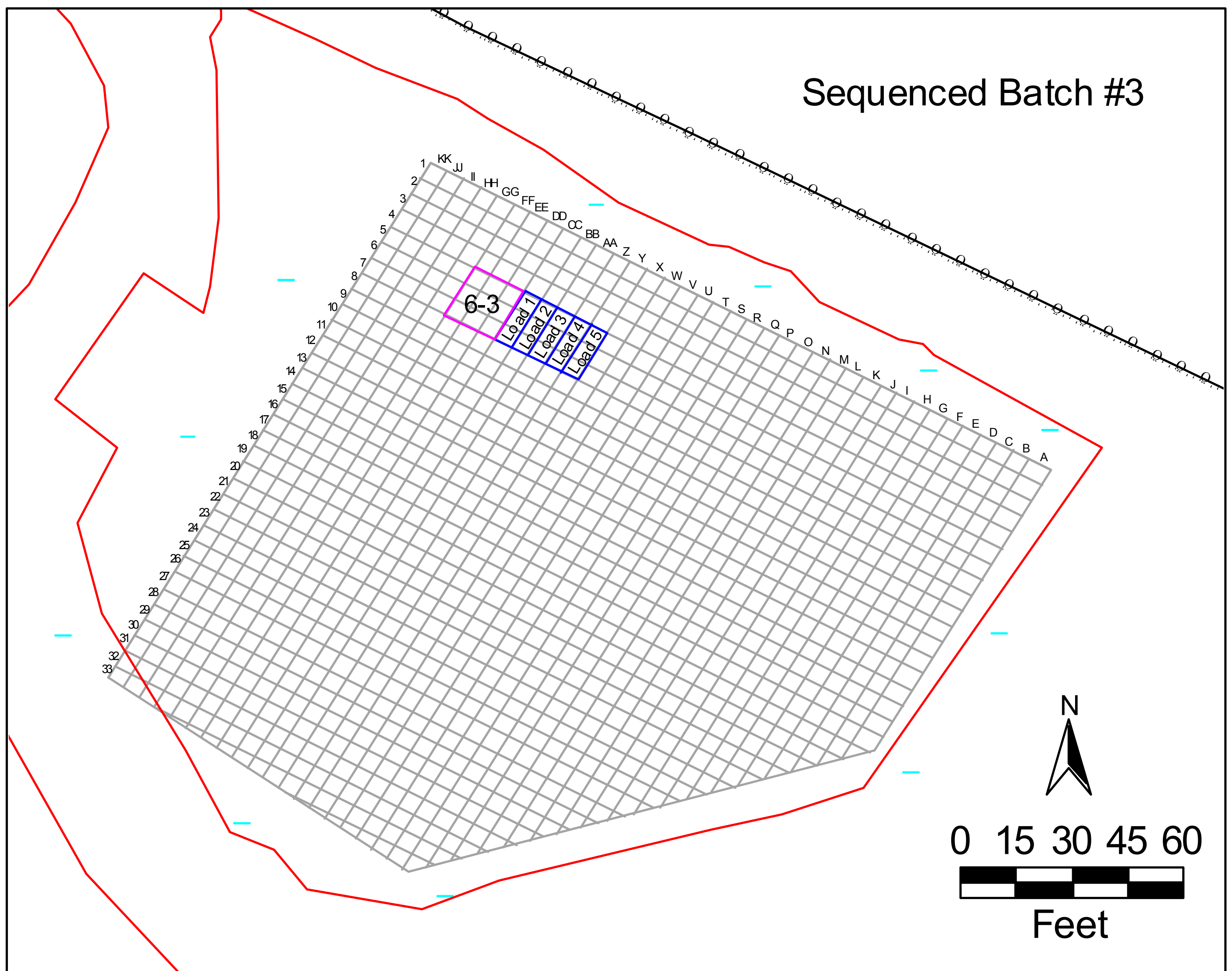
Figure 13
Pilot Plant Demonstration
Soil Acquisition
Sequenced Batch #2 - Coordinates

Contract Number: DACW41-99-D-9001
Delivery Order Number:
Project Number:
Drawing Number: PPDR-13

Date Processed: 10-23-00

Beginning Elevation: 60' Above MSL

Slug/Batch Depth - 3'



Load #	Coordinates	
	Northing	Easting
1	752768.15	2164635.38
	752765.93	2164639.88
	752753.15	2164631.89
	752755.37	2164627.38
2	752765.93	2164639.88
	752763.70	2164644.39
	752750.92	2164636.39
	752753.15	2164631.89
3	752763.70	2164644.39
	752761.48	2164648.90
	752748.70	2164640.90
	752750.92	2164636.39
4	752761.48	2164648.90
	752759.25	2164653.40
	752746.47	2164645.40
	752748.70	2164640.90
5	752759.25	2164653.40
	752757.02	2164657.91
	752744.25	2164649.91
	752746.47	2164645.40

Sequenced Batch #3

Slug Location

Radioactive Materials Area Boundary

Perimeter Fenceline

Originating File:
X:\GPS-Maywood\Projects\Pilot Demo\PD Slug Coordinates.apr

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NEW YORK DISTRICT

STONE & WEBSTER ENVIRONMENTAL TECHNOLOGY & SERVICES

Drawn by: E. Neel | Date: 1-25-01 | Approved: R. Skryness | Date:

Reviewed by: M. Mendonca | Date: | File Name: X:\GPS-Maywood\Pilot Support Documentation\Slug Coordinates.ppt

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
MAYWOOD, NEW JERSEY

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FUSRAP MAYWOOD SUPERFUND SITE
MAYWOOD, NEW JERSEY

Figure 14

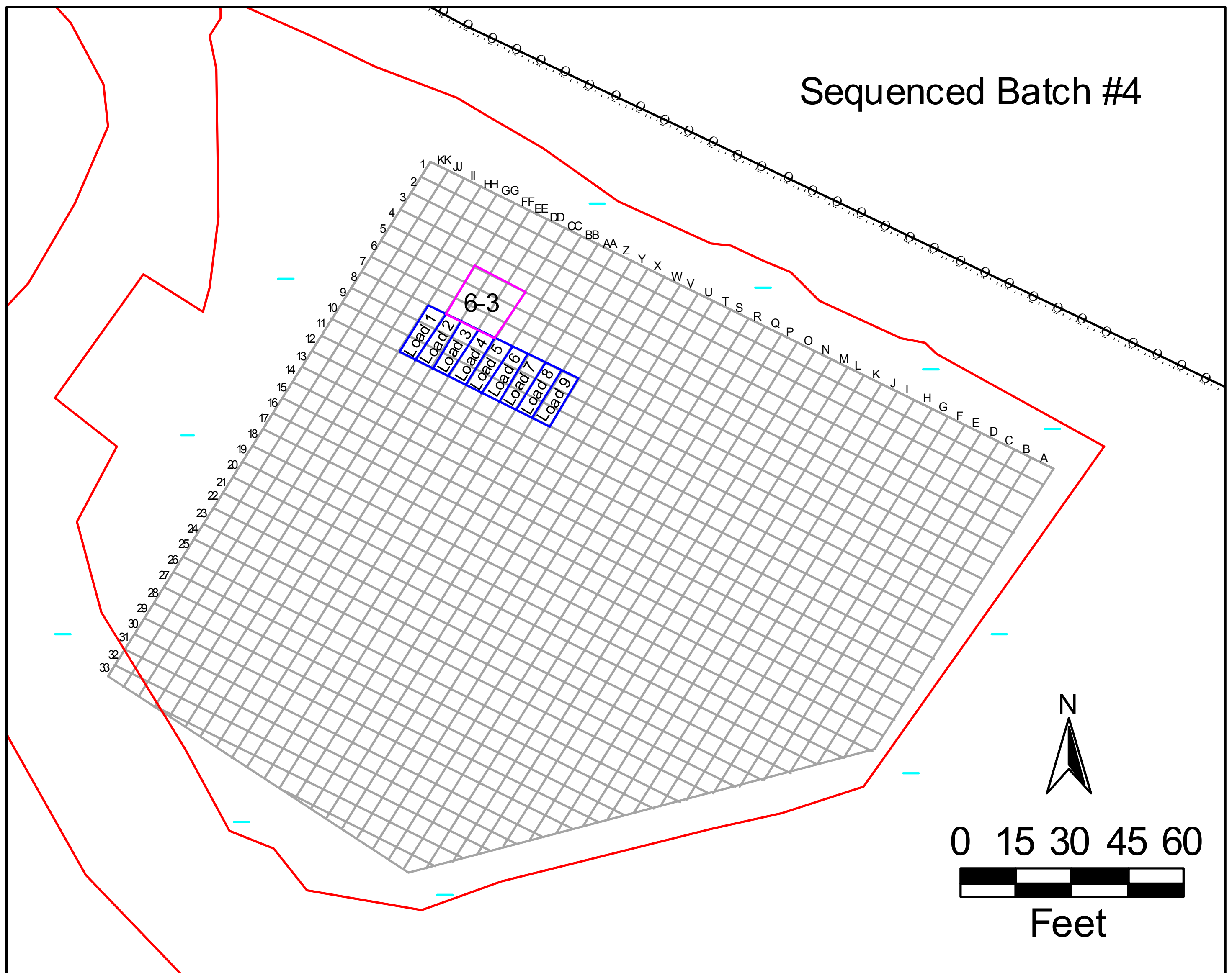
Pilot Plant Demonstration
Soil Acquisition
Sequenced Batch #3 - Coordinates

Contract Number: DACW41-99-D-9001
Delivery Order Number:
Project Number:
Drawing Number: PPDR-14

Date Processed: 10-24-00

Beginning Elevation: 60' Above MSL

Slug/Batch Depth - 3'



Load #	Coordinates	
	Northing	Easting
1	752764.28	2164609.36
	752762.05	2164613.86
	752749.27	2164605.87
	752751.50	2164601.36
2	752762.05	2164613.86
	752759.83	2164618.37
	752747.05	2164610.37
	752749.27	2164605.87
3	752759.83	2164618.37
	752757.60	2164622.87
	752744.82	2164614.88
	752747.05	2164610.37
4	752757.60	2164622.87
	752755.37	2164627.38
	752742.60	2164619.38
	752744.82	2164614.88
5	752755.37	2164627.38
	752753.15	2164631.89
	752740.37	2164623.89
	752742.60	2164619.38

Load #	Coordinates	
	Northing	Easting
6	752753.15	2164631.89
	752750.92	2164636.39
	752738.14	2164628.39
	752740.37	2164623.89
7	752750.92	2164636.39
	752748.70	2164640.90
	752735.92	2164632.90
	752738.14	2164628.39
8	752748.70	2164640.90
	752746.47	2164645.40
	752733.69	2164637.40
	752735.92	2164632.90
9	752746.47	2164645.40
	752744.25	2164649.91
	752731.47	2164641.91
	752733.69	2164637.40

Legend:
- Sequenced Batch #4
- Slug Location
- Radioactive Materials Area Boundary
- Perimeter Fenceline

Originating File:
X:\GPS-Maywood\Projects\Pilot Demo\PD Slug Coordinates.apr

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NEW YORK DISTRICT

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Drawn by: E. Neel | Date: 1-25-01 | Reviewed by: M. Mendonca | Date: | Approved: R. Skryness | Date: | File Name: X:\GPS-Maywood\Pilot Support Documentation\Slug Coordinates.ppt

U.S. ARMY ENGINEER DIVISION
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MAYWOOD, NEW JERSEY

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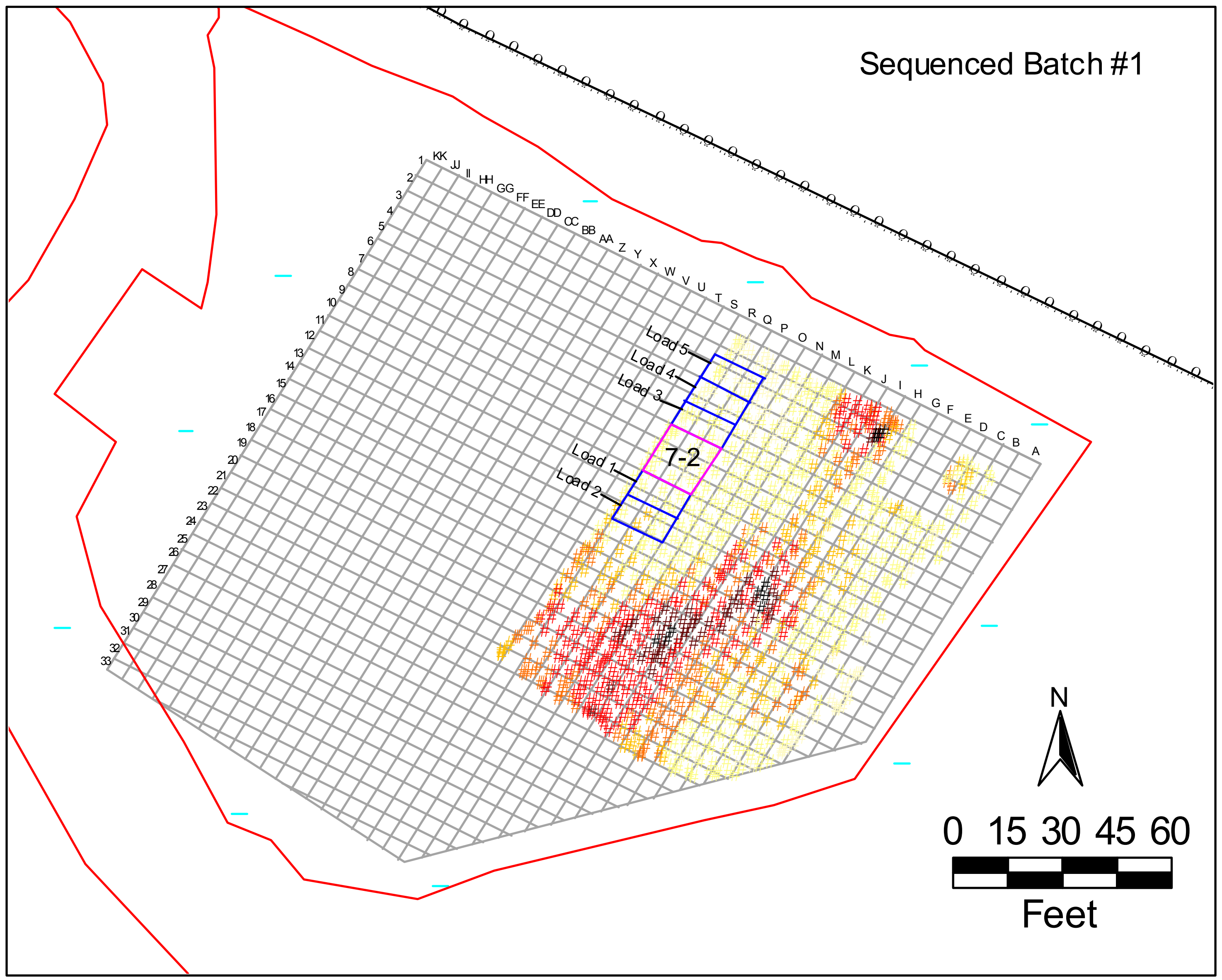
MAYWOOD, NEW JERSEY

Figure 15
Pilot Plant Demonstration
Soil Acquisition
Sequenced Batch #4 - Coordinates

Contract Number: DACW41-99-D-9001
Delivery Order Number:
Project Number:
Drawing Number: PPDR-15

Date Processed: 10-12-00
Beginning Elevation: 57' Above MSL
Slug/Batch Depth - 2'



CPM

- 9400 - 20000
- 20001 - 40000
- 40001 - 60000
- 60001 - 100000
- 100001 - 300000
- 300001 - 500000
- 500001 - 999960

Sequenced Batch #1
Slug Location
Radioactive Materials Area Boundary
Perimeter Fenceline

Originating File:
X:\GPS-Maywood\Projects\Pilot Demo\PD Slug Coordinates.apr

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Drawn by: E. Neel | Date: 1-25-01 | Approved: R. Skryness | Date:
Reviewed by: M. Mendonca | Date: | File Name: X:\GPS-Maywood\Pilot Support Documentation\Slug Locations.ppt

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MAYWOOD, NEW JERSEY

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MAYWOOD, NEW JERSEY

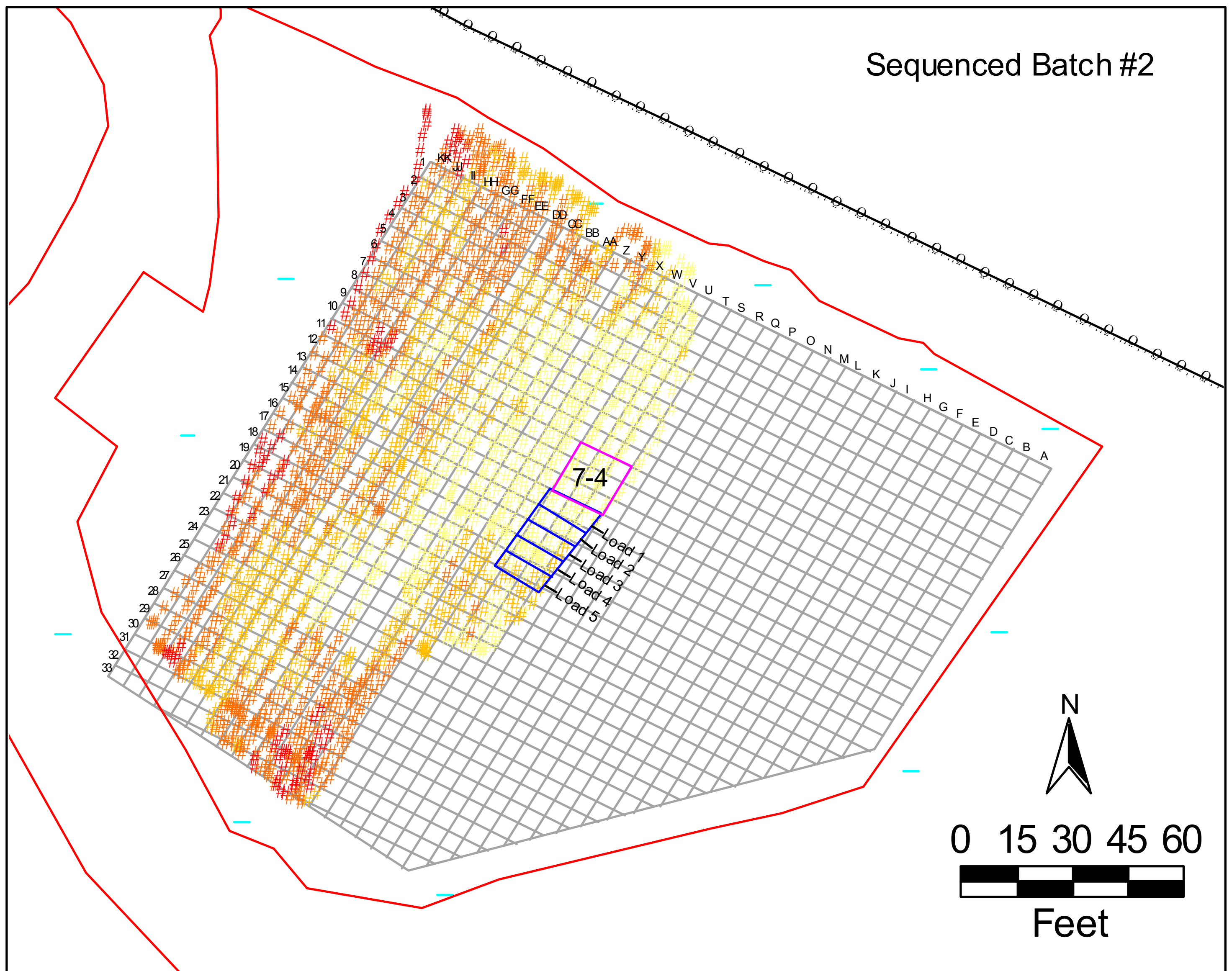
Figure 35
Pilot Plant Demonstration
Soil Acquisition
Sequenced Batch #1 Walkover Survey

Contract Number: DACW41-99-D-9001
Delivery Order Number:
Project Number:
Drawing Number: PPDR-35

Date Processed: 10-19-00

Beginning Elevation: 60' Above MSL

Slug/Batch Depth - 3'



CPM

- 9400 - 20000
- 20001 - 40000
- 40001 - 60000
- 60001 - 100000
- 100001 - 300000
- 300001 - 500000
- 500001 - 999960

- Sequenced Batch #2
- Slug Location
- Radioactive Materials Area Boundary
- Perimeter Fenceline

Originating File:
X:\GPS-Maywood\Projects\Pilot Demo\PD Slug Coordinates.apr

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Drawn by: E. Neel | Date: 1-25-01 | Approved: R. Skryness | Date:
Reviewed by: M. Mendonca | Date:
File Name: X:\GPS-Maywood\Pilot Support Documentation\Slug Locations.ppt

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MAYWOOD, NEW JERSEY

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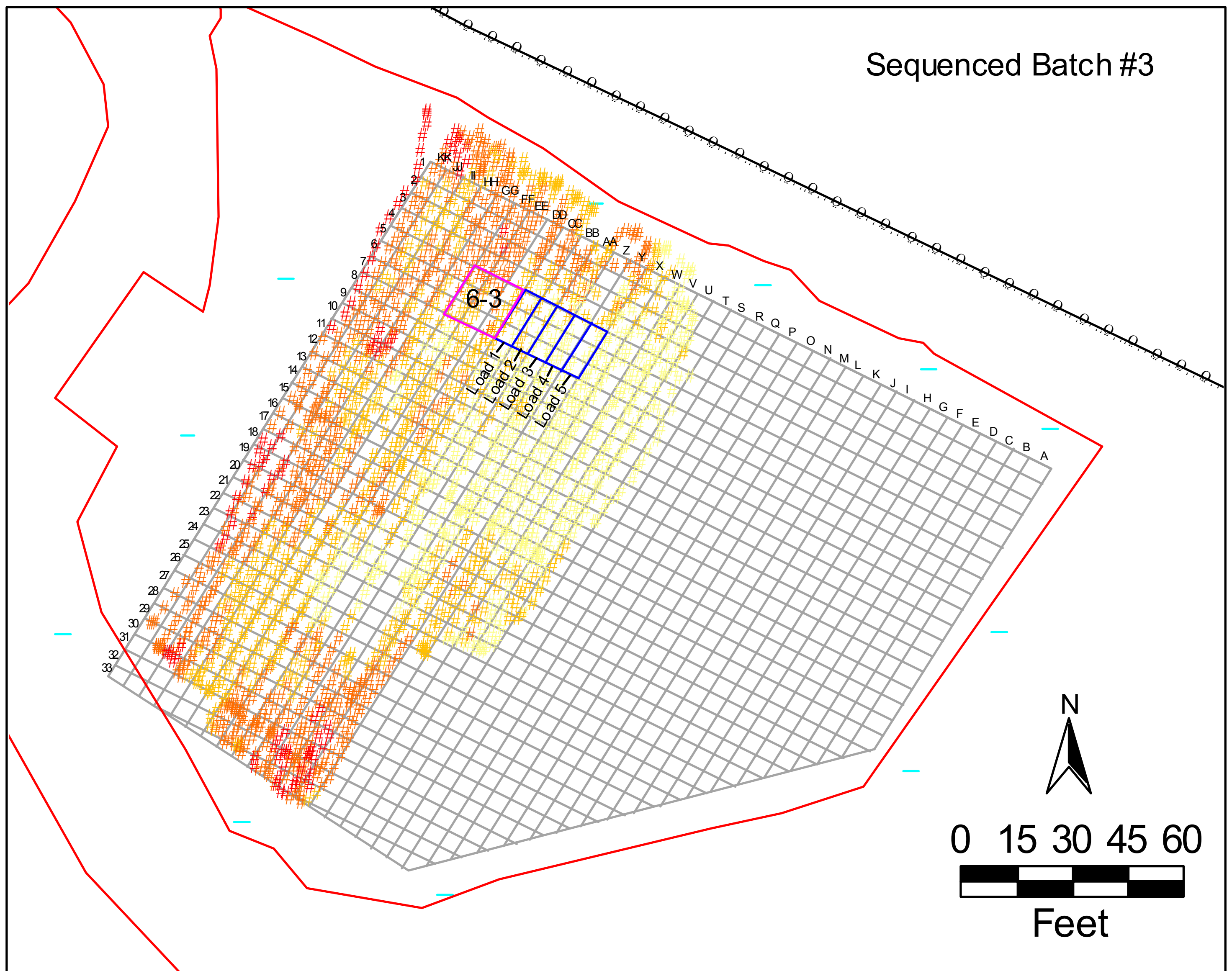
MAYWOOD, NEW JERSEY

Figure 36

Pilot Plant Demonstration
Soil Acquisition
Sequenced Batch #2 Walkover Survey

Contract Number: DACW41-99-D-9001
Delivery Order Number:
Project Number:
Drawing Number: PPDR-36

Date Processed: 10-23-00
Beginning Elevation: 60' Above MSL
Slug/Batch Depth - 3'



CPM
9400 - 20000
20001 - 40000
40001 - 60000
60001 - 100000
100001 - 300000
300001 - 500000
500001 - 999960

Sequenced Batch #3
Slug Location
Radioactive Materials Area Boundary
Perimeter Fenceline

Originating File:
X:\GPS-Maywood\Projects\Pilot Demo\PD Slug Coordinates.apr

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NEW YORK DISTRICT

STONE & WEBSTER ENVIRONMENTAL TECHNOLOGY & SERVICES

Drawn by: E. Neel | Date: 1-25-01 | Approved: R. Skryness | Date:
Reviewed by: M. Mendonca | Date: | File Name: X:\GPS-Maywood\Pilot Support Documentation\Slug Locations.ppt

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
MAYWOOD, NEW JERSEY

FUSRAP

FUSRAP MAYWOOD SUPERFUND SITE
MAYWOOD, NEW JERSEY

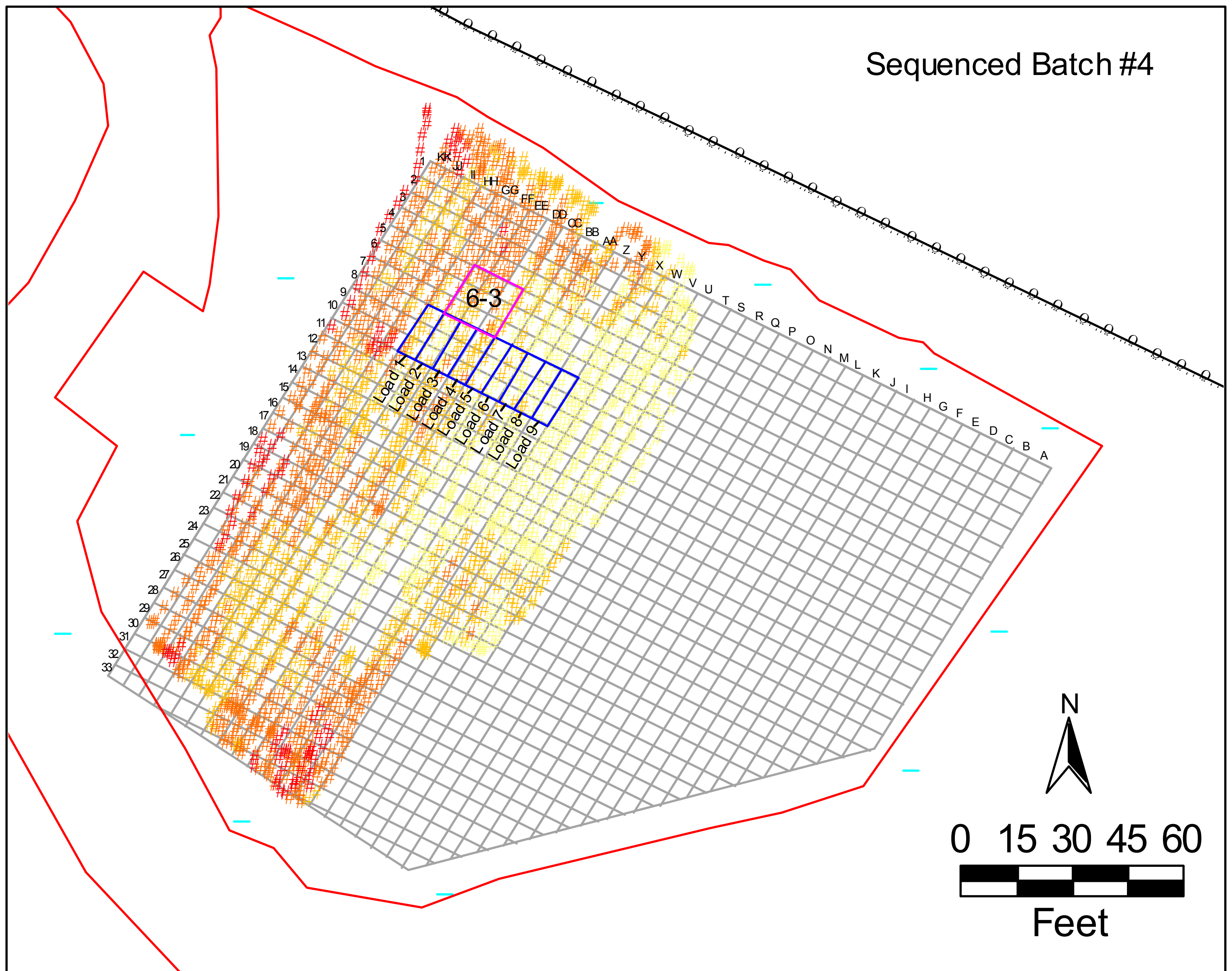
Figure 37
Pilot Plant Demonstration
Soil Acquisition
Sequenced Batch #3 Walkover Survey

Contract Number: DACW41-99-D-9001
Delivery Order Number:
Project Number:
Drawing Number: PPDR-37

Date Processed: 10-24-00

Beginning Elevation: 60' Above MSL

Slug/Batch Depth - 3'



CPM
9400 - 20000
20001 - 40000
40001 - 60000
60001 - 100000
100001 - 300000
300001 - 500000
500001 - 999960

Sequenced Batch #4

Slug Location

Radioactive Materials Area Boundary

Perimeter Fenceline

Originating File:
X:\GPS-Maywood\Projects\Pilot Demo\PD Slug Coordinates.apr

U.S. Army Corps of Engineers
NEW YORK DISTRICT

STONE & WEBSTER ENVIRONMENTAL TECHNOLOGY & SERVICES

Drawn by: E. Neel
Date:
Approved: R. Skryness
Date: 1-25-01
Reviewed by: M. Mendonca
Date:
File Name: X:\GPS-Maywood\Pilot Support Documentation\Slug Locations.ppt

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
MAYWOOD, NEW JERSEY

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FUSRAP MAYWOOD SUPERFUND SITE
MAYWOOD, NEW JERSEY

Figure 38

Pilot Plant Demonstration
Soil Acquisition
Sequenced Batch #4 Walkover Survey

Contract Number: DACW41-99-D-9001
Delivery Order Number:
Project Number:
Drawing Number: PPDR-38

APPENDIX H
GRAIN SIZE ANALYSIS REPORT

ADVANCED TERRA TESTING, Inc.
833 Parfet Street • Lakewood, Colorado 80215 • (303) 232-8308 • Fax: (303) 232-1579

March 19, 2001

Stone & Webster Environmental Engineering Corp.
100 Technology Center Drive
Stoughton, MA 02072-4705

Attn: Ms. Marilva Mendonca
Re: Geotechnical Laboratory Testing Report, FUSRAP Maywood Superfund Site, Maywood, New Jersey

Dear Ms. Mendonca,

Enclosed is our final report pertaining to the above referenced project. The report contains a case narrative, tabular and graphic grain size distribution data, raw test data, electronic spreadsheet data, post test radiological screening data, and other pertinent information.

The data have been arranged in sections, in primary order by boring or test pit designation, and in secondary order by Sample Number Designation.

It has been a pleasure to provide these testing services for you. Should you have any questions, please do not hesitate to call.

Sincerely,
ADVANCED TERRA TESTING, Inc.

Christopher J. Wienecke
Laboratory Director/RSO

Enclosure: Geotechnical Laboratory Testing Report, FUSRAP Maywood Superfund Site, Maywood, New Jersey

R:\SO2162\tm31901.lwp

Geotechnical Laboratory Testing Report

FUSRAP Maywood Superfund Site

Maywood, New Jersey

Presented To:
Stone & Webster Engineering Corporation
100 Technology Center Drive
Stoughton, MA 02072-4705
Project No.: 085750502 & 085750608

Presented By:
Advanced Terra Testing, Inc.
833 Parfet St., Unit A
Lakewood, CO 80215
ATT Project No.: 2162-13 & 2162-14

March 19, 2001

K:\902162\COV31901.bmp

March 19, 2001

Stone & Webster Engineering Corporation
100 Technology Center Drive
Stoughton, MA 02072-4705

Geotechnical Laboratory Testing Report, FUSRAP Maywood Superfund Site, Maywood, New Jersey

The following report contains the results of mechanical grain size (sieve) analyses, hydrometer (sedimentation) analyses and % Solids determinations performed on samples collected at the Maywood Interim Storage Site, in support of the Maywood Environmental Restoration Project. Seven (7) samples were received (4 each 5- gallon containers and 3 each jar samples) by the laboratory. After the samples were screened for radioactivity in accordance with our Radioactive Materials License No. COLO 896-01, testing commenced in general accordance with the Scope of Work provided by Stone & Webster for Subcontract Number 08575. Any deviations from the Scope of Work were requested by Stone & Webster, and are discussed below.

INTRODUCTION

The purpose of this report is to present the results of mechanical (sieve) grain size analyses, hydrometer (sedimentation) analyses, and % Solids determinations of samples collected at the Maywood Interim Storage Site (MISS), in support of the Maywood Environmental Restoration Project, being conducted in part by Stone and Webster. Following this introduction and the methodology descriptions are sections containing the tabular and graphical grain size data, % Solids determinations and copies of the raw data for each test conducted. The last section contains ancillary information such as the laboratory receipt radiological screening data, post test radiological screening data (by sieve split), copies of the Chain of Custody Documents and other information pertinent to the testing campaign.

METHODOLOGY DESCRIPTION

Following receipt radiological screening, the samples were prepared in general accordance with ASTM D 421 (Dry Preparation of Soil Samples for Particle-Size Analysis and Determination of Soil Constants). The air dried samples were split over a #10 mesh sieve. This was coincident with the laboratory's standard practice for grain size analyses.

The coarse fraction of each sample (3-inch, 1.5-inch, 3/4-inch, 3/8-inch, #4 mesh and #10 mesh) was washed, oven dried and sieved. Dry mass of the individual coarse fractions was recorded on the raw data sheets. A representative portion of the minus #10 mesh material (approximately 75 to 100 grams) was set aside for hydrometer and specific gravity testing. A 25 to 30 gram specimen of this material was oven dried to determine the hygroscopic moisture condition of the air dried soil (in support of the hydrometer testing). Approximately 50 to 60 grams of the remaining minus #10 mesh material was mixed with deflocculant for a minimum period of 16 hours, and dispersed (using stirring apparatus A, Section 9.2 and 9.3 of ASTM D 422) for a period of one minute. The dispersed soil-water slurry was subjected to hydrometer testing, and was subsequently washed and sieved through the Number 10, 20, 40, 60, 100, and 200 mesh sieves. Oven dry mass retained on each sieve was recorded on the raw data sheets.

Once the dry mass information had been collected for each sample, the data were entered into a LOTUS spreadsheet. The spreadsheet reports sample identification, tabular grain size information, and graphical representation of the grain size distribution. Grain size spreadsheet reports for each sample are included in the section entitled "Hydrometer Analysis with Mechanical Grain Size, ASTM D 422".

In compliance with the Scope of Work, post test radiological screening was conducted on the material retained on each individual sieve pertinent to Project No. 085750502. These individual sieve splits were labeled for specific sieve size and original sample number identification. The individual sieve splits were then placed in a larger container (i.e. large Ziploc bags), identified by primary sample number, and returned to the site for further analytical testing.

COMMENTS and OBSERVATIONS

The geotechnical testing of 7 radiologically contaminated soil samples was conducted in accordance with the ASTM protocols referenced, and in general accordance with the Scope of Work, with the following exceptions:

1) Moisture content analyses (ASTM D 2216) were not conducted on this group of samples. Moisture content testing was not requested on either bulk samples or the jar samples, as collection procedures were not directed at achieving insitu moisture conditions.

2) % Solids were requested and performed on the three jar samples received under Project No. 085750608.

REFERENCES

The following references were used in performing the requested analyses:

1) ASTM D 421, "Dry Preparation of Soil Samples for Particle-Size Analysis and Determination of Soil Constants"

2) ASTM D 422, "Particle-Size Analysis of Soils"

3) ASTM D 854, "Specific Gravity of Soils"

4) ASTM D 1140, "Amount of Material in Soils Finer than the No. 200 Sieve"

5) " Scope of Work, Geotechnical Engineering Laboratory Services, Excavation of Engineering Test Pits at MISS, FUSRAP Maywood Superfund Site, Maywood, New Jersey"

HYDROMETER ANALYSIS
With Mechanical Grain Size Analysis
ASTM D 422

MECHANICAL ANALYSIS - SIEVE TEST DATA
ASTM D 422

CLIENT	Stone & Webster	JOB NO.	2162-13
BORING NO.	PT#7	SAMPLED	09/14/00 MM
DEPTH	0-0'	DATE TESTED	12/29/00 DPM
SAMPLE NO.	12b-35860	WASH SIEVE	Yes
SOIL DESCR.	Proj # 085750608	DRY SIEVE	No
LOCATION	FUSRAP Maywood Superfund Site		

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No
Wt. Wet Soil & Pan (g)	93.08
Wt. Dry Soil & Pan (g)	86.94
Wt. Lost Moisture (g)	6.14
Wt. of Pan Only (g)	3.65
Wt. of Dry Soil (g)	83.29
Moisture Content %	7.4
Wt. Hydrom. Sample Wet (g)	56.32
Wt. Hydrom. Sample Dry (g)	52.45

WASH SIEVE ANALYSIS

Wt. Total Sample Wet (g)	546.65
Weight of + #10 Before Washing (g)	128.14
Weight of + #10 After Washing (g)	109.67
Weight of - #10 Wet (g)	418.51
Weight of - #10 Dry (g)	406.98
Wt. Total Sample Dry (g)	516.65
Calc. Wt. "W" (g)	66.59
Calc. Mass + #10	14.13

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
3"	0.00	0.00	0.00	0.00	0.0	100.0
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	0.00	0.00	0.00	0.0	100.0
3/8"	0.00	10.20	10.20	10.20	2.0	98.0
#4	0.00	51.78	51.78	61.98	12.0	88.0
#10	0.00	47.69	47.69	109.67	21.2	78.8
#20	3.76	8.99	5.23	5.23	29.1	70.9
#40	3.55	8.49	4.94	10.17	36.5	63.5
#60	3.54	9.30	5.76	15.93	45.2	54.8
#100	3.86	12.99	9.13	25.06	58.9	41.1
#200	3.60	12.16	8.56	33.62	71.7	28.3

Data entered by: DPM Date: 01/16/2001
Data checked by: am Date: 01/16/01
FileName: SOH05860

ADVANCED TERRA TESTING, INC.

HYDROMETER ANALYSIS - SEDIMENTATION DATA

CLIENT Stone & Webster

JOB NO. 2162-13

BORING NO.	PT#7	SAMPLED	09/14/00 MM
DEPTH	0-0'	DATE TESTED	12/29/00 DPM
SAMPLE NO.	12b-35860	WASH SIEVE	Yes
SOIL DESCR.	Proj # 085750608	DRY SIEVE	No
LOCATION	FUSRAP Maywood Superfund Site		

Hydrometer #	ASTM 152 H	Temp., Deg. C	22.5
Sp. Gr. of Soil	2.65	Temp. Coef. K	0.01325
Value of "alpha"	1.00	Wt. Dry Sample "W"	66.588
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	5.0		
Meniscus Corr'n	-1.0		

T Elapsed Time (min)	Hydrometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effective Depth L	Grain Diameter (mm)
0.0	--	--	--	--	--	--
0.5	--	--	--	--	--	--
1.0	21.00	15.00	22.5	22.5	12.85	0.0475
2.0	18.75	12.75	19.1	19.1	13.22	0.0340
5.0	16.00	10.00	15.0	15.0	13.67	0.0219
15.0	14.75	8.75	13.1	13.1	13.87	0.0127
30.0	12.75	6.75	10.1	10.1	14.20	0.0091
60.0	11.75	5.75	8.6	8.6	14.36	0.0065
120.0	11.00	5.00	7.5	7.5	14.49	0.0046
250.0	10.00	4.00	6.0	6.0	14.65	0.0032
1456.0	9.00	3.00	4.5	4.5	14.81	0.0013

Grain Diameter = K*(SQRT(L/T))

Data entered by: DPM Date: 01/16/2001
Data checked by: cm Date: 01/16/01
FileName: SOH05860

ADVANCED TERRA TESTING, INC.

MECHANICAL ANALYSIS - SIEVE TEST DATA
ASTM D 422

CLIENT	Stone & Webster	JOB NO.	2162-13
BORING NO.	PT#7	SAMPLED	10/06/00 MM
DEPTH	0-0'	DATE TESTED	12/29/00 DPM
SAMPLE NO.	12b-35862	WASH SIEVE	Yes
SOIL DESCR.	Proj # 085750608	DRY SIEVE	No
LOCATION	FUSRAP Maywood Superfund Site		

MOISTURE DATA

HYGROSCOPIC	Yes	
NATURAL	No	
Wt. Wet Soil & Pan (g)		63.65
Wt. Dry Soil & Pan (g)		62.89
Wt. Lost Moisture (g)		0.76
Wt. of Pan Only (g)		3.64
Wt. of Dry Soil (g)		59.25
Moisture Content %		1.3
Wt. Hydrom. Sample Wet (g)		59.89
Wt. Hydrom. Sample Dry (g)		59.13

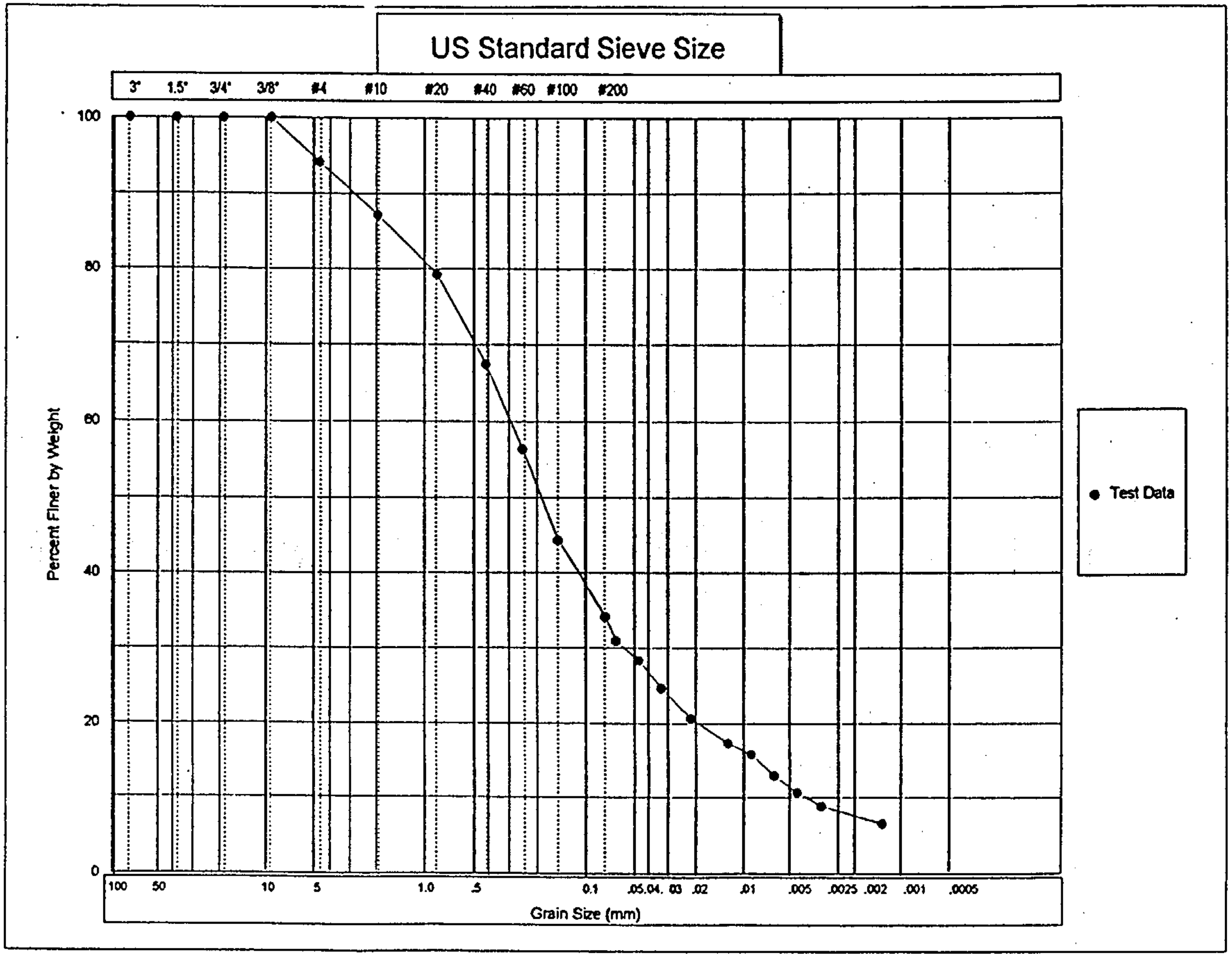
WASH SIEVE ANALYSIS

Wt. Total Sample Wet (g)	728.88
Weight of + #10 Before Washing (g)	109.21
Weight of + #10 After Washing (g)	92.66
Weight of - #10 Wet (g)	619.67
Weight of - #10 Dry (g)	628.16
Wt. Total Sample Dry (g)	720.82
Calc. Wt. "W" (g)	67.85
Calc. Mass + #10	8.72

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
3"	0.00	0.00	0.00	0.00	0.0	100.0
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	0.00	0.00	0.00	0.0	100.0
3/8"	0.00	0.00	0.00	0.00	0.0	100.0
#4	0.00	42.06	42.06	42.06	5.8	94.2
#10	0.00	50.60	50.60	92.66	12.9	87.1
#20	3.67	9.07	5.40	5.40	20.8	79.2
#40	3.57	11.49	7.92	13.32	32.5	67.5
#60	3.67	11.20	7.53	20.85	43.6	56.4
#100	3.63	11.84	8.21	29.06	55.7	44.3
#200	3.54	10.44	6.90	35.96	65.9	34.1

Data entered by: DPM/MC Date: 01/16/2001
Data checked by: cac Date: 01/16/01
FileName: SOH05862

ADVANCED TERRA TESTING, INC.



COBBLES	GRAVEL		SAND			SILT OR CLAY	USCS
	COARSE	FINE	CRS	MEDIUM	FINE		

COBBLES TO BOULDERS	PEBBLE GRAVEL				SAND			SILT	CLAY	WENTWORTH
	COARSE	MED	FINE	GRAN	COARSE	MED	FINE			

Client: Stone & Webster
Depth: 0-0'
Classification:

Boring No.: PT#7
Job Number: 2162-13

Sample No.: 12b-35862

Advanced Terra Testing, Inc.

HYDROMETER ANALYSIS - SEDIMENTATION DATA

CLIENT	Stone & Webster	JOB NO.	2162-13
BORING NO.	PT#7	SAMPLED	10/06/00 MM
DEPTH	0-0'	DATE TESTED	12/29/00 DPM
SAMPLE NO.	12b-35862	WASH SIEVE	Yes
SOIL DESCR.	Proj # 085750608	DRY SIEVE	No
LOCATION	FUSRAP Maywood Superfund Site		

Hydrometer #	ASTM 152 H	Temp., Deg. C	22.6
Sp. Gr. of Soil	2.65	Temp. Coef. K	0.01323
Value of "alpha"	1.00	Wt. Dry Sample "W"	67.852
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	5.0		
Meniscus Corr'n	-1.0		

T Elapsed Time (min)	Hydrometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effective Depth L	Grain Diameter (mm)
0.0	--	--	--	--	--	--
0.5	27.00	21.00	30.9	30.9	11.86	0.0644
1.0	25.25	19.25	28.4	28.4	12.15	0.0461
2.0	22.75	16.75	24.7	24.7	12.56	0.0332
5.0	20.00	14.00	20.6	20.6	13.01	0.0213
15.0	17.75	11.75	17.3	17.3	13.38	0.0125
30.0	16.75	10.75	15.8	15.8	13.54	0.0089
60.0	14.75	8.75	12.9	12.9	13.87	0.0064
120.0	13.25	7.25	10.7	10.7	14.12	0.0045
250.0	12.00	6.00	8.8	8.8	14.32	0.0032
1461.0	10.50	4.50	6.6	6.6	14.57	0.0013

Grain Diameter = K*(SQRT(L/T))

Data entered by: DPM/MC Date: 01/16/2001
Data checked by: CAC Date: 01/16/01
FileName: SOH05862

ADVANCED TERRA TESTING, INC.

MECHANICAL ANALYSIS - SIEVE TEST DATA
ASTM D 422

CLIENT Stone & Webster

JOB NO. 2162-13

BORING NO.	pt. # 7	SAMPLED	10/27/00
DEPTH	0' - 0'	DATE TESTED	1/11/01 DPM
SAMPLE NO.	12b-35863	WASH SIEVE	Yes
SOIL DESCR.	Proj # 085750608	DRY SIEVE	No
LOCATION	Maywood Pilot Demonstration		

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No
Wt. Wet Soil & Pan (g)	84.95
Wt. Dry Soil & Pan (g)	83.46
Wt. Lost Moisture (g)	1.49
Wt. of Pan Only (g)	3.65
Wt. of Dry Soil (g)	79.81
Moisture Content %	1.9
Wt. Hydrom. Sample Wet (g)	60.81
Wt. Hydrom. Sample Dry (g)	59.70

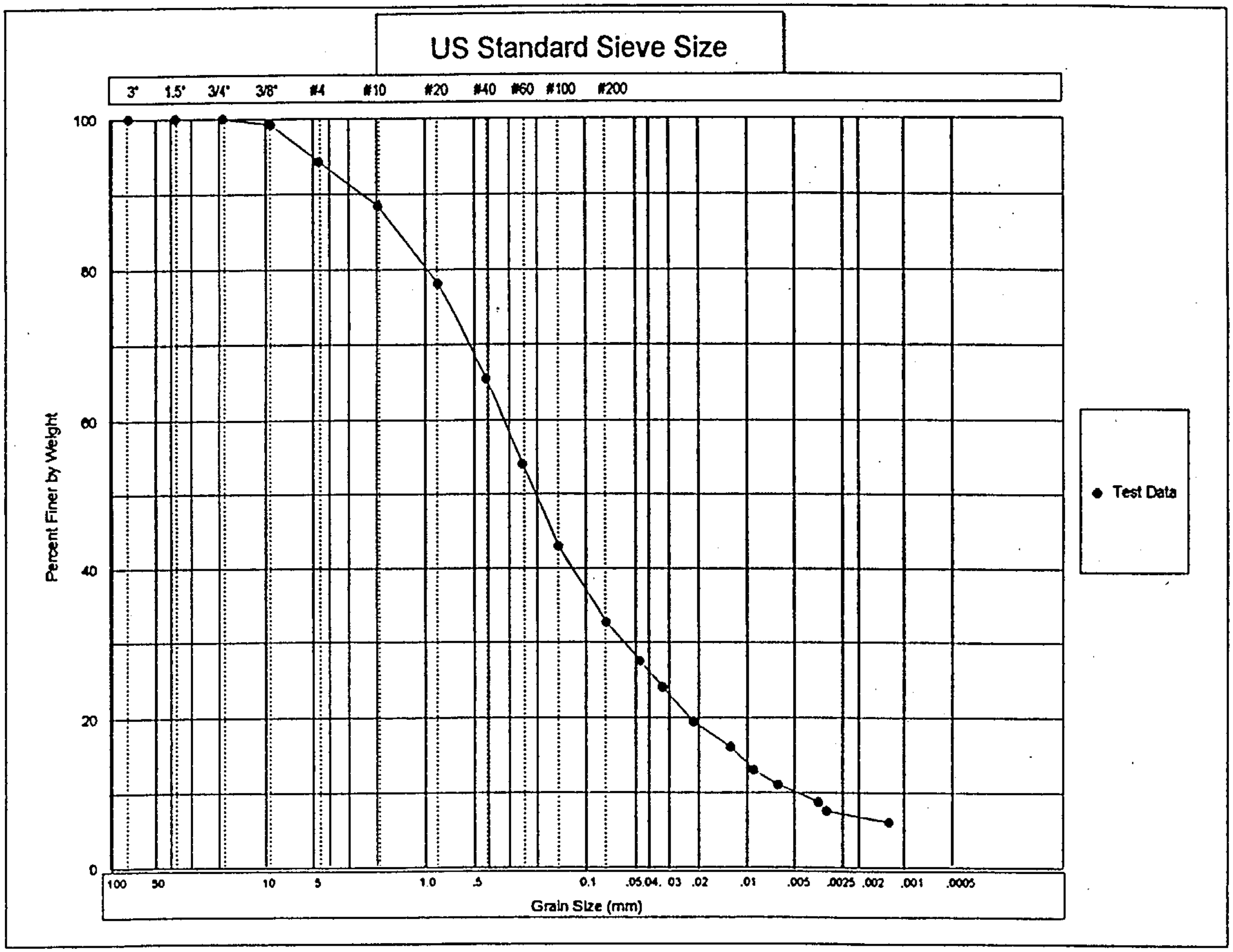
WASH SIEVE ANALYSIS

Wt. Total Sample Wet (g)	570.77
Weight of + #10 Before Washing (g)	45.00
Weight of + #10 After Washing (g)	40.61
Weight of - #10 Wet (g)	525.77
Weight of - #10 Dry (g)	520.44
Wt. Total Sample Dry (g)	561.05
Calc. Wt. "W" (g)	64.35
Calc. Mass + #10	4.66

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
3"	0.00	0.00	0.00	0.00	0.0	100.0
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	0.00	0.00	0.00	0.0	100.0
3/8"	0.00	0.00	0.00	0.00	0.0	100.0
#4	0.00	9.17	9.17	9.17	1.6	98.4
#10	0.00	31.44	31.44	40.61	7.2	92.8
#20	3.23	8.91	5.68	5.68	16.1	83.9
#40	3.68	11.24	7.56	13.24	27.8	72.2
#60	3.66	11.12	7.46	20.70	39.4	60.6
#100	3.84	12.32	8.48	29.18	52.6	47.4
#200	3.69	11.57	7.88	37.06	64.8	35.2

Data entered by: MC Date: 01/23/2001
Data checked by: [signature] Date: 1/23/01
FileName: SOH012B7

ADVANCED TERRA TESTING, INC.



COBBLES	GRAVEL		SAND			SILT OR CLAY	
	COARSE	FINE	CRS	MEDIUM	FINE		USCS

COBBLES TO BOULDERS	PEBBLE GRAVEL				SAND			SILT	CLAY	
	COARSE	MED	FINE	GRAN	COARSE	MED	FINE			WENTWORTH

Client: Stone & Webster
Depth: 0' - 0'
Classification:____________________

Boring No.: pt. # 7
Job Number: 2162-13

Sample No.: 12b-35861

Advanced Terra Testing, Inc.

HYDROMETER ANALYSIS - SEDIMENTATION DATA

CLIENT	Stone & Webster	JOB NO.	2162-13
BORING NO.	pt. # 7	SAMPLED	10/2/00 MM
DEPTH	0' - 0'	DATE TESTED	1/11/01 DPM
SAMPLE NO.	12b-35861	WASH SIEVE	Yes
SOIL DESCR.	Proj # 085750608	DRY SIEVE	No
LOCATION	Maywood Pilot Demonstration		

Hydrometer #	ASTM 152 H	Temp., Deg. C	23.1
Sp. Gr. of Soil	2.65	Temp. Coef. K	0.01315
Value of "alpha"	1.00	Wt. Dry Sample "W"	65.442
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	5.0		
Meniscus Corr'n	-1.0		

T Elapsed Time (min)	Hydrometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effective Depth L	Grain Diameter (mm)
0.0	--	--	--	--	--	--
0.5	--	--	--	--	--	--
1.0	24.00	18.00	27.5	27.5	12.35	0.0462
2.0	21.75	15.75	24.1	24.1	12.72	0.0332
5.0	18.75	12.75	19.5	19.5	13.22	0.0214
15.0	16.50	10.50	16.0	16.0	13.58	0.0125
30.0	14.50	8.50	13.0	13.0	13.91	0.0090
60.0	13.25	7.25	11.1	11.1	14.12	0.0064
194.0	11.75	5.75	8.8	8.8	14.36	0.0036
250.0	11.00	5.00	7.6	7.6	14.49	0.0032
1578.0	10.00	4.00	6.1	6.1	14.65	0.0013

Grain Diameter = K*(SQRT(L/T))

Data entered by: MC Date: 01/23/2001
Data checked by: [signature] Date: 1/23/01
FileName: SOH05861

ADVANCED TERRA TESTING, INC.

MECHANICAL ANALYSIS - SIEVE TEST DATA
ASTM D 422

CLIENT	Stone & Webster	JOB NO.	2162-13
BORING NO.	pt. # 7	SAMPLED	10/2/00 MM
DEPTH	0' - 0'	DATE TESTED	1/11/01 DPM
SAMPLE NO.	12b-35861	WASH SIEVE	Yes
SOIL DESCR.	Proj # 085750608	DRY SIEVE	No
LOCATION	Maywood Pilot Demonstration		

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No
Wt. Wet Soil & Pan (g)	65.07
Wt. Dry Soil & Pan (g)	64.43
Wt. Lost Moisture (g)	0.64
Wt. of Pan Only (g)	3.70
Wt. of Dry Soil (g)	60.73
Moisture Content %	1.1
Wt. Hydrom. Sample Wet (g)	58.49
Wt. Hydrom. Sample Dry (g)	57.88

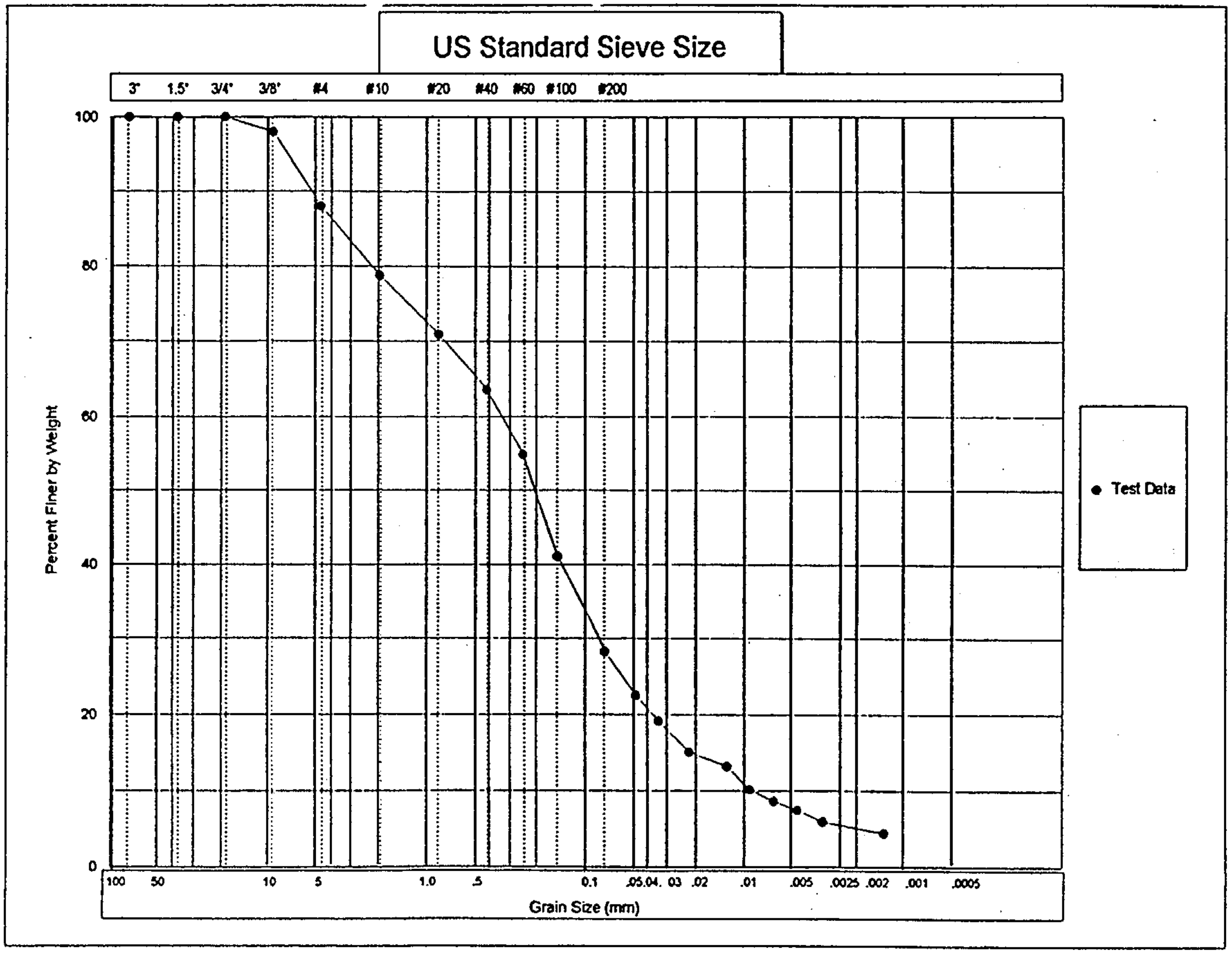
WASH SIEVE ANALYSIS

Wt. Total Sample Wet (g)	422.82
Weight of + #10 Before Washing (g)	53.17
Weight of + #10 After Washing (g)	48.42
Weight of - #10 Wet (g)	369.65
Weight of - #10 Dry (g)	370.50
Wt. Total Sample Dry (g)	418.92
Calc. Wt. "W" (g)	65.44
Calc. Mass + #10	7.56

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
3"	0.00	0.00	0.00	0.00	0.0	100.0
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	0.00	0.00	0.00	0.0	100.0
3/8"	0.00	3.19	3.19	3.19	0.8	99.2
#4	0.00	20.62	20.62	23.81	5.7	94.3
#10	0.00	24.61	24.61	48.42	11.6	88.4
#20	3.76	10.55	6.79	6.79	21.9	78.1
#40	3.57	11.79	8.22	15.01	34.5	65.5
#60	3.57	11.07	7.50	22.51	46.0	54.0
#100	3.72	10.94	7.22	29.73	57.0	43.0
#200	3.64	10.35	6.71	36.44	67.2	32.8

Data entered by: MC Date: 01/23/2001
Data checked by: [signature] Date: 1/23/01
FileName: SOH05861

ADVANCED TERRA TESTING, INC.



COBBLES	GRAVEL		SAND			SILT OR CLAY	USCS
	COARSE	FINE	CRS	MEDIUM	FINE		

COBBLES TO BOULDERS	PEBBLE GRAVEL				SAND			SILT	CLAY	WENTWORTH
	COARSE	MED	FINE	GRAN	COARSE	MED	FINE			

Client: Stone & Webster
Depth: 0-0'
Classification: ______________

Boring No.: PT#7
Job Number: 2162-13

Sample No.: 12b-35860

Advanced Terra Testing, Inc.

HYDROMETER ANALYSIS - SEDIMENTATION DATA

CLIENT Stone & Webster

JOB NO. 2162-13

BORING NO.	pt. # 7	SAMPLED	10/27/00
DEPTH	0' - 0'	DATE TESTED	1/11/01 DPM
SAMPLE NO.	12b-35863	WASH SIEVE	Yes
SOIL DESCR.	Proj # 085750608	DRY SIEVE	No
LOCATION	Maywood Pilot Demonstration		

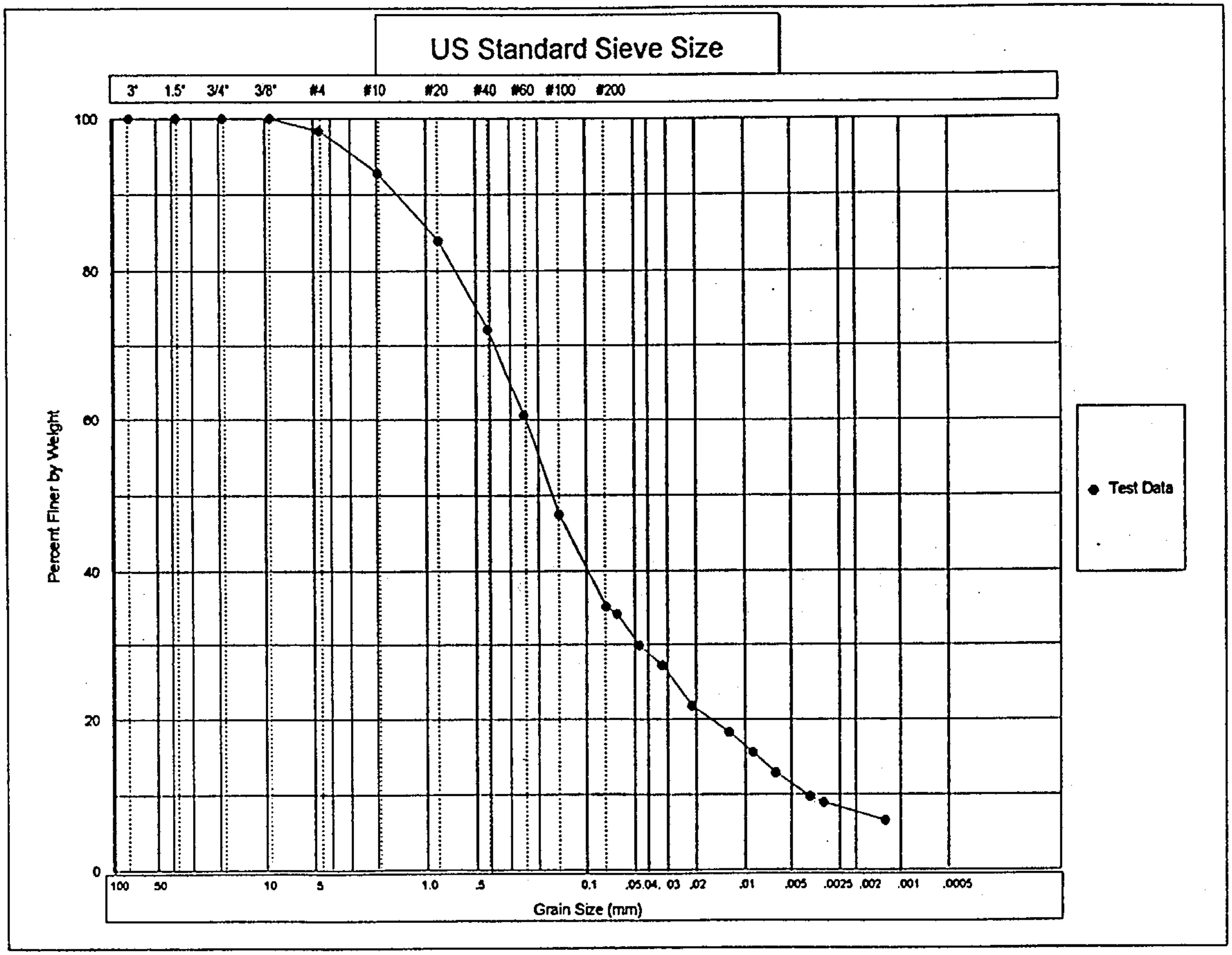
Hydrometer #	ASTM 152 H	Temp., Deg. C	23.2
Sp. Gr. of Soil	2.65	Temp. Coef. K	0.01314
Value of "alpha"	1.00	Wt. Dry Sample "W"	64.354
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	5.0		
Meniscus Corr'n	-1.0		

T Elapsed Time (min)	Hydrometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effective Depth L	Grain Diameter (mm)
0.0	--	--	--	--	--	--
0.5	28.00	22.00	34.2	34.2	11.70	0.0635
1.0	25.25	19.25	29.9	29.9	12.15	0.0458
2.0	23.50	17.50	27.2	27.2	12.44	0.0328
5.0	20.00	14.00	21.8	21.8	13.01	0.0212
15.0	17.75	11.75	18.3	18.3	13.38	0.0124
30.0	16.00	10.00	15.5	15.5	13.67	0.0089
60.0	14.25	8.25	12.8	12.8	13.95	0.0063
167.0	12.25	6.25	9.7	9.7	14.28	0.0038
250.0	11.75	5.75	8.9	8.9	14.36	0.0031
1554.0	10.25	4.25	6.6	6.6	14.61	0.0013

Grain Diameter = K*(SQRT(L/T))

Data entered by: MC Date: 01/23/2001
Data checked by: [signature] Date: 1/23/01
FileName: SOH012B7

ADVANCED TERRA TESTING, INC.



COBBLES	GRAVEL		SAND			SILT OR CLAY	
	COARSE	FINE	CRS	MEDIUM	FINE		USCS

COBBLES	PEBBLE GRAVEL				SAND			SILT	CLAY	
TO BOULDERS	COARSE	MED	FINE	GRAN	COARSE	MED	FINE			WENTWORTH

Client: Stone & Webster
Depth: 0' - 0'
Classification:____________________

Boring No.: pt. # 7
Job Number: 2162-13

Sample No.: 12b-35863

Advanced Terra Testing, Inc.

MECHANICAL ANALYSIS - SIEVE TEST DATA
ASTM D 422

CLIENT Stone & Webster

JOB NO. 2162-14

BORING NO.	Rinse -H2O - 1	SAMPLED	11/8/00 BM
DEPTH		DATE TESTED	1/25/01 MC
SAMPLE NO.	12b-035869	WASH SIEVE	Yes
SOIL DESCR.	Proj # 085750608	DRY SIEVE	No
LOCATION	Maywood Pilot Demonstration		

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No
Wt. Wet Soil & Pan (g)	8.00
Wt. Dry Soil & Pan (g)	7.91
Wt. Lost Moisture (g)	0.09
Wt. of Pan Only (g)	0.97
Wt. of Dry Soil (g)	6.94
Moisture Content %	1.3
Wt. Hydrom. Sample Wet (g)	24.86
Wt. Hydrom. Sample Dry (g)	24.55

WASH SIEVE ANALYSIS

Wt. Total Sample Wet (g)	31.91
Weight of + #10 Before Washing (g)	0.00
Weight of + #10 After Washing (g)	0.00
Weight of - #10 Wet (g)	31.91
Weight of - #10 Dry (g)	31.50
Wt. Total Sample Dry (g)	31.50
Calc. Wt. "W" (g)	24.55
Calc. Mass + #10	0.00

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
3"	0.00	0.00	0.00	0.00	0.0	100.0
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	0.00	0.00	0.00	0.0	100.0
3/8"	0.00	0.00	0.00	0.00	0.0	100.0
#4	0.00	0.00	0.00	0.00	0.0	100.0
#10	0.00	0.00	0.00	0.00	0.0	100.0
#20	3.68	3.74	0.06	0.06	0.2	99.8
#40	3.68	4.09	0.41	0.47	1.9	98.1
#60	3.71	5.27	1.56	2.03	8.3	91.7
#100	3.71	7.29	3.58	5.61	22.9	77.1
#200	3.58	7.75	4.17	9.78	39.8	60.2

Data entered by: MC Date: 01/29/2001
Data checked by: CK Date: 01/30/01
FileName: SOH0RHO1

ADVANCED TERRA TESTING, INC.

HYDROMETER ANALYSIS - SEDIMENTATION DATA

CLIENT	Stone & Webster	JOB NO.	2162-14
BORING NO.	Rinse -H2O - 1	SAMPLED	11/8/00 BM
DEPTH		DATE TESTED	1/25/01 MC
SAMPLE NO.	12b-035869	WASH SIEVE	Yes
SOIL DESCR.	Proj # 085750608	DRY SIEVE	No
LOCATION	Maywood Pilot Demonstration		

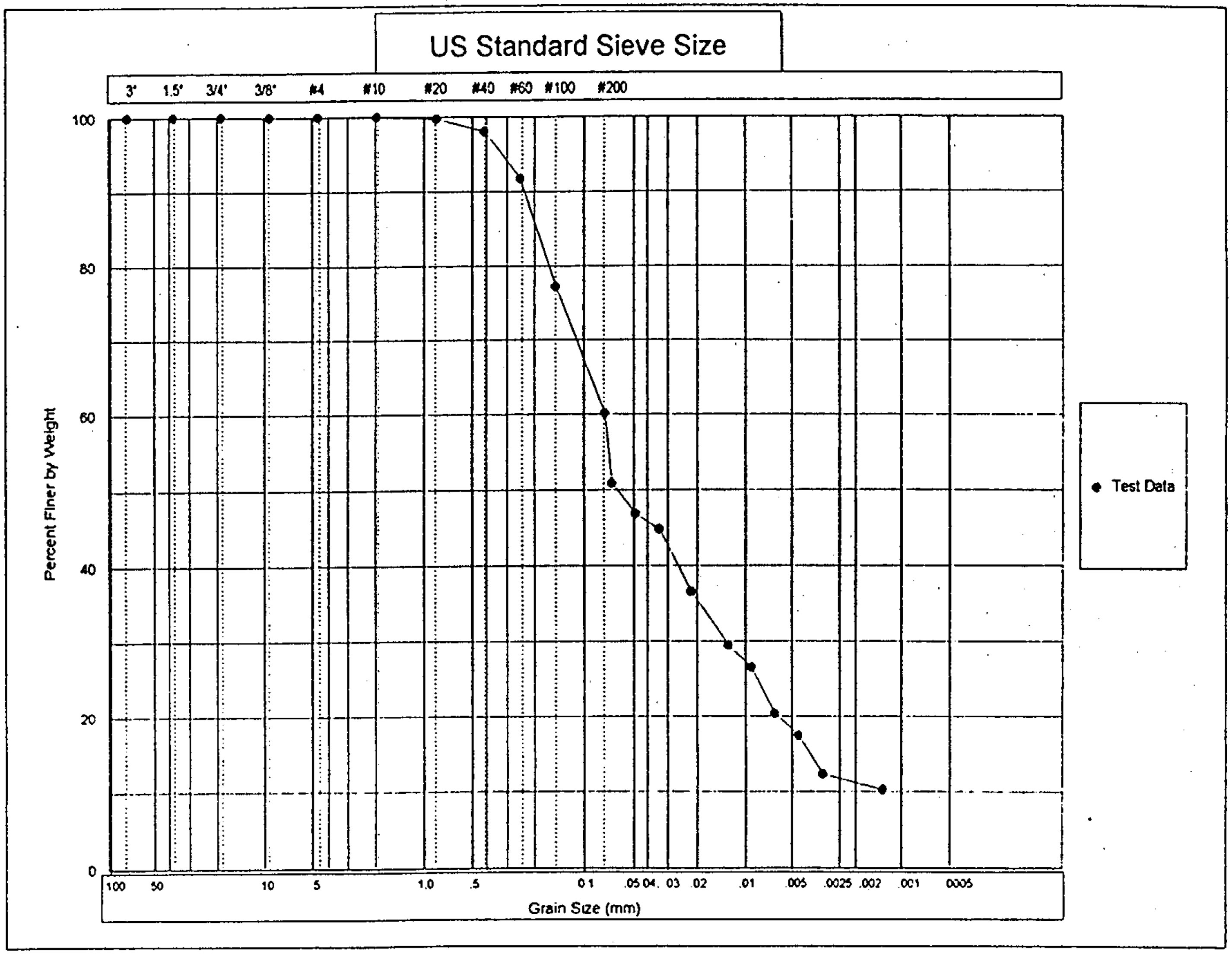
Hydrometer #	ASTM 152 H	Temp., Deg. C	23.3
Sp. Gr. of Soil	2.65	Temp. Coef. K	0.01312
Value of "alpha"	1.00	Wt. Dry Sample "W"	24.546
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	4.0		
Meniscus Corr'n	-2.0		

T Elapsed Time (min)	Hydrometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effective Depth L	Grain Diameter (mm)
0.0	--	--	--	--	--	--
0.5	18.50	12.50	50.9	50.9	13.26	0.0676
1.0	17.50	11.50	46.9	46.9	13.42	0.0481
2.0	17.00	11.00	44.8	44.8	13.50	0.0341
5.0	15.00	9.00	36.7	36.7	13.83	0.0218
15.0	13.25	7.25	29.5	29.5	14.12	0.0127
30.0	12.50	6.50	26.5	26.5	14.24	0.0090
60.0	11.00	5.00	20.4	20.4	14.49	0.0064
120.0	10.25	4.25	17.3	17.3	14.61	0.0046
250.0	9.00	3.00	12.2	12.2	14.81	0.0032
1425.0	8.50	2.50	10.2	10.2	14.90	0.0013

Grain Diameter = K*(SQRT(L/T))

Data entered by: MC Date: 01/29/2001
Data checked by: MC Date: 01/30/01
FileName: SOH0RHO1

ADVANCED TERRA TESTING, INC.



COBBLES	GRAVEL		SAND			SILT OR CLAY	USCS
	COARSE	FINE	CRS	MEDIUM	FINE		

COBBLES TO BOULDERS	PEBBLE GRAVEL				SAND			SILT	CLAY	WENTWORTH
	COARSE	MED	FINE	GRAN	COARSE	MED	FINE			

Client: Stone & Webster
Depth:
Classification:______________

Boring No : Rinse -H2O - 1
Job Number: 2162-14

Sample No : 12b-035869

Advanced Terra Testing, Inc.

MECHANICAL ANALYSIS - SIEVE TEST DATA
ASTM D 422

CLIENT	Stone & Webster	JOB NO.	2162-14
BORING NO.	Rinse -H2O - 2	SAMPLED	11/13/00 BM
DEPTH		DATE TESTED	1/25/01 MC
SAMPLE NO.	12b-035870	WASH SIEVE	Yes
SOIL DESCR.	Proj # 085750608	DRY SIEVE	No
LOCATION	Maywood Pilot Demonstration		

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No
Wt. Wet Soil & Pan (g)	10.21
Wt. Dry Soil & Pan (g)	10.04
Wt. Lost Moisture (g)	0.17
Wt. of Pan Only (g)	2.34
Wt. of Dry Soil (g)	7.70
Moisture Content %	2.2
Wt. Hydrom. Sample Wet (g)	35.54
Wt. Hydrom. Sample Dry (g)	34.77

WASH SIEVE ANALYSIS

Wt. Total Sample Wet (g)	43.49
Weight of + #10 Before Washing (g)	0.00
Weight of + #10 After Washing (g)	0.00
Weight of - #10 Wet (g)	43.49
Weight of - #10 Dry (g)	42.55
Wt. Total Sample Dry (g)	42.55
Calc. Wt. "W" (g)	34.77
Calc. Mass + #10	0.00

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
3"	0.00	0.00	0.00	0.00	0.0	100.0
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	0.00	0.00	0.00	0.0	100.0
3/8"	0.00	0.00	0.00	0.00	0.0	100.0
#4	0.00	0.00	0.00	0.00	0.0	100.0
#10	0.00	0.00	0.00	0.00	0.0	100.0
#20	3.63	3.64	0.01	0.01	0.0	100.0
#40	3.60	3.60	0.00	0.01	0.0	100.0
#60	3.66	3.67	0.01	0.02	0.1	99.9
#100	3.66	3.70	0.04	0.06	0.2	99.8
#200	3.71	3.89	0.18	0.24	0.7	99.3

Data entered by: MC Date: 01/29/2001
Data checked by: ac Date: 01/30/01
FileName: SOH0RHO2

ADVANCED TERRA TESTING, INC.

HYDROMETER ANALYSIS - SEDIMENTATION DATA

CLIENT	Stone & Webster		JOB NO.	2162-14
BORING NO.	Rinse -H2O - 2		SAMPLED	11/13/00 BM
DEPTH			DATE TESTED	1/25/01 MC
SAMPLE NO.	12b-035870		WASH SIEVE	Yes
SOIL DESCR.	Proj # 085750608		DRY SIEVE	No
LOCATION	Maywood Pilot Demonstration			

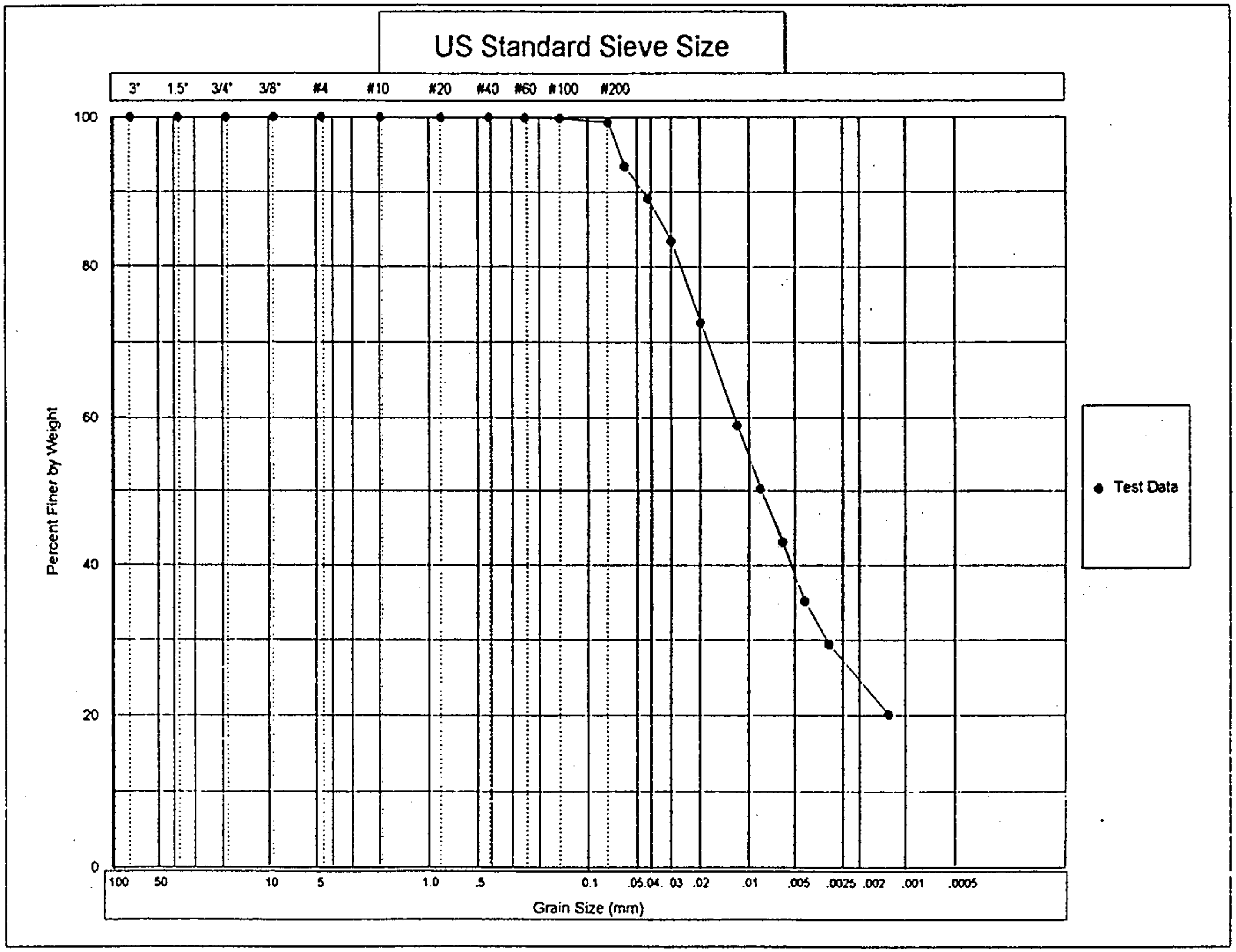
Hydrometer #	ASTM 152 H		Temp., Deg. C	23.5
Sp. Gr. of Soil	2.65		Temp. Coef. K	0.01309
Value of "alpha"	1.00		Wt. Dry Sample "W"	34.773
Deflocculant	Sodium Hexametaphosphate		% of Total Sample	100.0
Defloc. Corr'n	4.0			
Meniscus Corr'n	-2.0			

T Elapsed Time (min)	Hydrometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effective Depth L	Grain Diameter (mm)
0.0	--	--	--	--	--	--
0.5	38.50	32.50	93.5	93.5	9.98	0.0585
1.0	37.00	31.00	89.1	89.1	10.22	0.0419
2.0	35.00	29.00	83.4	83.4	10.55	0.0301
5.0	31.25	25.25	72.6	72.6	11.17	0.0196
15.0	26.50	20.50	59.0	59.0	11.94	0.0117
30.0	23.50	17.50	50.3	50.3	12.44	0.0084
60.0	21.00	15.00	43.1	43.1	12.85	0.0061
120.0	18.25	12.25	35.2	35.2	13.30	0.0044
250.0	16.25	10.25	29.5	29.5	13.63	0.0031
1433.0	13.00	7.00	20.1	20.1	14.16	0.0013

Grain Diameter = K*(SQRT(L/T))

Data entered by: MC Date: 01/29/2001
Data checked by: *ok* Date: *01/30/01*
FileName: SOH0RHO2

ADVANCED TERRA TESTING, INC.



COBBLES	GRAVEL		SAND			SILT OR CLAY	
	COARSE	FINE	CRS	MEDIUM	FINE		USCS

COBBLES TO BOULDERS	PEBBLE GRAVEL				SAND			SILT	CLAY	
	COARSE	MED	FINE	GRAN	COARSE	MED	FINE			WENTWORTH

Client: Stone & Webster
Depth:
Classification:________________

Boring No : Rinse -H2O - 2
Job Number: 2162-14

Sample No.: 12b-035870

Advanced Terra Testing, Inc.

MECHANICAL ANALYSIS - SIEVE TEST DATA
ASTM D 422

CLIENT	Stone & Webster	JOB NO.	2162-14
BORING NO.	Rinse -H2O - 3	SAMPLED	11/13/00 BM
DEPTH		DATE TESTED	1/25/01 MC
SAMPLE NO.	12b-035871	WASH SIEVE	Yes
SOIL DESCR.	Proj # 085750608	DRY SIEVE	No
LOCATION	Maywood Pilot Demonstration		

MOISTURE DATA

HYGROSCOPIC	Yes
NATURAL	No
Wt. Wet Soil & Pan (g)	14.26
Wt. Dry Soil & Pan (g)	14.08
Wt. Lost Moisture (g)	0.18
Wt. of Pan Only (g)	2.29
Wt. of Dry Soil (g)	11.79
Moisture Content %	1.5
Wt. Hydrom. Sample Wet (g)	58.14
Wt. Hydrom. Sample Dry (g)	57.26

WASH SIEVE ANALYSIS

Wt. Total Sample Wet (g)	70.20
Weight of + #10 Before Washing (g)	0.00
Weight of + #10 After Washing (g)	0.00
Weight of - #10 Wet (g)	70.20
Weight of - #10 Dry (g)	69.14
Wt. Total Sample Dry (g)	69.14
Calc. Wt. "W" (g)	57.26
Calc. Mass + #10	0.00

Sieve Number (Size)	Pan Weight (g)	Indiv. Wt. + Pan (g)	Indiv. Wt. Retain.	Cum. Wt. Retain.	Cum. % Retain.	% Finer By Wt.
3"	0.00	0.00	0.00	0.00	0.0	100.0
1 1/2"	0.00	0.00	0.00	0.00	0.0	100.0
3/4"	0.00	0.00	0.00	0.00	0.0	100.0
3/8"	0.00	0.00	0.00	0.00	0.0	100.0
#4	0.00	0.00	0.00	0.00	0.0	100.0
#10	0.00	0.00	0.00	0.00	0.0	100.0
#20	3.61	3.62	0.01	0.01	0.0	100.0
#40	3.67	3.68	0.01	0.02	0.0	100.0
#60	3.63	3.77	0.14	0.16	0.3	99.7
#100	4.03	6.38	2.35	2.51	4.4	95.6
#200	3.71	12.19	8.48	10.99	19.2	80.8

Data entered by: MC Date: 01/29/2001
Data checked by: CM Date: 1/30/01
FileName: SOH0RHO3

ADVANCED TERRA TESTING, INC.

HYDROMETER ANALYSIS - SEDIMENTATION DATA

CLIENT Stone & Webster

JOB NO. 2162-14

BORING NO.	Rinse -H2O - 3	SAMPLED	11/13/00 BM
DEPTH		DATE TESTED	1/25/01 MC
SAMPLE NO.	12b-035871	WASH SIEVE	Yes
SOIL DESCR.	Proj # 085750608	DRY SIEVE	No
LOCATION	Maywood Pilot Demonstration		

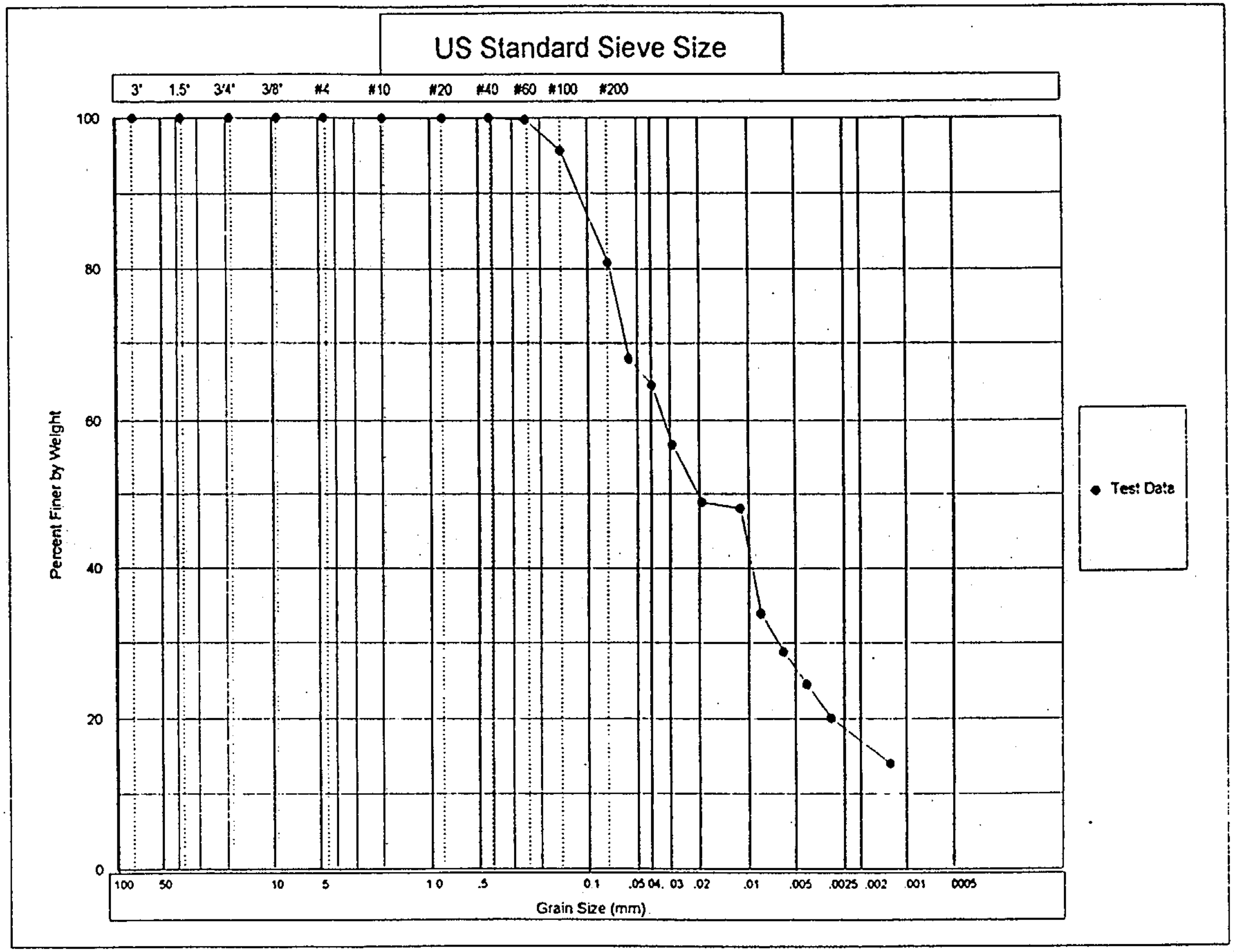
Hydrometer #	ASTM 152 H	Temp., Deg. C	23.6
Sp. Gr. of Soil	2.65	Temp. Coef. K	0.01307
Value of "alpha"	1.00	Wt. Dry Sample "W"	57.264
Deflocculant	Sodium Hexametaphosphate	% of Total Sample	100.0
Defloc. Corr'n	4.0		
Meniscus Corr'n	-2.0		

T Elapsed Time (min)	Hydrometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Effective Depth L	Grain Diameter (mm)
0.0	--	--	--	--	--	--
0.5	45.00	39.00	68.1	68.1	8.91	0.0552
1.0	43.00	37.00	64.6	64.6	9.24	0.0397
2.0	38.50	32.50	56.8	56.8	9.98	0.0292
5.0	34.00	28.00	48.9	48.9	10.71	0.0191
15.0	33.50	27.50	48.0	48.0	10.80	0.0111
30.0	25.50	19.50	34.1	34.1	12.11	0.0083
60.0	22.50	16.50	28.8	28.8	12.60	0.0060
120.0	20.00	14.00	24.4	24.4	13.01	0.0043
250.0	17.50	11.50	20.1	20.1	13.42	0.0030
1437.0	14.00	8.00	14.0	14.0	13.99	0.0013

Grain Diameter = K*(SQRT(L/T))

Data entered by: MC Date: 01/29/2001
Data checked by: MC Date: 01/30/01
FileName: SOH0RHO3

ADVANCED TERRA TESTING, INC.



COBBLES	GRAVEL		SAND			SILT OR CLAY	USCS
	COARSE	FINE	CRS	MEDIUM	FINE		

COBBLES TO BOULDERS	PEBBLE GRAVEL				SAND			SILT	CLAY	WENTWORTH
	COARSE	MED	FINE	GRAN	COARSE	MED	FINE			

Client: Stone & Webster　　Boring No.: Rinse -H2O - 3　　Sample No.: 12b-035871
Depth:　　Job Number: 2162-14
Classification: ____________________

Advanced Terra Testing, Inc.

PERCENT SOLIDS

Percent Solids

Client: Stone & Webster
Location: Maywood Pilot Demonstration

Job No.: 2162-14
Project No.: 085750608

Sample Name	Sample No.	Date Sampled	% Solids
Rinse H_2O - 1	12b-035869	11-8-00 BM	4.93%
Rinse H_2O - 2	12b-035870	11-13-00 BM	5.42%
Rinse H_2O - 3	12b-035871	11-13-00 BM	7.33%

Data Entered By: SR Date: 1-30-01
Data Checked By: KR Date: 2-1-01
Filename: K:/SO2162/SOPSH2O.lwp

ADVANCED TERRA TESTING, inc

POST TEST RADIOLOGICAL SCREENING DATA

Post Test Radiological Screening Data

CLIENT Stone & Webster | JOB NO. 2162-13

BORING NO. PT# 7 | DATE SAMPLED 9-14-00
DEPTH 0-0 | DATE SCREENED 2-26-01 KF
SAMPLE NO. 12b-35860
SOIL DESCR. FUSRAP Maywood Superfund Site; Proj# 085750608

Alpha Background (CPM) : 6 | Beta/Gamma Background (CPM) : 80

Sieve Fractions	Gross Alpha (CPM)	Gross Alpha (DPM) [CPM-BG*2.8]	Gross Beta/Gamma (CPM)	Gross Beta/Gamma (DPM) [CPM-BG*310]	Remarks
-3" to +1.5"	-	0	-	0	
-1.5" to +3/4"	-	0	-	0	
-3/4" to +3/8"	2	0	75	0	
-3/8" to +#4	6	0	95	4650	
- #4 to +#10	8	6	90	3100	
- #10 to +#20	6	0	85	1550	
- #20 to +#40	2	0	80	0	
- #40 to +#60	4	0	75	0	
- #60 to +#100	6	0	85	1550	
- #100 to +#200	8	6	90	3100	

Data entry by: KF Date: 02/27/2001
Checked by: DPM Date: 02/27/01
FileName: SORS860

ADVANCED TERRA TESTING, INC.

Post Test Radiological Screening Data

CLIENT Stone & Webster | JOB NO. 2162-13

BORING NO. PT# 7 | DATE SAMPLED 10-2-00
DEPTH 0-0 | DATE SCREENED 2-26-01 KF
SAMPLE NO. 12b-35861
SOIL DESCR. FUSRAP Maywood Superfund Site; Proj# 085750608

Alpha Background (CPM) : 6 | Beta/Gamma Background (CPM) : 80

Sieve Fractions	Gross Alpha (CPM)	Gross Alpha (DPM) [CPM-BG*2.8]	Gross Beta/Gamma (CPM)	Gross Beta/Gamma (DPM) [CPM-BG*310]	Remarks
-3" to +1.5"	-	0	-	0	
-1.5" to +3/4"	-	0	-	0	
-3/4" to +3/8"	6	0	90	3100	
-3/8" to +#4	8	6	110	9300	
- #4 to +#10	6	0	90	3100	
- #10 to +#20	4	0	100	6200	
- #20 to +#40	2	0	95	4650	
- #40 to +#60	2	0	80	0	
- #60 to +#100	2	0	90	3100	
- #100 to +#200	4	0	130	15500	

Data entry by: KF Date: 02/27/2001
Checked by: KR Date: 3/02/2001
FileName: SORS861

ADVANCED TERRA TESTING, INC.

Post Test Radiological Screening Data

CLIENT Stone & Webster | JOB NO. 2162-13

BORING NO. PT# 7 | DATE SAMPLED 10-6-00
DEPTH 0-0 | DATE SCREENED 2-26-01 KF
SAMPLE NO. 12b-35862
SOIL DESCR. FUSRAP Maywood Superfund Site; Proj# 085750608

Alpha Background (CPM) : 6 | Beta/Gamma Background (CPM) : 80

Sieve Fractions	Gross Alpha (CPM)	Gross Alpha (DPM) [CPM-BG*2.8]	Gross Beta/Gamma (CPM)	Gross Beta/Gamma (DPM) [CPM-BG*310]	Remarks
-3" to +1.5"	-	0	-	0	
-1.5" to +3/4"	-	0	-	0	
-3/4" to +3/8"	-	0	-	0	
-3/8" to +#4	7	3	105	7750	
- #4 to +#10	8	6	110	9300	
- #10 to +#20	8	6	110	9300	
- #20 to +#40	4	0	90	3100	
- #30 to +#60	4	0	85	1550	
- #60 to +#100	2	0	80	0	
- #100 to +#200	4	0	95	4650	

Data entry by: KF Date: 02/27/2001
Checked by: DPM Date: 02/27/01
FileName: SORS862

ADVANCED TERRA TESTING, INC.

Post Test Radiological Screening Data

CLIENT	Stone & Webster	JOB NO.	2162-13
BORING NO.	PT# 7	DATE SAMPLED	10-27-00
DEPTH	0-0	DATE SCREENED	2-26-01 KF
SAMPLE NO.	12b-35863		
SOIL DESCR.	FUSRAP Maywood Superfund Site; Proj# 085750608		

Alpha Background (CPM) : 6 Beta/Gamma Background (CPM) : 80

Sieve Fractions	Gross Alpha (CPM)	Gross Alpha (DPM) [CPM-BG*2.8]	Gross Beta/Gamma (CPM)	Gross Beta/Gamma (DPM) [CPM-BG*310]	Remarks
-3" to +1.5"	-	0	-	0	
-1.5" to +3/4"	-	0	-	0	
-3/4" to +3/8"	-	0	-	0	
-3/8" to +#4	2	0	75	0	
- #4 to +#10	12	17	90	3100	
- #10 to +#20	4	0	90	3100	
- #120 to +#40	4	0	95	4650	
- #40 to +#60	2	0	80	0	
- #60 to +#100	2	0	100	6200	
- #100 to +#200	6	0	110	9300	

Data entry by: KF Date: 02/27/2001
Checked by: DPM Date: 2-27-01
FileName: SORS863

ADVANCED TERRA TESTING, INC.

RAW DATA

ADVANCED TERRA TESTING, INC.

COMBINED MECHANICAL ANALYSIS FORM ASTM D 422

ATT/TP-(REV____

Client: STONE + WEBSTER	Job No. 2162-13		
Boring No. PT#7	Sample Date 9/14/00	by MM	
Depth 0-0'	Date Prepped 12/20/00	by MM	
Sample No. 12b-35860	Date Tested 12/29/00	by DPM	
Location Maywood Pilot Demonstration	Date Washed 01/03/01	by DLC	
Soil Description Proj# 085750608	Thermometer No. 729	Oven No.	

HYGROSCOPIC MOISTURE DETERMINATION Scale Id. L

Wt. of Wet Soil & Pan	93.08
Wt. of Dry Soil & Pan	86.94
Wt. of Water	
Wt. of Pan No. LITER	3.65
Wt. of Dry Soil	
Moisture Content, %	

TEST CONTENTS

Hydrometer No.	
Specific Gravity Calculated? yes☐ no☒	2.65
Value of "a"	
Deflocculant	cc. of
Deflocculant Correction	5.0
Meniscus Correction	-1

SIEVE ANALYSIS Scale Id. L

Wt. of Total Sample (wet)	
Wt. of Total Sample (dry)	
Wt. of + #10 (wet), Pan No. 958	128.14
Wt. of + #10 (dry)	
Wt. of - #10 (wet)	418.51
Wt. of - #10 (dry)	

Temperature, °C	22.5
Temperature Correction Coefficient k	.013245

Wt. of Dry Sample "W"	
% of Total Sample	

Tyler Sieve Size	Dry Soil Retained	Scale Id.	Cum.Wt. Dry Soil Retained	% Finer Than	% Total Sample
3"	—				
1 1/2"	—				
3/4"	—				
3/8"	10.20	L			
#4	51.28	L			
#10	47.69	L			

AFTER HYDROMETER ANALYSIS Scale Id. ____

Tyler Sieve Size	Pan No.	Pan Wt.	Dry Soil & Pan	Cum. Wt. Dry Soil Retained	% Finer Than	% Total Sample
#20	QATO	3.76	8.99			
#40	Roast	3.65	8.49			
#60	115	3.59	9.30			
#100	CH8	3.86	12.99			
#200	KE	3.60	12.16			

HYDROMETER ANALYSIS B

Wt. of Wet Sample (Passing - #10 sieve) 56.320 | Wt. of Dry Sample (Passing - #10 sieve)

Observed Time	Elapsed Time (min.)	Temp (°C)	Hydrometer Reading Original	Hydrometer Reading Corrected "R"	100Ra/W	% Total Sample	Grain Diameter (mm)	Correction Coef L	Correction Coef k	Correction Coef s	Corrected Diameter (mm)
11 11	0		----	----	----	----	----	--	----	--	----
	1/2		—								
1112	1	22.9	21								
1113	2	22.9	18.75								
1116	5	22.9	16.0								
1126	15	22.8	14.75								
1141	30	22.8	12.75								
1211	60	22.7	11.75								
1311	120	22.5	11.00								
1521	250	22.2	10.0								
12-30-2000 1127	1456	20.8	9.0								

j:\forms\combined.sam/3-96/pm Retain Individual Screens

ADVANCED TERRA TESTING, INC.

COMBINED MECHANICAL ANALYSIS FORM ASTM D 422

ATT/TP-0
REV

Client STONE + VEBSTER
Boring No. P+ #7
Depth 0-0'
Sample No. 12b-35861
Location Maywood Pilot Demonstration
Soil Description Proj #08575060 8

Job No. 2162-13
Sample Date 10/2/00 by MM
Date Prepped ~~08/0/00~~ 01/08/01 by MM
Date Tested 01/11/01 by DPM
Date Washed 1/16/01 by
Thermometer No. 0729
Oven No.

HYGROSCOPIC MOISTURE DETERMINATION Scale Id. C

Wt. of Wet Soil & Pan	65.07
Wt. of Dry Soil & Pan	64.43
Wt. of Water	
Wt. of Pan No. 43	mm ~~3.6~~ 3.70
Wt. of Dry Soil	
Moisture Content, %	

TEST CONTENTS

Hydrometer No.	
Specific Gravity Calculated? yes☐ no☐	
Value of "a"	
Deflocculant	cc. of
Deflocculant Correction	5.0
Meniscus Correction	-1

SIEVE ANALYSIS Scale Id. C

Wt. of Total Sample (wet)	
Wt. of Total Sample (dry)	
Wt. of + #10 (wet), Pan No. Death	53.17
Wt. of + #10 (dry)	
Wt. of - #10 (wet)	369.65
Wt. of - #10 (dry)	

Temperature, °C	23.08
Temperature Correction Coefficient k	.013154

Wt. of Dry Sample "W"	
% of Total Sample	

Tyler Sieve Size	Dry Soil Retained	Scale Id.	Cum.Wt. Dry Soil Retained	% Finer Than	% Total Sample
3"	—				
1 1/2"	—				
3/4"	—				
3/8"	3.19				
#4	20.62				
#10	24.61				

AFTER HYDROMETER ANALYSIS Scale Id. C

Tyler Sieve Size	Pan No.	Pan Wt.	Dry Soil & Pan	Cum. Wt. Dry Soil Retained	% Finer Than	% Total Sample
#20	RH11	3.76	10.55			
#40	WILL	3.57	11.79			
#60	U13	3.57	11.07			
#100	D4	3.72	~~10.85~~ 10.94			
#200	DARD	3.64	10.35			

HYDROMETER ANALYSIS B

Wt. of Wet Sample (Passing - #10 sieve) 58.488
Wt. of Dry Sample (Passing - #10 sieve)

Observed Time	Elapsed Time (min.)	Temp (°C)	Hydrometer Reading Original	Hydrometer Reading Corrected "R"	100Ra / W	% Total Sample	Grain Diameter (mm)	Correction Coef L	Correction Coef k	Correction Coef s	Corrected Diameter (mm)
1334	0		----	----	----	----	----	--	----	--	----
	1/2		—								
1335	1	23.2	24								
1336	2	23.2	21.75								
1339	5	23.2	18.75								
1349	15	23.2	16.5								
1404	30	23.2	14.5								
1434	60	23.2	13.25								
16.8 ~~1534~~	~~120~~ 154	23.1	11.75								
1744	250	23.1	11.0								
1552 ~~22 34~~	1578	23.3	10.0								

Normal (Screened out) Radioactive

ADVANCED TERRA TESTING, INC.
COMBINED MECHANICAL ANALYSIS FORM ASTM D 422

ATT/TP-0
REV___

Client	STONE + WEBSTER	Job No.	2162-13
Boring No.	PT#7	Sample Date	10/6/00 by
Depth	0-6'	Date Prepped	12/20/00 by
Sample No.	12b-35862	Date Tested	12/29/00 by
Location	Maywood Pilot Demonstration	Date Washed	01/03/01 by WSB
Soil Description	Proj # 085750608	Thermometer No.	729 Oven No.

HYGROSCOPIC MOISTURE DETERMINATION Scale Id. L

Wt. of Wet Soil & Pan	63.65
Wt. of Dry Soil & Pan	62.89
Wt. of Water	
Wt. of Pan No. JOE	3.64
Wt. of Dry Soil	
Moisture Content, %	

TEST CONTENTS

Hydrometer No.	
Specific Gravity Calculated? yes☐ no☒	2.65
Value of "a"	
Deflocculant	cc. of
Deflocculant Correction	5.0
Meniscus Correction	-1

Temperature, °C	22.6
Temperature Correction Coefficient k	.013236

Wt. of Dry Sample "W"	
% of Total Sample	

SIEVE ANALYSIS Scale Id. L

Wt. of Total Sample (wet)	
Wt. of Total Sample (dry)	
Wt. of + #10 (wet), Pan No. Death	109.21
Wt. of + #10 (dry)	
Wt. of - #10 (wet)	619.67
Wt. of - #10 (dry)	

Tyler Sieve Size	Dry Soil Retained	Scale Id.	Cum. Wt. Dry Soil Retained	% Finer Than	% Total Sample
3"	—				
1 1/2"	—				
3/4"	—				
3/8"					
#4	42.06	L			
#10	50.60				

AFTER HYDROMETER ANALYSIS Scale Id.

Tyler Sieve Size	Pan No.	Pan Wt.	Dry Soil & Pan	Cum. Wt. Dry Soil Retained	% Finer Than	% Total Sample
#20	Lime2	3.67	9.07			
#40	Reeses	3.57	11.49			
#60	Loc	3.67	11.20			
#100	gram	3.63	11.84			
#200	ant	3.54	10.44			

HYDROMETER ANALYSIS R

Wt. of Wet Sample (Passing - #10 sieve) 59.888 | Wt. of Dry Sample (Passing - #10 sieve)

Observed Time	Elapsed Time (min.)	Temp (°C)	Hydrometer Reading Original	Corrected "R"	100Ra/W	% Total Sample	Grain Diameter (mm)	Correction Coef L	k	s	Corrected Diameter (mm)
1104	0		----	----	----	----	----	--	----	--	----
	1/2	22.9	27.								
1105	1	22.9	25.25								
1106	2	22.9	22.75								
1109	5	22.9	20.0								
1119	15	22.7	17.75								
1134	30	22.7	16.75								
1204	60	22.6	14.75								
1304	120	22.4	13.25								
1514	250	22.4	12.0								
12-30-2000 1125	1461	21.2	10.5								

ADVANCED TERRA TESTING, INC.

COMBINED MECHANICAL ANALYSIS FORM ASTM D 422

ATT/TP-0
REV ____

Client	Stone + Webster	Job No.	2162-13		
Boring No.	pt. 47	Sample Date	10-27-00	by	MM
Depth	0-0'	Date Prepped	01-08-01	by	WED
Sample No.	126-35863	Date Tested	01-11-01	by	DPM
Location	Maywood Pilot Demonstration	Date Washed	1/18/01	by	[illegible]
Soil Description		Thermometer No.	0729	Oven No.	

HYGROSCOPIC MOISTURE DETERMINATION Scale Id. L

Wt. of Wet Soil & Pan	84.95
Wt. of Dry Soil & Pan	83.46
Wt. of Water	
Wt. of Pan No. Shove	3.65
Wt. of Dry Soil	
Moisture Content, %	

TEST CONTENTS

Hydrometer No.	
Specific Gravity Calculated? yes☐ no☒	
Value of "a"	
Deflocculant	cc. of
Deflocculant Correction	6.0
Meniscus Correction	-1

Temperature, °C	23.23
Temperature Correction Coefficient k	.013138

Wt. of Dry Sample "W"	
% of Total Sample	

SIEVE ANALYSIS Scale Id. L

Wt. of Total Sample (wet)	
Wt. of Total Sample (dry)	
Wt. of + #10 (wet), Pan No. F4	45.00
Wt. of + #10 (dry)	
Wt. of - #10 (wet)	525.77
Wt. of - #10 (dry)	

Tyler Sieve Size	Dry Soil Retained	Scale Id.	Cum. Wt. Dry Soil Retained	% Finer Than	% Total Sample
3"	—				
1 1/2"	—				
3/4"	—				
3/8"	—				
#4	9.17				
#10	31.44				

AFTER HYDROMETER ANALYSIS Scale Id. C

Tyler Sieve Size	Pan No.	Pan Wt.	Dry Soil & Pan	Cum. Wt. Dry Soil Retained	% Finer Than	% Total Sample
#20	U15	3.23	8.91			
#40	ON	3.68	11.24			
#60	B1	3.66	11.12			
#100	CH8	3.84	12.32			
#200	D9	3.69	11.57			

HYDROMETER ANALYSIS

Wt. of Wet Sample (Passing - #10 sieve) 60.81g

Wt. of Dry Sample (Passing - #10 sieve) ____

Observed Time	Elapsed Time (min.)	Temp (°C)	Hydrometer Reading Original	Hydrometer Reading Corrected "R"	100Ra/W	% Total Sample	Grain Diameter (mm)	Correction Coef L	Correction Coef k	Correction Coef s	Corrected Diameter (mm)
1400	0		----	----	----	----	----	--	----	--	----
	1/2	23.4	28.0?								
1401	1	23.4	25.25								
1402	2	23.4	23.5								
1405	5	23.4	20.0								
1415	15	23.3	17.75								
1430	30	23.3	16.0								
1500	60	23.3	14.25								
~~1600~~	~~120~~ 147	23.2	12.25								
1810	250	23.2	11.75								
1554	1554	22.4	10.25								

ADVANCED TERRA TESTING, INC.

COMBINED MECHANICAL ANALYSIS FORM ASTM D 422

ATT/TP-02
REV

Client: Stone + Webster
Boring No.: Rinse-H2O-1
Depth: —
Sample No.: 126-035864
Location: Maywood Pilot Demonstration
Soil Description: Proj # 08575 0608

Job No.: 2162-14
Sample Date: 11/8/00 by BM
Date Prepped: 01/23/01 by MM
Date Tested: 1/25/01 by
Date Washed: 1/26/01 by
Thermometer No.:
Oven No.:

HYGROSCOPIC MOISTURE DETERMINATION Scale Id. L

Wt. of Wet Soil & Pan	8.00
Wt. of Dry Soil & Pan	7.91
Wt. of Water	
Wt. of Pan No. BR	0.97
Wt. of Dry Soil	
Moisture Content, %	

TEST CONTENTS

Hydrometer No.	
Specific Gravity Calculated? yes ☐ no ■	2.65
Value of "a"	
Deflocculant	cc. of
Deflocculant Correction	4
Meniscus Correction	-2

Temperature, °C	23.27
Temperature Correction Coefficient k	.013122

SIEVE ANALYSIS Scale Id. L

Wt. of Total Sample (wet)	
Wt. of Total Sample (dry)	
Wt. of + #10 (wet), Pan No.	
Wt. of + #10 (dry)	
Wt. of - #10 (wet)	31.91
Wt. of - #10 (dry)	

Wt. of Dry Sample "W"	
% of Total Sample	

Tyler Sieve Size	Dry Soil Retained	Scale Id.	Cum.Wt. Dry Soil Retained	% Finer Than	% Total Sample
3"					
1 1/2"					
3/4"					
3/8"					
#4					
#10					

AFTER HYDROMETER ANALYSIS Scale Id. C

Tyler Sieve Size	Pan No.	Pan Wt.	Dry Soil & Pan	Cum. Wt. Dry Soil Retained	% Finer Than	% Total Sample
#20	RX	3.68	3.74			
#40	TAIL	3.68	4.09			
#60	RH19	3.71	5.27			
#100	C3	3.71	7.29			
#200	bar	3.58	7.75			

HYDROMETER ANALYSIS L

Wt. of Wet Sample (Passing - #10 sieve) 24.864
Wt. of Dry Sample (Passing - #10 sieve)

Observed Time	Elapsed Time (min.)	Temp (°C)	Hydrometer Reading Original	Hydrometer Reading Corrected "R"	100Ra/W	% Total Sample	Grain Diameter (mm)	Correction Coef L	Correction Coef k	Correction Coef s	Corrected Diameter (mm)
956	0		----	----	----	----	----	--	----	--	----
	1/2	23.5	18.5								
957	1	"	~~16.5~~ 17.5								
958	2	"	17.0								
~~1000~~ 1001	5	"	15.0								
1011	15	23.6	13.25								
1026	30	23.3	12.5								
1056	60	23.3	11.0								
1156	120	23.2	10.25								
1406	250	23.1	9.0								
941		22.2	8.5								

RADIOACTIVE

ADVANCED TERRA TESTING, INC.

COMBINED MECHANICAL ANALYSIS FORM ASTM D 422

ATT/TP-0
REV____

Client: Stone + Webster
Boring No.: Rinse H_2O-7
Depth: —
Sample No.: 126-035870
Location: Maywood Pilot Demonstration
Soil Description: Proj # 085750608

Job No.: 2162-14
Sample Date: 11/13/00 by BM
Date Prepped: 01/23/01 by MM
Date Tested: 1/25/01 by [illegible]
Date Washed: 1/26/01 by [illegible]
Thermometer No.:
Oven No.:

HYGROSCOPIC MOISTURE DETERMINATION Scale Id. L

Wt. of Wet Soil & Pan	10.21
Wt. of Dry Soil & Pan	10.04
Wt. of Water	
Wt. of Pan No. 39C	2.34
Wt. of Dry Soil	
Moisture Content, %	

TEST CONTENTS

Hydrometer No.	
Specific Gravity Calculated? yes☐ no■	
Value of "a"	
Deflocculant	cc. of
Deflocculant Correction	4
Meniscus Correction	-2

SIEVE ANALYSIS Scale Id. L

Wt. of Total Sample (wet)	
Wt. of Total Sample (dry)	
Wt. of + #10 (wet), Pan No.	
Wt. of + #10 (dry)	
Wt. of - #10 (wet)	43.49
Wt. of - #10 (dry)	

Temperature, °C	23.5
Temperature Correction Coefficient k	.013090

Wt. of Dry Sample "W"	
% of Total Sample	

Tyler Sieve Size	Dry Soil Retained	Scale Id.	Cum. Wt. Dry Soil Retained	% Finer Than	% Total Sample
3"					
1 1/2"					
3/4"					
3/8"					
#4					
#10					

AFTER HYDROMETER ANALYSIS Scale Id. ____

Tyler Sieve Size	Pan No.	Pan Wt.	Dry Soil & Pan	Cum. Wt. Dry Soil Retained	% Finer Than	% To Samp
#20	HANES	3.63	3.64			
#40	Tom	3.60	3.60			
#60	4ME	3.66	~~3.67~~			
#100	DP6	~~3.66~~	~~3.69~~	3.66	3.70	
#200	A1	3.71	3.89			

HYDROMETER ANALYSIS B

Wt. of Wet Sample (Passing - #10 sieve) 35.541
Wt. of Dry Sample (Passing - #10 sieve) ____

Observed Time	Elapsed Time (min.)	Temp (°C)	Hydrometer Reading Original	Hydrometer Reading Corrected "R"	100Ra/W	% Total Sample	Grain Diameter (mm)	Correction Coef L	k	s	Corrected Diameter (mm)
945	0		----	----	----	----	----	--	----	--	----
	1/2	23.7	38.5								
946	1	"	37.0								
947	2	"	35.0								
950	5	"	31.25								
1000	15	"	26.5								
1015	30	"	23.5								
1045	60	23.6	21.0								
1145	120	23.5	18.25								
1355	250	23.3	16.25								
938	1433	22.4	13.0								

RADIOACTIVE

ADVANCED TERRA TESTING, INC.
COMBINED MECHANICAL ANALYSIS FORM ASTM D 422

ATT/TP-0
REV____

Client STONE + WEBSTER — Job No. 2162-14
Boring No. Rinse H_2O -3 — Sample Date 11/13/00 by BM
Depth — — Date Prepped 01/23/01 by MM
Sample No. 126-035871 — Date Tested 1/25/01 by [illegible]
Location Maywood Pilot Demonstration — Date Washed 1/26/01 by [illegible]
Soil Description proj # 085750608 — Thermometer No. ____ Oven No. ____

HYGROSCOPIC MOISTURE DETERMINATION Scale Id. 4

Wt. of Wet Soil & Pan	14.26
Wt. of Dry Soil & Pan	14.08
Wt. of Water	
Wt. of Pan No. 11C	2.79
Wt. of Dry Soil	
Moisture Content, %	

TEST CONTENTS

Hydrometer No.	
Specific Gravity Calculated? yes☐ no■	2.65
Value of "a"	
Deflocculant	cc. of
Deflocculant Correction	4
Meniscus Correction	-2

SIEVE ANALYSIS Scale Id. 4

Wt. of Total Sample (wet)	
Wt. of Total Sample (dry)	
Wt. of + #10 (wet), Pan No.	
Wt. of + #10 (dry)	
Wt. of - #10 (wet)	70.20
Wt. of - #10 (dry)	

Temperature, °C	23.58
Temperature Correction Coefficient k	.013074

Wt. of Dry Sample "W"	
% of Total Sample	

Tyler Sieve Size	Dry Soil Retained	Scale Id.	Cum.Wt. Dry Soil Retained	% Finer Than	% Total Sample
3"					
1 1/2"					
3/4"					
3/8"					
#4					
#10					

AFTER HYDROMETER ANALYSIS Scale Id. ____

Tyler Sieve Size	Pan No.	Pan Wt.	Dry Soil & Pan	Cum. Wt. Dry Soil Retained	% Finer Than	% Tot Samp
#20	View	3.61	3.62			
#40	Bar	3.67	3.68			
#60	SIEZ	3.63	3.77			
#100	BUC	4.03	6.38			
#200	A2	3.71	12.19			

HYDROMETER ANALYSIS 4

Wt. of Wet Sample (Passing - #10 sieve) 58.138 — Wt. of Dry Sample (Passing - #10 sieve) ____

Observed Time	Elapsed Time (min.)	Temp (°C)	Hydrometer Reading Original	Hydrometer Reading Corrected "R"	100Ra/W	% Total Sample	Grain Diameter (mm)	Correction Coef L	Correction Coef k	Correction Coef s	Corrected Diameter (mm)
938	0		----	----	----	----	----	--	----	--	----
	1/2	23.8	45								
939	1	"	43								
940	2	"	38.5								
943	5	"	34.0								
953	15	23.7	33.5								
1008	30	"	25.5								
1038	60	23.7	22.5								
1138	120	23.5	20.0								
1348	250	23.4	17.5								
9.35	1437	22.6	14.0								

% SOLIDS

CLIENT: STONE & WEBSTER JOB NO: 2162-14
LOCATION: MAYWOOD PILOT DEMONSTRATION PROJ # 085750608

Sample NAME	SAMPLE #	DATE Sampled	% SOLIDS
RINSE H_2O-1	126-035869	11-8-00/BM	4.93%
RINSE H_2O-2	126-035870	11-13-00/BM	5.42%
RINSE H_2O-3	126-035871	11-13-00/BM	7.33%

DATE Entered
DATE checked

By

% Solids

- Weight of bottle WITH EVERYTHING
  Can weigh with or without cap, just be CONSISTENT THRU OUT TEST.

- Decant WATER. RETAIN WATER & Weigh

- Weight of BOTTLE w/ slurry

- M.C. ON slurry MATERIAL
  DO NOT USE ALL MATERIAL FOR M.C.
  Remove remainder of material & AIR dry for g/s w/ HYDROMETER.

- Weight of Clean, dry, jar.

ADVANCED TERRA TESTING, inc
Calculation Worksheet

ATT/TP

Client Stone & Webster
Job No. 2162 – 14
Boring No. RINSE H_2O-3
Sample Date 11-13-00 by BM
Depth ——
Soil Description Proj. # 085750608
Sample No. 12b-035871
Location Maywood Pilot Demostration

Date Perfromed 1-9-01 by KF
Date Checked 01/24/01 by CW

Purpose: to determine % Solid

Method / Reference:

Assumptions / Comments:
PAN: ?!**!
M.C = 117.6 %
Loss of MOISTURE from MOISTURE CONTENT = 6.63 gms

Calculations:

WT. OF BOTTLE, CAP, WATER, SOLIDS = 1408.48 g

WT. OF DECANTED WATER = 777.39 g

WT. OF BOTTLE, CAP, WET SOLIDS = 630.76 g

WT. OF CLEAN JAR AND CAP = 483.63 g

1408.48 gms = Bottle, Cap, water & Solids
− 777.39 gms = Decanted H_2O
631.09 gms = Bottle, Cap & Solids
− 483.63 gms = Clean bottle & Cap
147.46 gms = WET SOLIDS

$$\frac{147.46 \text{ gms WET SOLIDS}}{2.176 \ (1+M.C.)} = 67.77 \text{ gms dry solids}$$ ✓

CW

0.07327 = 7.33

$$\frac{67.77 \text{ gms dry solids}}{147.46 \text{ gms (WET SOLIDS)} + 777.39 \text{ gms (DECANTED } H_2O) + \text{~~6.63 gms (MOISTURE loss from M.C.~~}} = \text{~~.072755~~} : 7.28\% \text{ SOL}$$

Results:

NOT NECESSARY, ACCOUNTED FOR HERE CW

J:\working\calcshee.lwp

ADVANCED TERRA TESTING, Inc
Calculation Worksheet

ATT/TP

Client: Stone & Webster

Job No. 2162-14

Boring No. RINSE H_2O-2

Sample Date 11-13-00 by BM

Depth —

Soil Description Proj. # 085750608

Sample No. 12b-035870

Location Maywood Pilot Demonstration

Date Perfromed 1-9-01 by KF

Date Checked 01/24/01 by CW

Purpose: to determine % Solid

Method / Reference:

Assumptions / Comments:

PAN: BOT

M.C = 155.7 %

Loss of MOISTURE from MOISTURE CONTENT = 7.94 gms

Calculations:

WT. OF BOTTLE, CAP, WATER, SOLIDS = 1377.78 g
WT. OF DECANTED WATER = 768.06 g
WT. OF BOTTLE, CAP, WET SOLID = 587.32 g
WT. OF CLEAN JAR, CAP 486.23 g

1377.78 gms = Bottle, Cap, water + solids
− 768.06 gms = Decanted H_2O
609.72 gms = Bottle, Cap + Solids
− 486.23 gms = Clean Jar + Cap
123.49 gms = WET SOLIDS ✓

$$\frac{123.49 \text{ gms wet solids}}{2.557 \leftarrow (1+M.C.)} = 48.29 \text{ gms dry solids}$$ ✓

$$\frac{48.29 \text{ gms dry solids}}{123.49 (\text{Wet solids}) + 768.06\text{ g} (\text{Decanted } H_2O) ~~+ 7.94 (\text{Moisture loss from M.C.})~~}$$

0.05417 = 5.42% CW

~~.053686~~ = ~~5.37%~~ so

NOT NECESSARY, ACCOUNTED FOR HERE CW

Results:

ADVANCED TERRA TESTING, Inc

Calculation Worksheet

ATT/TP

Client Stone & Webster | Job No. 2162-14

Boring No. RINSE H_2O-1 | Sample Date 11-8-00 by BM

Depth ___ | Soil Description Proj. # 085750608

Sample No. 12b-035869 | Location Maywood Pilot Demonstration

Date Perfromed 1-9-01 by KF/KR | Date Checked 01/24/01 by CW

Purpose: to determine % Solid

Method / Reference:

Assumptions / Comments: PAN: 804

M.C. = 70.4%

Loss of moisture from MOISTURE CONTENT = 2.97 gms

Calculations:

WT. OF BOTTLE, CAP, WATER, SOLIDS = 1340.26 g

WT. OF DECANTED WATER = 784.73 g

WT. OF BOTTLE, CAP, WET SOLIDS = 796.63 g

WT. OF CLEAN JAR AND CAP = 483.58 g

1340.26 gms = Bottle, cap, water + solids

− 784.73 gms = Decanted H_2O

555.53 gms = Bottle, cap + solids

− 483.58 gms = Clean bottle + cap

71.95 gms : Wet Solids ✓

$$\frac{71.95 \text{ gms wet solids}}{1.704 \leftarrow (1+M.C.)} = 42.22 \text{ gms dry solids}$$ ✓

CW

$$\frac{42.22 \text{ gms dry solids}}{71.95 \text{ (wet solids)} + 784.73 \text{ (Decanted } H_2O) + \sout{2.97 \text{ (Moisture Loss from M.C.)}}} = \sout{.04943} = \sout{4.91\%} \text{ solids}$$

0.04929 = 4.93%

Not necessary, accounted for here

Results:

CW

J:\working\calcshee.lwp

Post Test Radiological Screening Data

CLIENT Stone & Webster

JOB NO. ~~2162~~ 2162-13

BORING NO. PT # 7
DEPTH 0-0
SAMPLE NO. 126-35860
SOIL DESCR. Proj. # 085750608

DATE SAMPLED 9-14-00
DATE SCREENED 2-26-01

Alpha Background (CPM) :

Beta/Gamma Background (CPM) :

Sieve Fractions	Gross Alpha (CPM)	Gross Alpha (DPM) [CPM-BG*2.8]	Gross Beta/Gamma (CPM)	Gross Beta/Gamma (DPM) [CPM-BG*310]	Remarks
-3" to +1.5"	—		—		
-1.5" to +3/4"	—		—		
-3/4" to +3/8"	2		75		
-3/8" to +#4	6		95		
- #4 to +#10	8		90		
- #10 to +#20	6		85		
- #20 to +#40	2		80		
- #40 to +#60	4		75		
- #60 to +#100	6		85		
- #100 to +#200	8		90		
~~- #200~~					

Data entry by: Enter Initials Date: 02/26/2001
Checked by:______ Date:__________
FileName: Enter FileName

ADVANCED TERRA TESTING, INC.

Post Test Radiological Screening Data

CLIENT Stone & Webster

JOB NO. 2162 - 13

BORING NO. PT #7
DEPTH 0-0
SAMPLE NO. 126-35861
SOIL DESCR. Proj. # 085750608

DATE SAMPLED 10-2-00
DATE SCREENED 2-26-01 KF

Alpha Background (CPM) : 6

Beta/Gamma Background (CPM) : 80

Sieve Fractions	Gross Alpha (CPM)	Gross Alpha (DPM) [CPM-BG*2.8]	Gross Beta/Gamma (CPM)	Gross Beta/Gamma (DPM) [CPM-BG*310]	Remarks
-3" to +1.5"	—		—		
-1.5" to +3/4"	—		—		
-3/4" to +3/8"	6		90		
-3/8" to +#4	8		110		
- #4 to +#10	6		90		
- #10 to +#20	4		100		
- #20 to +#40	2		95		
- #40 to +#60	2		80		
- #60 to +#100	2		90		
- #100 to +#200	4		~~150~~ 130		
- #200	—		—		

Data entry by:
Checked by:______
FileName:

Enter Initials Date:
Date:__________
Enter FileName

02/26/2001

ADVANCED TERRA TESTING, INC.

Post Test Radiological Screening Data

CLIENT Stone & Webster

JOB NO. 2162-13

BORING NO. PT #7
DEPTH 0-0
SAMPLE NO. 126-35862
SOIL DESCR. Proj. #085750608

DATE SAMPLED 10-6-00
DATE SCREENED 2-26-01 KF

Alpha Background (CPM) : 6

Beta/Gamma Background (CPM) : 80

Sieve Fractions	Gross Alpha (CPM)	Gross Alpha (DPM) [CPM-BG*2.8]	Gross Beta/Gamma (CPM)	Gross Beta/Gamma (DPM) [CPM-BG*310]	Remarks
-3" to +1.5"	—		—		
-1.5" to +3/4"	—		—		
-3/4" to +3/8"	—		—		
-3/8" to +#4	7		105		
- #4 to +#10	8		110		
- #10 to +#20	8		110		
- #20 to +#40	4		90		
- #40 to +#60	4		85		
- #60 to +#100	2		80		
- #100 to +#200	4		95		
- #200	—		—		

Data entry by:
Checked by:______
FileName:

Enter Initials Date:
Date:___________
Enter FileName

02/26/2001

ADVANCED TERRA TESTING, INC.

Post Test Radiological Screening Data

CLIENT Stone & Webster

JOB NO. 2162-~~0~~13

BORING NO. PT #7
DEPTH 0-0
SAMPLE NO. 126-35863
SOIL DESCR. Proj. # 085750608

DATE SAMPLED 10-27-00
DATE SCREENED 2-26-01 KF

Alpha Background (CPM) : 6

Beta/Gamma Background (CPM) : 80

Sieve Fractions	Gross Alpha (CPM)	Gross Alpha (DPM) [CPM-BG*2.8]	Gross Beta/Gamma (CPM)	Gross Beta/Gamma (DPM) [CPM-BG*310]	Remarks
-3" to +1.5"	—		—		
-1.5" to +3/4"	—		—		
-3/4" to +3/8"	—		—		
-3/8" to +#4	2		75		
- #4 to +#10	12		90		
- #10 to +#20	4		90		
- #20 to +#40	4		95		
- #40 to +#60	2		80		
- #60 to +#100	2		100		
- #100 to +#200	6		110		
~~#200~~					

Data entry by: Enter Initials Date: 02/26/2001
Checked by:______ Date:__________
FileName: Enter FileName

ADVANCED TERRA TESTING, INC.

CHAIN-OF-CUSTODY RECORDS

ADVANCED TERRA TESTING, Inc. — ATT

Form F00047, Rev. 1

Approved: ______

Date: __/__/__

COC# 0543

Chain of Custody Record
AP-8.1

PROJ. NO. 085750608

PROJECT NAME Maywood, NJ Pilot Demonstration

Client Name: Stone & Webster

Boring (location)	Sample No.	Depth	Date Sampled	Time Sampled	Sampled By	Sample Type	NO. OF CONTAINERS	grain size analysis						REMARKS
pt. #7	12b-35860	0-0'	9.14.00	8:45	mm	soil	1	X						cooler 1 of 3
pt. #7	12b-35861	0-0'	10.2.00	13:56	mm	soil	1	X						cooler 1 of 3
pt. #9	12b-35862	0-0'	10.6.00	11:00	mm	soil	1	X						cooler 2 of 3
pt. #7	12b-35863	0-0'	10.27.00	13:00	mm	soil	1	X						cooler 3 of 3

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
[illegible]	11/15/00	1206	[illegible]				
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished for Laboratory by: (Signature)	Date	Time	Remarks: Fractions to be sent back to site for analysis.

Distribution: Original accompanies samples; yellow copy to recipient; pink copy retained by ATT, Inc.

APOL&P\DOC\QAFORMS\NEWFORM\F\F00047R1/11-99

ATT — Advanced Terra Testing, Inc.

Form F60047, Rev. 1

Approved: ________

Date: __/__/__

Chain of Custody Record
AP-8.1

COC# 0543-1

PROJ. NO. 085750608

PROJECT NAME MAYWOOD PILOT DEMONSTRATION

Client Name: STONE & WEBSTER

Boring (LOCATION)	Sample No.	Depth	Date Sampled	Time Sampled	Sampled By	Sample Type	NO. OF CONTAINERS	% Solid	GRAIN SIZE ANALYSIS					REMARKS
[redacted]														Gravel/Rinse water for filter design.
Rinse H_2O-3	126-035871	N/A	11-13-00	0850	BM	H_2O+fines	1	X	X					

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Babs Marquis	11/21/00	1200	Kurt R Fabkentlel 11-27-00 10:30				
K Fabkentlel	2/20/01	1300					
				Relinquished for Laboratory by: (Signature)			Remarks:

Distribution: Original accompanies samples; yellow copy to recipient; pink copy retained by ATT, Inc.

ATT

Form F00047, Rev. 1

Approved: ____________

Date: __/__/__

Chain of Custody Record
AP-8.1

COC# 0543-1

PROJ. NO. 085750608

PROJECT NAME MAYWOOD PILOT DEMONSTRATION

Client Name: STONE & WEBSTER

Boring (LOCATION)	Sample No.	Depth	Date Sampled	Time Sampled	Sampled By	Sample Type	NO. OF CONTAINERS	% Solid	GRAIN SIZE ANALYSIS					REMARKS
Rinse H_2O-1	12b-035869	N/A	11-8-00	0940	BM	H_2O+fines	1	X	X					Gravel/Rinse water
Rinse H_2O-2	12b-035870	N/A	11-13-00	0845	BM	H_2O+fines	1	X	X					for filter design.

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Babs Marquis	11/21/00	12:00	Kurt R Fakeutter 11-27-00 10:00				
Relinquished by: (Signature) KFakeutter	Date 2/20/01	Time 1300	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished for Laboratory by: (Signature)	Date	Time	Remarks:

Distribution: Original accompanies samples, yellow copy to recipient; pink copy retained by ATT, Inc.

ANCILLARY INFORMATION

COOLER RECEIPT CHECKLIST

LIMS number ____________ Chain-of-Custody No. 0543

Project: MAYWOOD SUPERFUND SITE Date received: 11-16-00

A Preliminary Examination Phase Date cooler(s) opened: 11-16-00

by (print)____________ (signature)____________

Circle response below as appropriate

		Yes	No	NA
1.	Did cooler(s) come with a shipping slip (airbill, etc.)?	(Yes)	No	NA

If YES, enter courier name & airbill number here: ____________

2.	Were custody seals on outside of cooler(s)?	(Yes)	No	NA

How many & where: 1 ON COOLER 1 OF 3 Seal date: 10-5-00 Seal name: ____________

3.	Were custody seals unbroken and intact at the date and time of arrival?	(Yes)	No	NA
4.	Did you screen samples for radioactivity using a Geiger Counter?	Yes	No	NA
5.	Were custody papers sealed in a plastic bag & taped inside the cooler lid?	(Yes)	No	NA
6.	Were custody papers filled out properly (ink, signed, etc.)?	(Yes)	No	NA
7.	Did you sign custody papers in the appropriate place for acceptance of custody?	(Yes)	No	NA
8.	Was project identifiable from custody papers?	(Yes)	No	NA
9.	If required, was enough ice present in the cooler(s)?	Yes	No	(NA)

Identify type of ice used in cooler and temperature reading upon receipt: ____________

Source of temperature reading (check one): Temperature Vial ( ) Sample Material ( )

10. Initial and date this form to acknowledge receipt of cooler(s): (initial)________ (date)________

B. Log-In-Phase Date samples were logged in: ____________

by (print)____________ (signature)____________

11. Describe type of packing in cooler(s): ____________

12.	Were all bottles sealed in separate plastic bags?	Yes	No	NA
13.	Did all bottles arrive unbroken & were labels in good condition?	Yes	No	NA
14.	Was all required bottle label information complete?	Yes	No	NA
15.	Did all bottle labels agree with custody papers?	Yes	No	NA
16.	Were correct containers used for the analyses indicated:	Yes	No	NA
17.	Were correct preservatives placed into the sample containers?	Yes	No	NA
18.	Was a sufficient amount of sample sent for the analyses required?	Yes	No	NA
19.	Were bubbles absent in VOA vials?	Yes	No	NA

If no, list by sample number: ____________

20.	Has a copy of this Cooler Receipt Checklist been faxed to the SAIC Laboratory Coordinator?	Yes	No	NA

Figure 3-6. Example of a Cooler Receipt Checklist

98-098P(DOC)/060298

COOLER RECEIPT CHECKLIST

LIMS number ____________ Chain-of-Custody No. 0543 - 1

Project: FUSRAP MAYWOOD SFS Date received: 11-22-00

A. Preliminary Examination Phase Date cooler(s) opened: 11-27-00

by (print) ____________ (signature) ____________

Circle response below as appropriate

1. Did cooler(s) come with a shipping slip (airbill. etc.)?	(Yes)	No	NA
If YES, enter courier name & airbill number here: FED Ex			
2. Were custody seals on outside of cooler(s)?	~~Yes~~	(No)	NA
How many & where: ______ Seal date: ______ Seal name: ______			
3. Were custody seals unbroken and intact at the date and time of arrival?	Yes	No	(NA)
4. Did you screen samples for radioactivity using a Geiger Counter?	Yes	No	NA
5. Were custody papers sealed in a plastic bag & taped inside the cooler lid?	(Yes)	No	NA
6. Were custody papers filled out properly (ink, signed, etc.)?	(Yes)	No	NA
7. Did you sign custody papers in the appropriate place for acceptance of custody?	(Yes)	No	NA
8. Was project identifiable from custody papers?	(Yes)	No	NA
9. If required, was enough ice present in the cooler(s)?	Yes	No	(NA)

Identify type of ice used in cooler and temperature reading upon receipt: ____________

Source of temperature reading (check one): Temperature Vial ( ) Sample Material ( )

10. Initial and date this form to acknowledge receipt of cooler(s): (initial) KF (date) 11-27-00

B. Log-In-Phase Date samples were logged in: 11-27-00

by (print) KURT FALKENTHAL (signature) Kurt R Falkenthal

11. Describe type of packing in cooler(s): JARS

12. Were all bottles sealed in separate plastic bags?	Yes	(No)	NA
13. Did all bottles arrive unbroken & were labels in good condition?	(Yes)	No	NA
14. Was all required bottle label information complete?	(Yes)	No	NA
15. Did all bottle labels agree with custody papers?	(Yes)	No	NA
16. Were correct containers used for the analyses indicated?	(Yes)	No	NA
17. Were correct preservatives placed into the sample containers?	Yes	No	(NA)
18. Was a sufficient amount of sample sent for the analyses required?	(Yes)	No	NA
19. Were bubbles absent in VOA vials?	Yes	No	(NA)

If no, list by sample number: ____________

20. Has a copy of this Cooler Receipt Checklist been faxed to the SAIC Laboratory Coordinator?	Yes	No	NA

Figure 3-6. Example of a Cooler Receipt Checklist

COOLER RECEIPT CHECKLIST

LIMS number ____________ Chain-of-Custody No. 0543-1

Project: FUSRAP MAYWOOD SFS Date received: 11-22-00

A. Preliminary Examination Phase Date cooler(s) opened: 11-27-00

by (print) KURT FALKENTHAL (signature) Kurt R Falkenthal

Circle response below as appropriate

		Yes	No	NA
1.	Did cooler(s) come with a shipping slip (airbill, etc.)?	(Yes)	No	NA

If YES, enter courier name & airbill number here: ____________

		Yes	No	NA
2.	Were custody seals on outside of cooler(s)?	Yes	(No)	NA

How many & where: ________ Seal date: ________ Seal name: ________

		Yes	No	NA
3.	Were custody seals unbroken and intact at the date and time of arrival?	Yes	No	(NA)
4.	Did you screen samples for radioactivity using a Geiger Counter?	Yes	No	NA
5.	Were custody papers sealed in a plastic bag & taped inside the cooler lid?	(Yes)	No	NA
6.	Were custody papers filled out properly (ink, signed, etc.)?	(Yes)	No	NA
7.	Did you sign custody papers in the appropriate place for acceptance of custody?	(Yes)	No	NA
8.	Was project identifiable from custody papers?	(Yes)	No	NA
9.	If required, was enough ice present in the cooler(s)?	Yes	No	(NA)

Identify type of ice used in cooler and temperature reading upon receipt: ____________

Source of temperature reading (check one): Temperature Vial ( ) Sample Material ( )

10. Initial and date this form to acknowledge receipt of cooler(s): (initial) KF (date) 11-27-00

B. Log-In-Phase Date samples were logged in: 11-27-00

by (print) KURT FALKENTHAL (signature) Kurt R Falkenthal

11. Describe type of packing in cooler(s): ____________

		Yes	No	NA
12.	Were all bottles sealed in separate plastic bags?	Yes	(No)	NA
13.	Did all bottles arrive unbroken & were labels in good condition?	(Yes)	No	NA
14.	Was all required bottle label information complete?	(Yes)	No	NA
15.	Did all bottle labels agree with custody papers?	(Yes)	No	NA
16.	Were correct containers used for the analyses indicated?	(Yes)	No	NA
17.	Were correct preservatives placed into the sample containers?	Yes	No	(NA)
18.	Was a sufficient amount of sample sent for the analyses required?	(Yes)	No	NA
19.	Were bubbles absent in VOA vials?	Yes	No	(NA)

If no, list by sample number: ____________

		Yes	No	NA
20.	Has a copy of this Cooler Receipt Checklist been faxed to the SAIC Laboratory Coordinator?	Yes	No	NA

Figure 3-6. Example of a Cooler Receipt Checklist

FORM 1-1

RADIOACTIVE MATERIALS SAMPLE SCREENING DATA SHEET

Revised 12/5/95

Type of Activity	LS Action Limit (dpm)	NCS Action Limit (dpm)	Measured Background (cpm)	CF
Beta/Gamma	20,000	1,000,000	90	3.0
Alpha	300	1,000	6	2.8

Initiation Date: 11/30/00

Termination Date: 11/30/00

Instrument(S/N) 094570

Instrument (S/N) 105027

Client STONE & WEBSTER, MAYWOOD SFS

Preparer: CHRIS WIENECKE (Print Name)

Initials CW

Alpha Probe (S/N) 095644

Beta/Gamma Probe (S/N) 116431

Date	Sample I.D.	Job. No.	Alpha Survey: Sample Count (cpm)	Alpha Survey: NET Activity (dpm)	Beta/Gamma Survey: Sample Count (cpm)	Beta/Gamma Survey: NET Activity (dpm)	Sample Designation NS/LS/NCS	Comments	Initials
11/30/00	126-035869	2162-14	10	11	90	ϕ	NS	WATER SAMPLE w/SOLIDS	CW
11/30/00	126-035870	2162-14	16	28	90	ϕ	NS	WATER SAMPLE w/SOLIDS	CW
11/30/00	126-035871	2162-14	16	28	90	ϕ	NS	WATER SAMPLE w/SOLIDS	CW

NOTHING FOLLOWS CW

Advanced Terra Testing, Inc.

FORM 1-1

RADIOACTIVE MATERIALS SAMPLE SCREENING DATA SHEET

Revised 12/5/95

Type of Activity	LS Action Limit (dpm)	NCS Action Limit (dpm)	Measured Background (cpm)	CF
Beta/Gamma	20,000	1,000,000	90	3.0
Alpha	300	1,000	6	2.8

Initiation Date: 11/30/00

Termination Date: 11/30/00

Instrument(S/N) 094570

Instrument (S/N) 115027

Client Stone & Webster, Maywood SFS

Preparer: Chris W[illegible] (Print Name)

Initials CW

Alpha Probe (S/N) 095044

Beta/Gamma Probe (S/N) 116431

Date	Sample I.D.	Job. No.	Alpha Survey Sample Count (cpm)	Alpha Survey NET Activity (dpm)	Beta/Gamma Survey Sample Count (cpm)	Beta/Gamma Survey NET Activity (dpm)	Sample Designation NS/LS/NCS	Comments	Initials
11/30/00	12b-35862	2162-13	80	207	β = 250 γ = 18,600	18,850	NS	5 Gallon Bucket for GSA/Hyd Save All	CW
↓	12b-35863		90	235	β = 125 γ = 18600	18,725	NS	Sieve splits, re-screen & return w/original	
↓	12b-35860	↓	10	11	β = [illegible] γ = 3100	3125	NS	samples to site in Maywood, NJ.	↓
11/30/00	12b-35861	2162-13	100	263	β = 100 γ = 18600	18,700	NS.	If questions, call Bars Marquis, S&W	CW

γ=([illegible]-90)3.0
β=(250-150)2.5
γ=(150-90)3.0
β=(200-150)2.5
γ=(100-90)3.0
β=(100-100)2.5
γ=(150-90)3.0
β=(190-150)2.5

FAX TRANSMITTAL FORM

ADVANCED TERRA TESTING, Inc.

ATT

833 Parfet Street
Lakewood, Colorado 80215
USA

Date: 2/8/2001

Name:	BABS MARQUIS
Company/Dept:	STONE & WEBSTER
FAX No:	1.617.589.1008
Telephone No:	

From:

Name:	Kerry Repola
Company/Dept:	ADVANCED TERRA TESTING, Inc.
FAX No:	(303) 232-1579
Telephone No:	(303) 232-8308

Number of Pages in Transmission, Including Transmittal Sheet 12

Hard Copy Will Be Mailed:

Hard Copy Will Not Be Mailed:

Additional Instructions/Comments:

r:\faxalogo.lwp/02-98/rv

Report data as you requested. Call with any questions.

Thanks,

Kerry

FAX TRANSMITTAL FORM

ADVANCED TERRA TESTING, Inc.

ATT

833 Parfet Street
Lakewood, Colorado 80215
USA

Date: 2/8/2001

Name:	BABS MARQUIS
Company/Dept:	STONE & WEBSTER
FAX No:	1.617.589.1008
Telephone No:	

From:

Name:	Kerry REPOLA
Company/Dept:	ADVANCED TERRA TESTING, Inc.
FAX No:	(303) 232-1579
Telephone No:	(303) 232-8308

Number of Pages in Transmission, Including Transmittal Sheet 13

Hard Copy Will Be Mailed:

Hard Copy Will Not Be Mailed:

Additional Instructions/Comments:

r:\faxalogo.lwp/02-98/rv

Report data as you requested. If you have any questions, please call.

Thanks,

Kerry

RECORD OF TELEPHONE CONVERSATION

INCOMING ☒ OUTGOING ☐

Date: 2-27-01	Job No.: 2162-13
Recorded By: KF	Owner/Client:
Talked With: Babs Marquis	of Stone & Webster
Phone No.: 617-589-1382	

Route To: Information Action

Main Subject of Call: Where to send "Individual Screen Samples".

Items Discussed: They should be sent to Mike Winters at the Maywood Site.

ADVANCED TERRA TESTING inc

SAMPLES SENT BACK: 2-27-01
STONE & WEBSTER
100 W. HUNTER AVE.
Maywood, NJ 07607

ATT
833 Parfet Street, Unit A
Lakewood, CO. 80215
Tel: (303) 232-8308
Fax: (303) 232:1579
E-mail: terratest@aol.com
www.terratesting.com

INDIVIDUAL SIEVE FRACTIONS
- ATTN: MIKE WINTERS

RADIOACTIVE!

TO: STONE & WEBSTER DATE: 1-27-01

RE: Sample storage
ATT Number - 2162-13
Project name - FUSRAP MAYWOOD SUPERFUND SITE
Project number - 085750608
Department - RAD.

This is a reminder to inform you that your samples were received under this classification (see above). All Soil Samples, Rock Samples, Geosysnthetic material, tested specimens or any other items related to the above referenced project(s) will be returned to you at the completion of testing.

If you wish to make other arrangements, please contact Kurt Falkenthal (sample management coordinator) at the above numbers. Costs of returning samples to clients will be billed to the client, unless other arrangements have been made. Thank you for your cooperation.

r:\clients\correspo\allother\radnot.lwp

SENT BACK: 2-21-01
STONE & WEBSTER
100 W. HUNTER AVE.
MAYWOOD, NJ 07607
201-226-6622
ATTN: BABS MARQUIS

ATT
833 Parfet Street, Unit A
Lakewood, CO. 80215
Tel: (303) 232-8308
Fax: (303) 232-1579
E-mail: terratest@aol.com
www.terratesting.com

RADIOACTIVE!

TO: STONE & WEBSTER DATE: 2-2-01

RE: Sample storage
ATT Number - 2162-14
Project name - MAYWOOD PILOT DEMONSTRATION
Project number - 085750608
Department - RAD

This is a reminder to inform you that your samples were received under this classification (see above). All Soil Samples, Rock Samples, Geosynthetic material, tested specimens or any other items related to the above referenced project(s) will be returned to you at the completion of testing.

If you wish to make other arrangements, please contact Kurt Falkenthal (sample management coordinator) at the above numbers. Costs of returning samples to clients will be billed to the client, unless other arrangements have been made. Thank you for your cooperation.

r:\clients\correspo\allother\radnot.lwp

APPENDIX I
DUST MONITORING DATA

FUSRAP SAFETY & HEALTH RECORDS TRANSMITTAL

TO: Bill Lenczuk
Stone & Webster FMSS SSHO

FROM: Mike Winters
Safety & Ecology Site Manager/FMSS RSO

NO. FMSS01.009

DATE 02/02/2001

SITE: Maywood

ITEM NO.	DESCRIPTION
1	Ballod Remedial Action Safety & Health Logbook (07/17/00 to 11/6/00)
2	Site Support (08575.02.04) Safety & Health Logbook (08/21/00 to 12/29/00)
3	TCRA (Howcroft Swale/Lodi Brook) Safety & Health Logbook (11/16/99 to 09/12/00)
4	Pilot Study Industrial Hygiene Air Monitoring Data Sheets (CY00)

COMMENTS:

Separate by item number (w/ cover copy of transmittal) when scanning into PDF file form. Identify individual files in Documentum by the "transmittal number-item number" unless otherwise noted (e.g., FMSS01008-01).

RECEIVED BY: [signature] DATE: 5-Feb-01

AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: PILOT DEMO	WEATHER CONDITIONS: Clear skies	DATE: 8/17/00

PERSON PERFORMING MONITORING: RM Coblentz

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
SEE HWP's.			DUST TRAK	21760
014, 015, 016			DUST TRAK	21762

INSTRUMENTS CALIBRATION	PPE IN USE:	PROCESS:
YES [x] NO [ ]	Hand/Foot Protection	Processing STEPAN STOCKPILE

MONITORING DATA

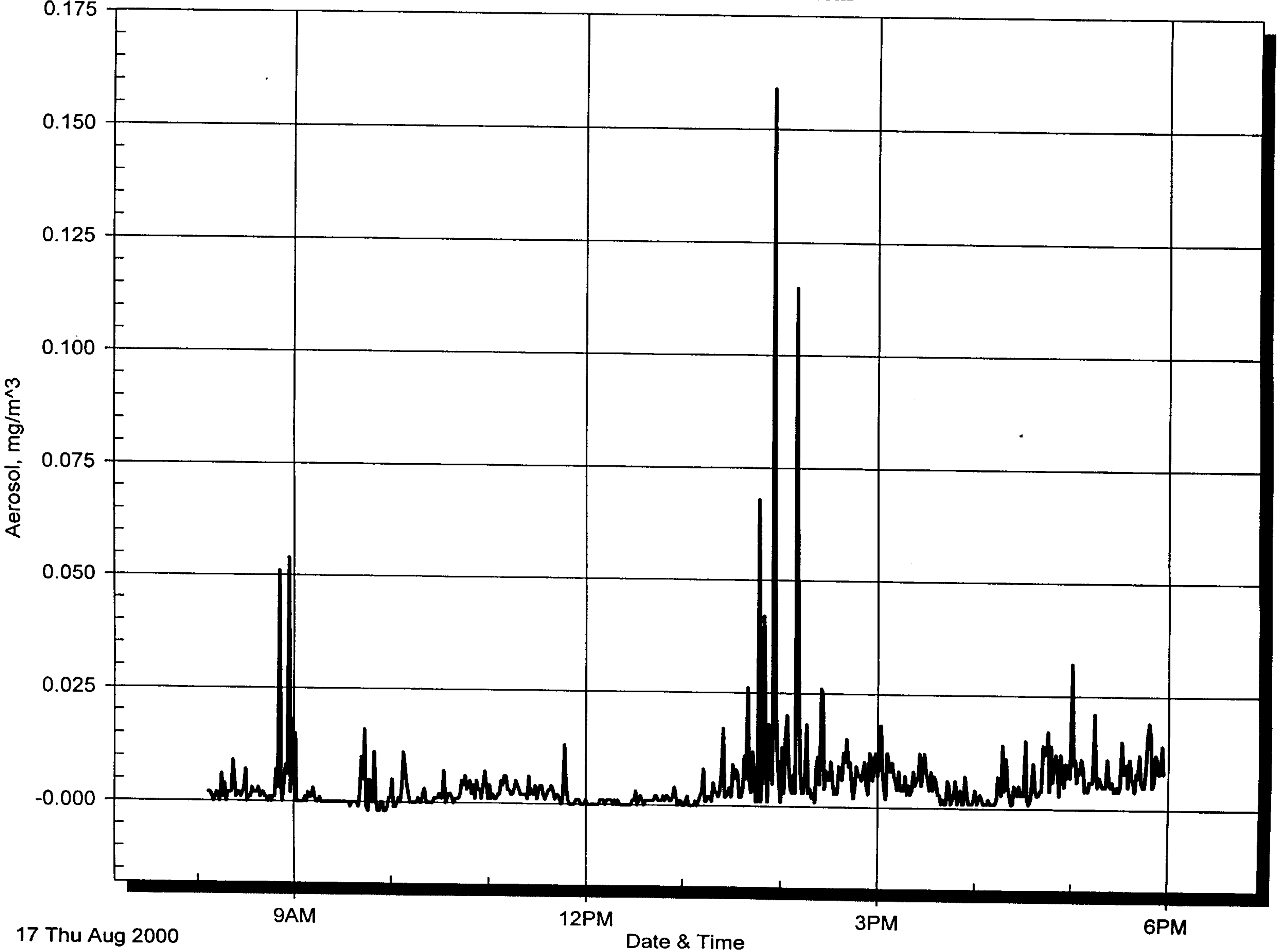
LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H2S (ppm)
Pilot D/W Perim.	1045	.007					
Pilot W/A	1115	.035					
D/W	1300	.002					
W/A No material being Run	1310	.003					
Bucket lift @ STOCKPILE	1600	.03					
Bucket Dump area	↓	.8					
Franklin Aggregate Separation area		.05					
Thermo Aggregate Separation area		.04					
Clean material conveyor area		~~0.~~ .2 8/17/00					
Hot material conveyor area	↓	.1					

CONTINUED ON REVERSE SIDE

FUSRAP S-023 (09/22/94)

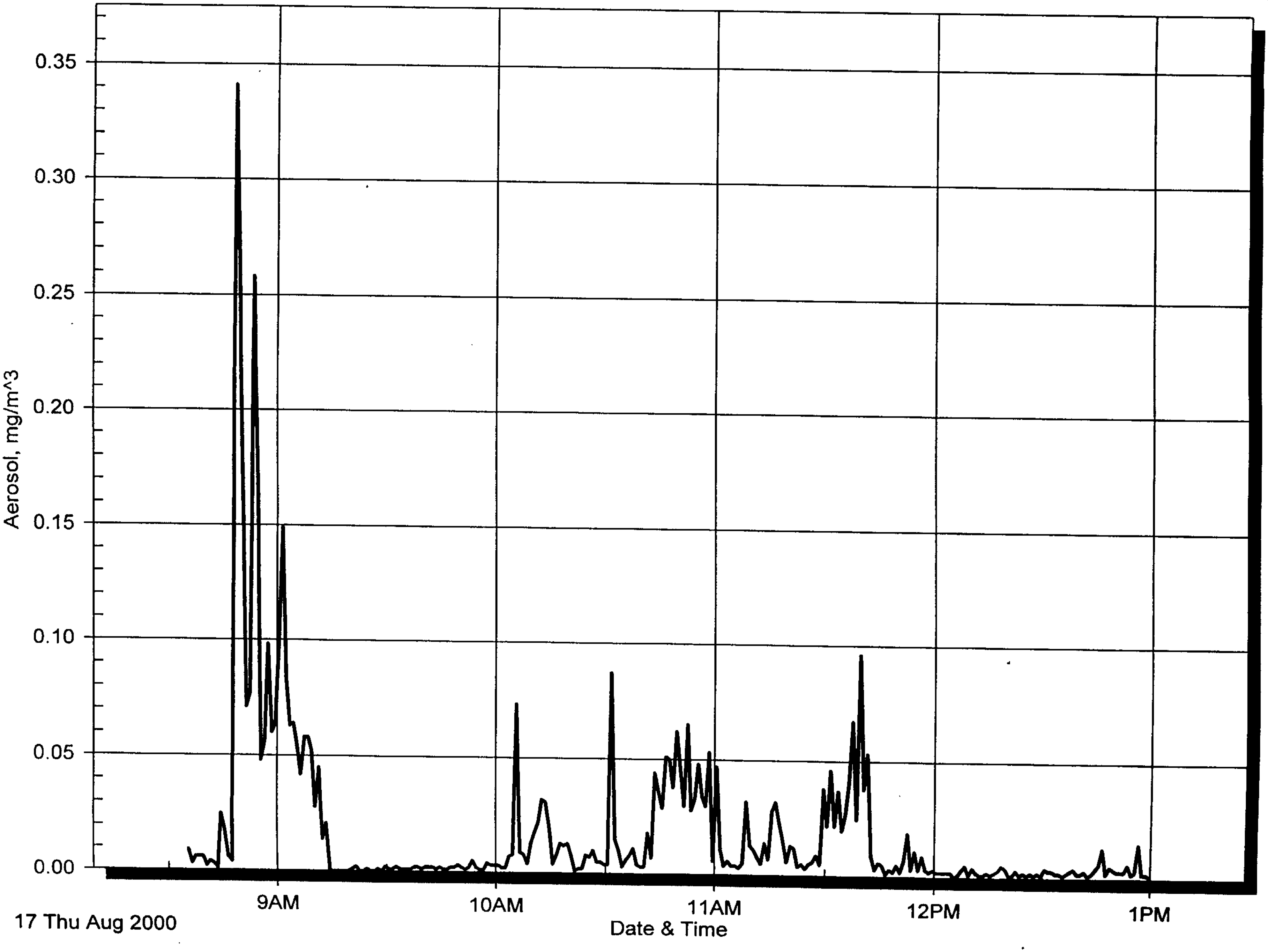
MAYWOOD PILOT PROJECT

Downwind Perime. Dust Concentrations



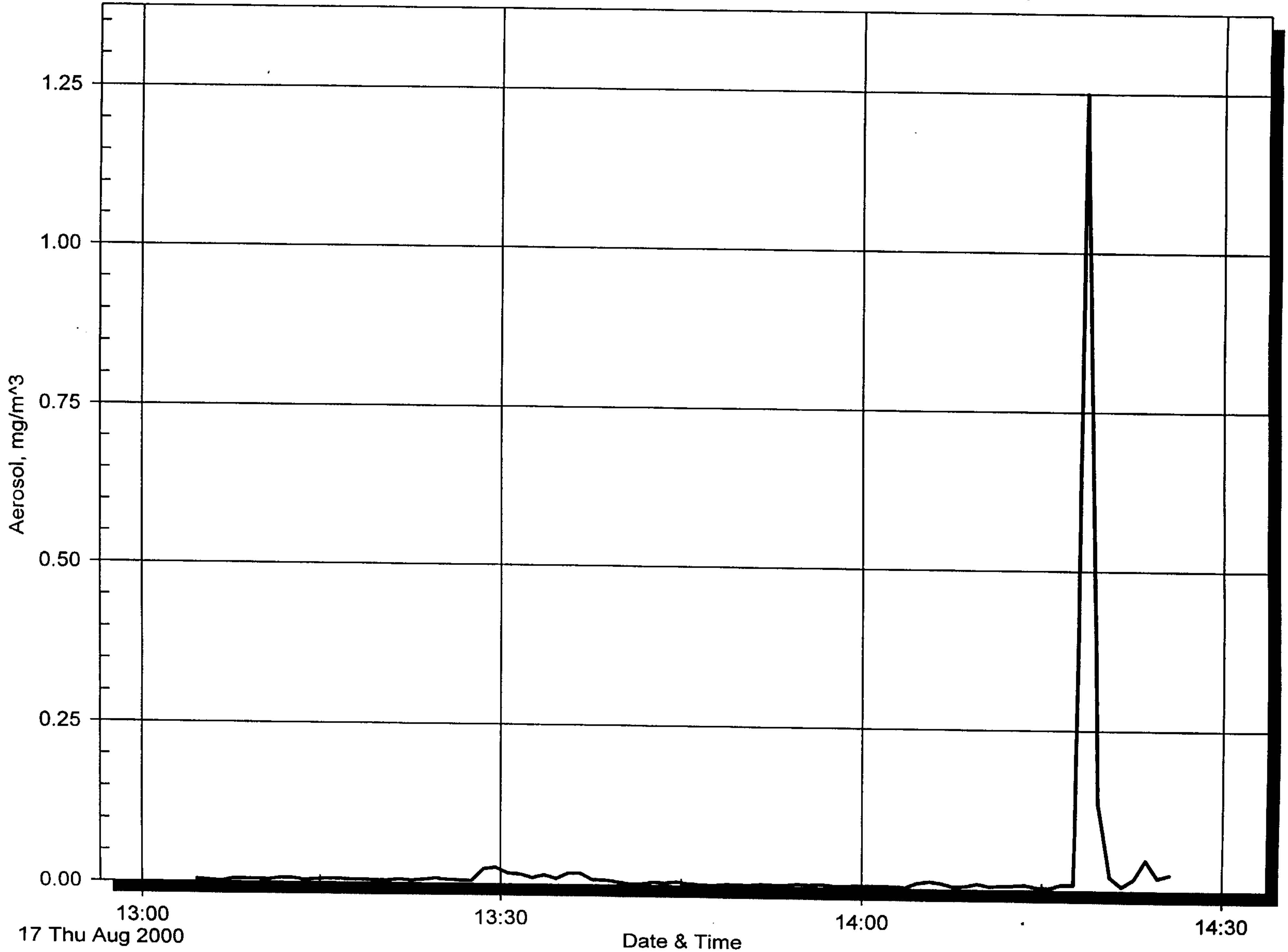
MAYWOOD PILOT PROJECT

Work Area D Concentrations



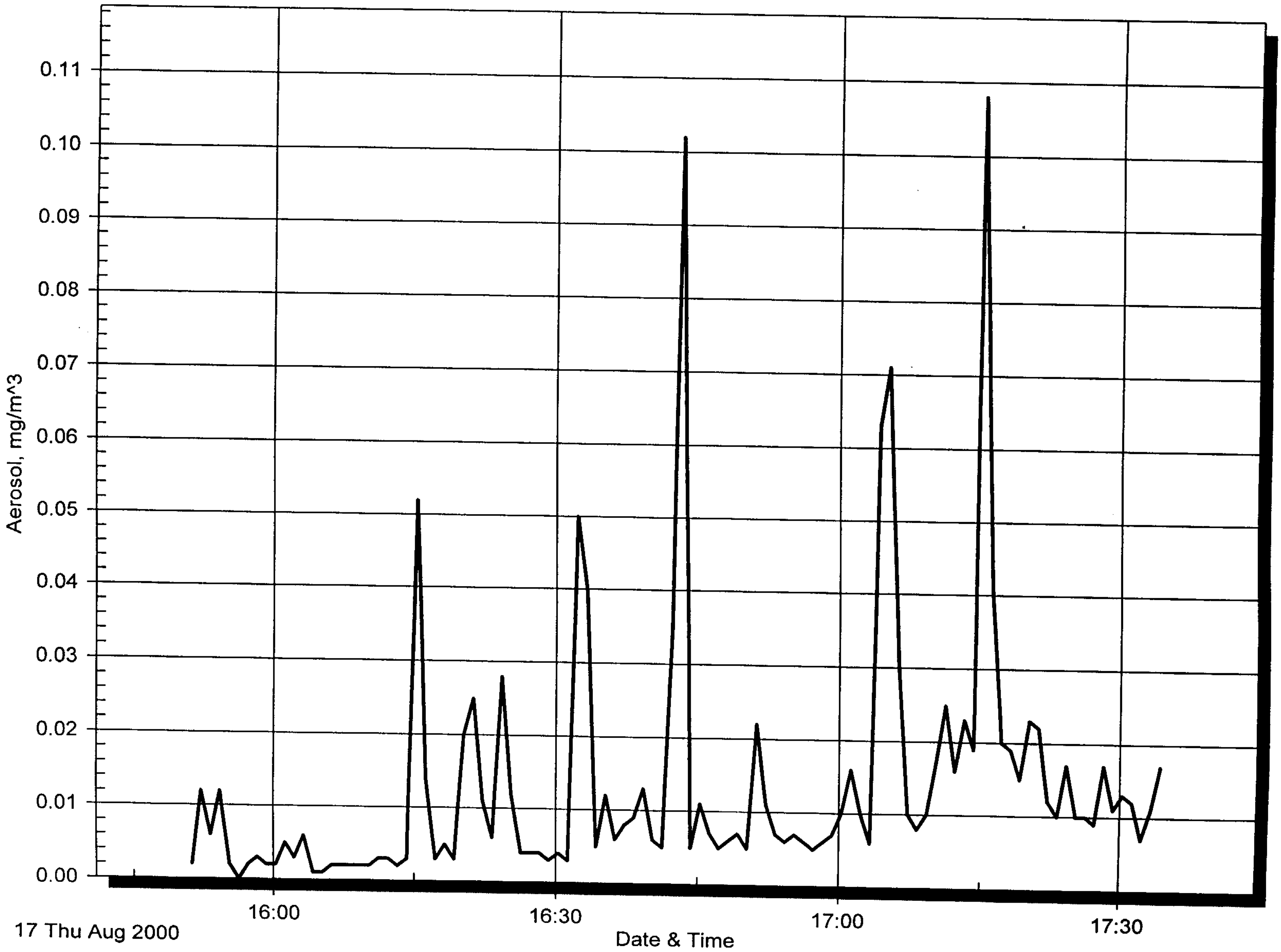
MAYWOOD PILOT PROJECT

Work Area D Concentrations



MAYWOOD PILOT PROJECT

Work Area Dust Concentrations



AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: MISS	WEATHER CONDITIONS: Cloudy Wind from the west	DATE: 8/18/00
PERSON PERFORMING MONITORING: RM Cobantz		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See HWP's				
014, 015, & 016			DUST TRAK (WORK AREA)	21760
			DUST TRAK (Downwind)	21762

INSTRUMENTS CALIBRATION	PPE IN USE:	PROCESS:
YES [X] NO [ ]	See HWP	Processing Soil from STEPAN Stockpile

MONITORING DATA

LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H2S (ppm)
Downwind Perimeter	0800	.002					
Work area @ Franklin separator	0830	.01					
Work area @ Franklin Separator	0930	.007					
Downwind Perimeter	1030	.001					
Work area @ Franklin Separator	1100	.02					
Work area @ Thermo Separator	↓	.03					
Work area @ "Hot" conveyor		.02					
Work area @ "Clean" conveyor		.03					
Work area @ Stockpile		.02					
N/A			N/A				

CONTINUED ON REVERSE SIDE

Pilot Work Area

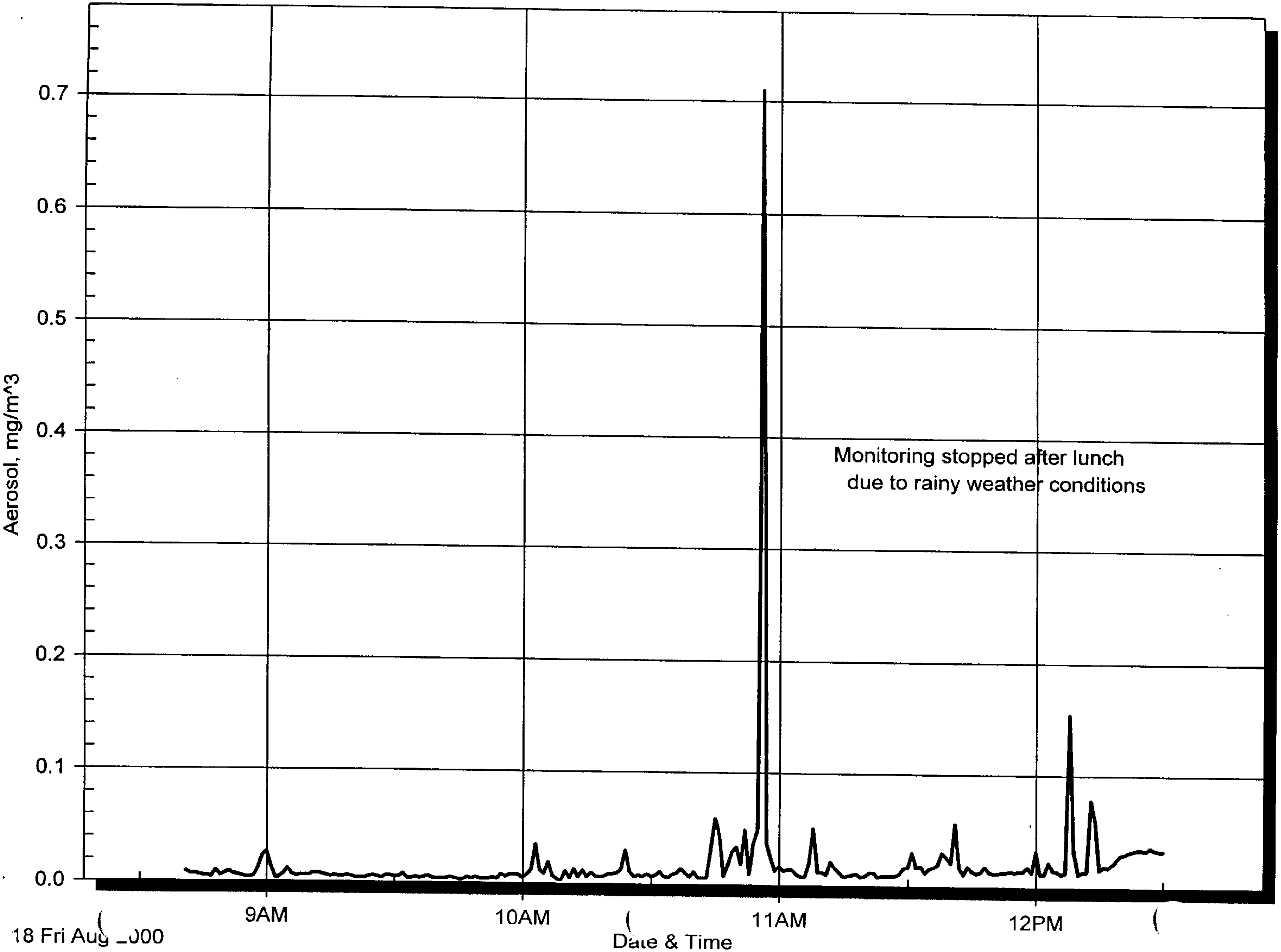
Current test:	004
Start time:	08:39:53 08/18/2000
Stop time:	14:51:53 08/18/2000

Logging interval: 60 seconds

Serial Number:	22008
Sensor:	Aerosol
Cal. Date:	09/23/1999

Channel:	Aerosol
(Units)	mg/m^3
Average:	0.040
Minimum:	0.003
Time	09:44:53
Date	08/18/2000
Maximum:	0.710
Time	10:55:53
Date	08/18/2000

MAYWOOD PILOT PROJECT
Work Area Dust Concentrations



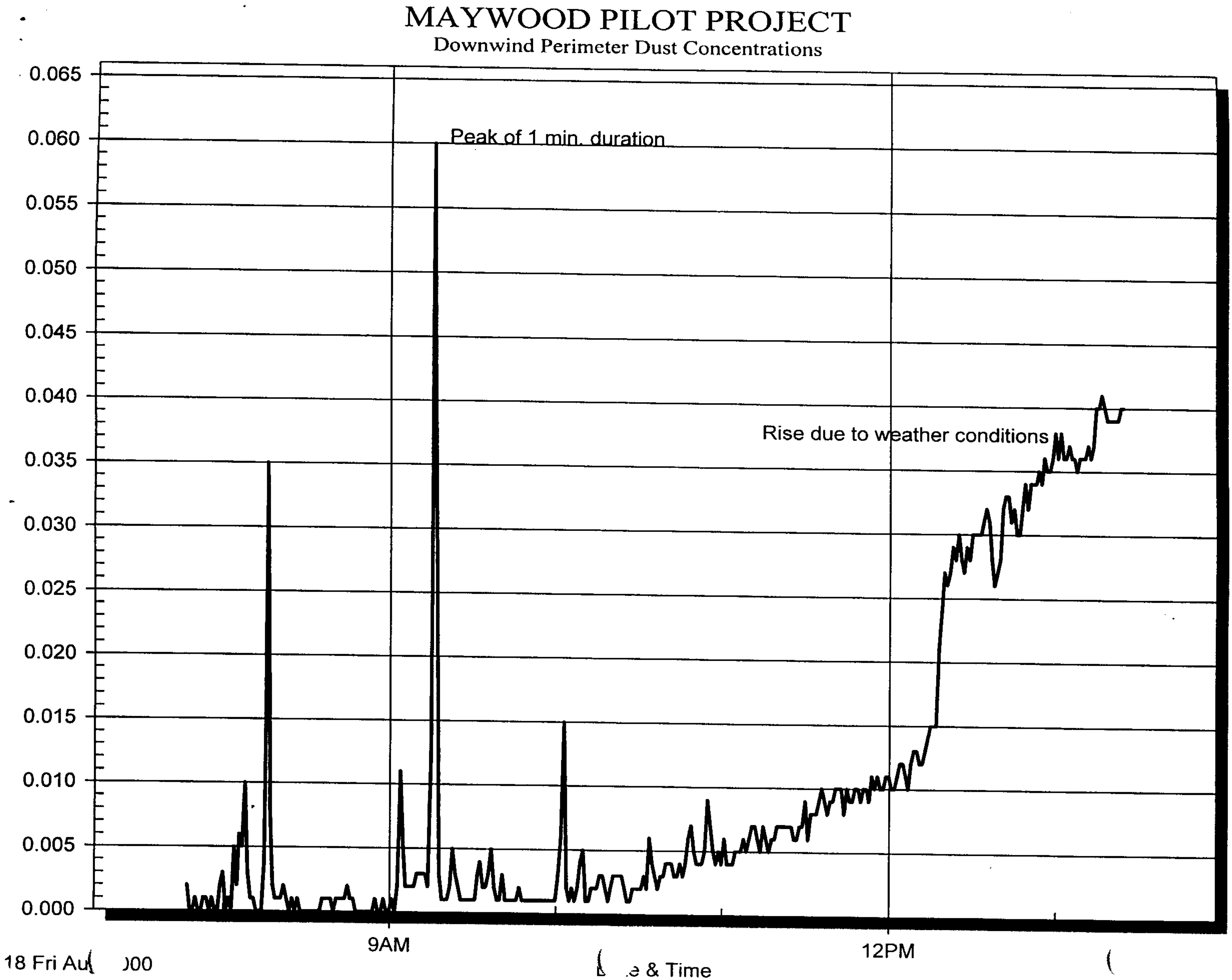
Pilot Down Wind Perimeter

Current test:	**002**	
Start time:	**07:45:47**	**08/18/2000**
Stop time:	**13:24:47**	**08/18/2000**

Logging interval: **60 seconds**

Serial Number:	**22007**
Sensor:	**Aerosol**
Cal. Date:	**09/23/1999**

Channel:	**Aerosol**
(Units)	**mg/m^3**
Average:	**0.010**
Minimum:	**0.000**
Time	**07:47:47**
Date	**08/18/2000**
Maximum:	**0.060**
Time	**09:15:47**
Date	**08/18/2000**


MAYWOOD PILOT PROJECT
Downwind Perimeter Dust Concentrations
0.065
0.060
0.055
0.050
0.045
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Peak of 1 min. duration
Rise due to weather conditions
9AM
12PM
18 Fri Au
00
e & Time

AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: Maywood	WEATHER CONDITIONS: Clear, Light Breeze from west		DATE: 8/21/00
PERSON PERFORMING MONITORING: RM Coblentz			

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See ~~HPW~~ HWP's			MULTI RAE	21809
014, 015, 016			Q-200	21755
			DUST TRAK	21760

INSTRUMENTS CALIBRATION	PPE IN USE:	PROCESS:
YES [X] NO [ ]	See HWP	PILOT PROJECT

MONITORING DATA

LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H2S (ppm)
STEPAN STOCKPILE (newly exposed soil)	0915	0.0	Ø	Ø	21.1	Ø	Ø
Stepan stock ~~pile~~ Pile (exposed soil)	1045	0.0	Ø	Ø	21.1	Ø	Ø
Franklin machine while operating	1100	.03	Ø	Ø	21.1	Ø	Ø
Thermo machine while operating	1100	.03	Ø	Ø	21.1	Ø	Ø
Downwind perimeter - south (wind shift: from north)	1130	0.0	N/A	N/A	N/A	N/A	N/A
Downwind perimeter	1300	0.0	N/A	N/A	N/A	N/A	N/A
STEPAN STOCKPILE	1345	.02	Ø	Ø	20.8	~~N/~~ Ø	Ø
Franklin machine while operating	1415	.02	Ø	1	20.8	~~Ø~~ 8/21/00 1	Ø
Thermo machine while operating	1415	.03	Ø	1	20.8	1	Ø
Downwind perimeter (east) (wind shift: from west)	1450	0.0	N/A	N/A	N/A	N/A	N/A

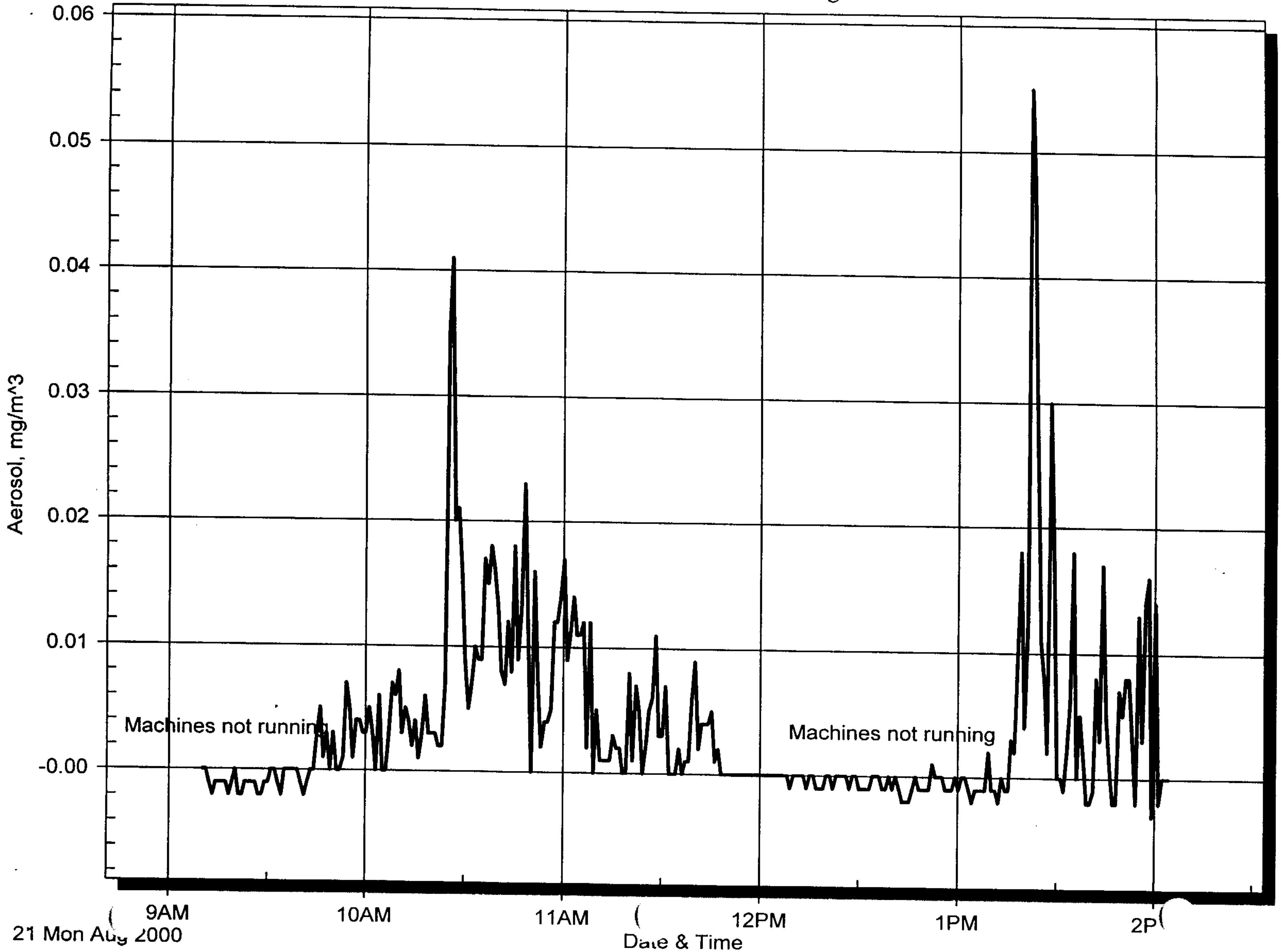
A

N

CONTINUED ON REVERSE SIDE

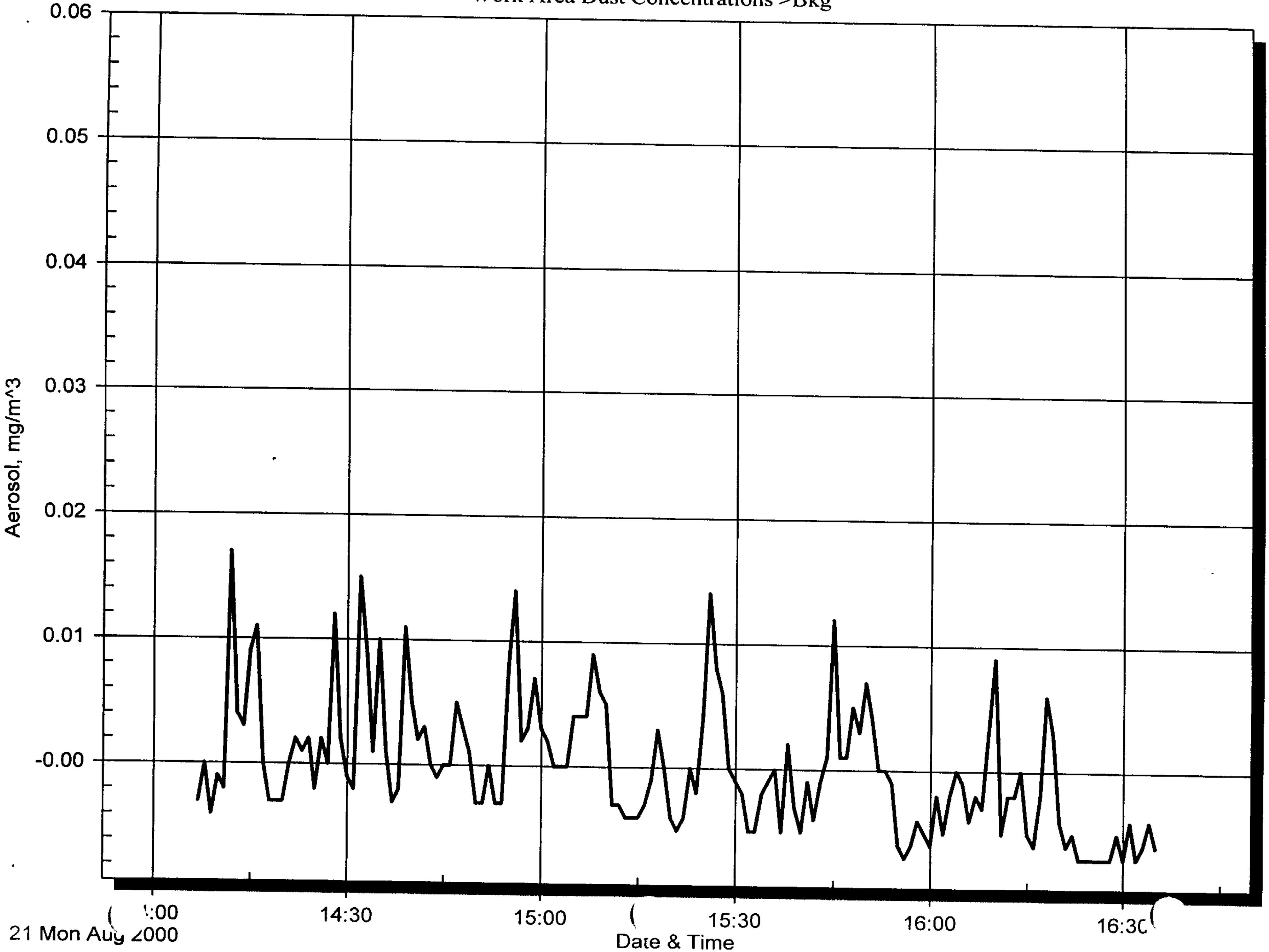
MAYWOOD PILOT PROJECT

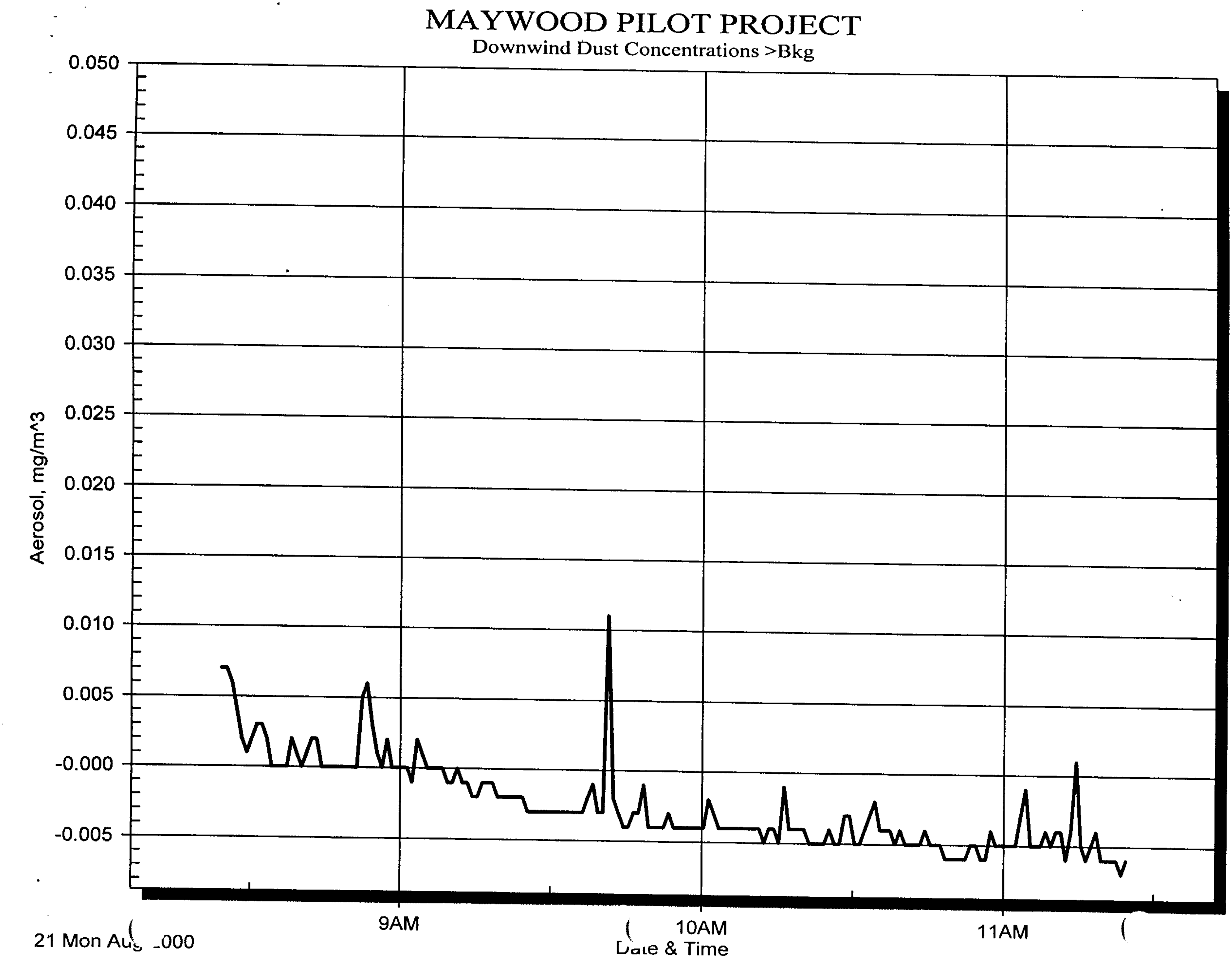
Work Area Dust Concentrations >Bkg



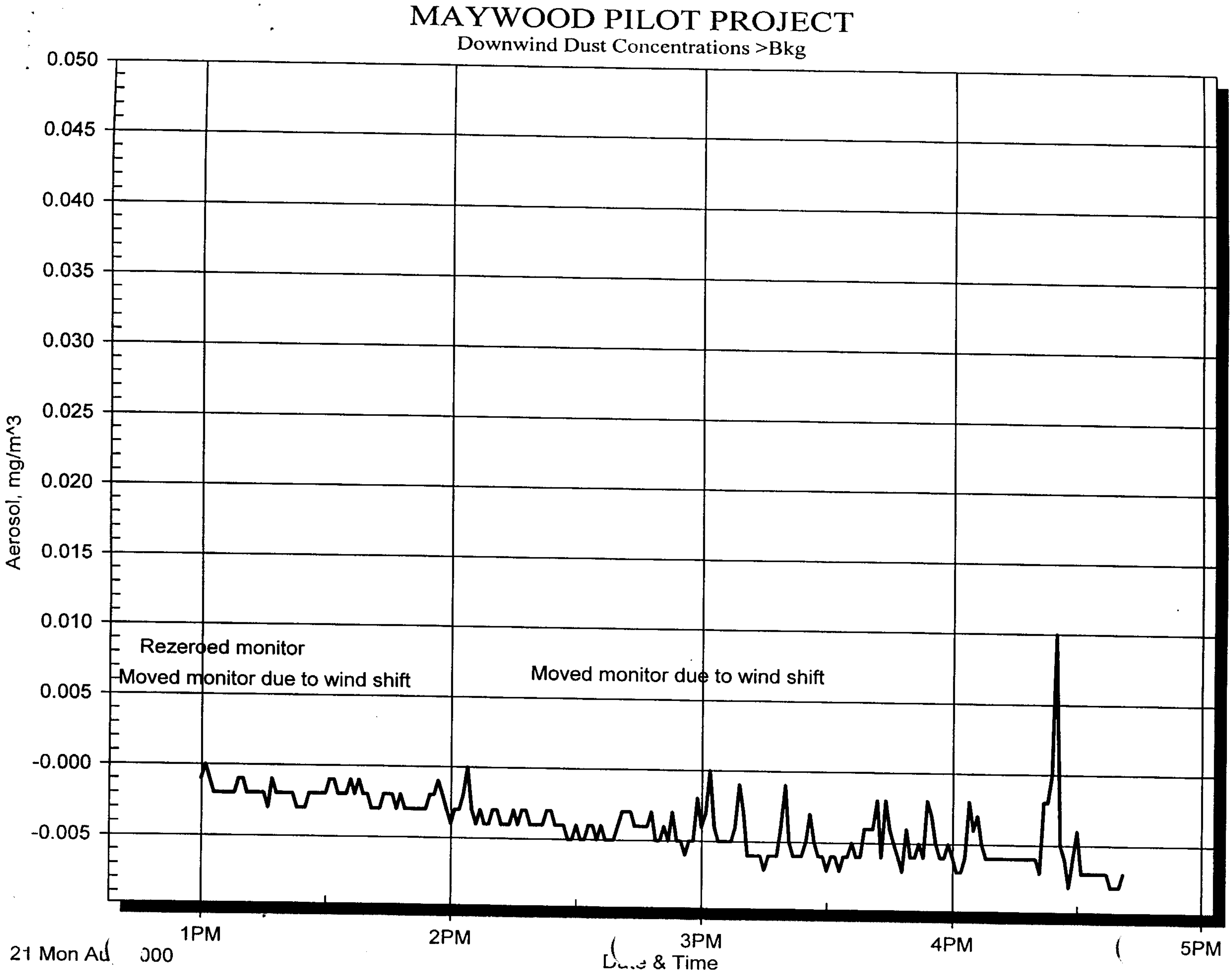
MAYWOOD PILOT PROJECT

Work Area Dust Concentrations >Bkg





MAYWOOD PILOT PROJECT
Downwind Dust Concentrations >Bkg
0.050
0.045
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
-0.000
-0.005
Aerosol, mg/m^3
9AM
10AM
11AM
21 Mon Aug 2000
Date & Time



MAYWOOD PILOT PROJECT
Downwind Dust Concentrations >Bkg
Aerosol, mg/m^3
0.050
0.045
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
-0.000
-0.005
Rezeroed monitor
Moved monitor due to wind shift
Moved monitor due to wind shift
1PM
2PM
3PM
4PM
5PM
Date & Time

AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: Maywood	WEATHER CONDITIONS: Clear Skies Light Breeze from West	DATE: 8/22/00
PERSON PERFORMING MONITORING: RM Coblentz		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See HWP's			Multi-Rae	21804
0015, 0016, & 0017			DUST TRAK	21760
			DUST TRAK	21762

INSTRUMENTS CALIBRATION	PPE IN USE:	PROCESS:
YES [X] NO [ ]	SEE HWP's 15,16,17	PILOT PROJECT / PROCESSING STEPAN STOCKPILE

MONITORING DATA

LOCATION AND REMARKS	DUST mg/m3	TIME	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H_2S (ppm)
Downwind Perimeter	.001	0830	N/A	N/A	N/A	N/A	N/A
Stepan Stockpile	.015	0850	0.3	Ø	21.4	Ø	Ø
Franklin machine	.03	0855	0.1	Ø	21.5	Ø	Ø
Thermo Machine	.05	0900	0.1	Ø	21.5	Ø	Ø
Downwind Perimeter	.004	0915	N/A	N/A	N/A	N/A	N/A
Stepan STOCKPILE	.010	1030	Ø	Ø	~~[illegible]~~ 21.8	Ø	Ø
Downwind Work area	.04	1040	Ø	Ø	21.6	Ø	Ø
STEPAN STOCKPILE	.03	1350	Ø	1	22.0	Ø	Ø
Franklin Machine	.03	1400	Ø	1	22.0	Ø	Ø
Thermo machine	.05	1405	Ø	1	21.8	Ø	Ø
Down wind Perimeter (WIND FROM THE Southeast)	.007	L.E. 1330	~~Ø~~ N/A 8/22/00	N/A	N/A	N/A	N/A
Downwind Perimeter	.002	1530	N/A	N/A	N/A	N/A	N/A

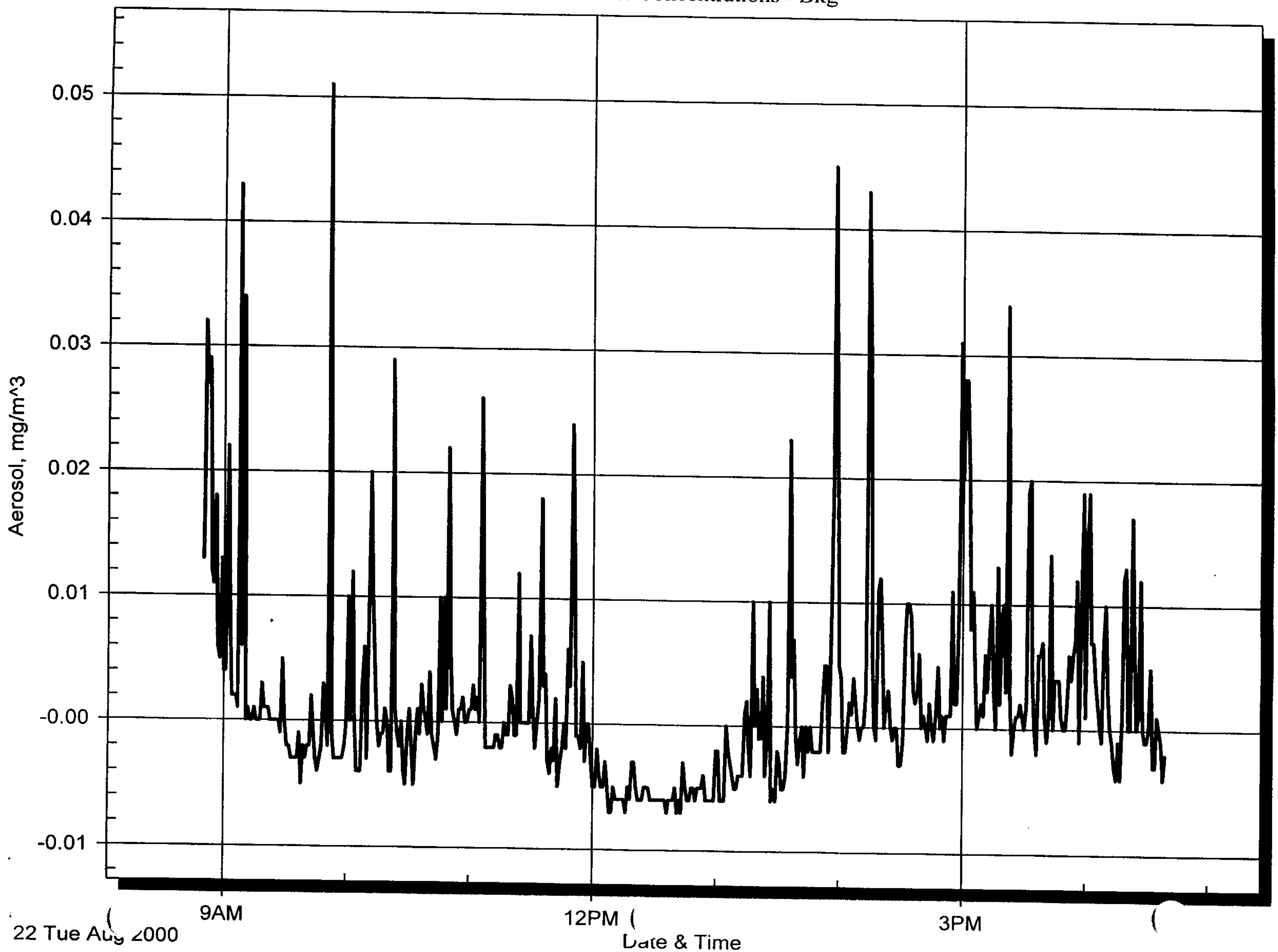
CONTINUED ON REVERSE SIDE

Current Graph:8-22-00PWA
Start time: 08:49:01 08/22/2000   Stop time: 16:39:01 08/22/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	0.002
Lowest point:	-0.007
Time	12:08:01
Date	08/22/2000
Highest point:	0.051
Time	09:52:01
Date	08/22/2000
Log interval: hh:mm:ss	00:01:00

MAYWOOD PILOT STUDY

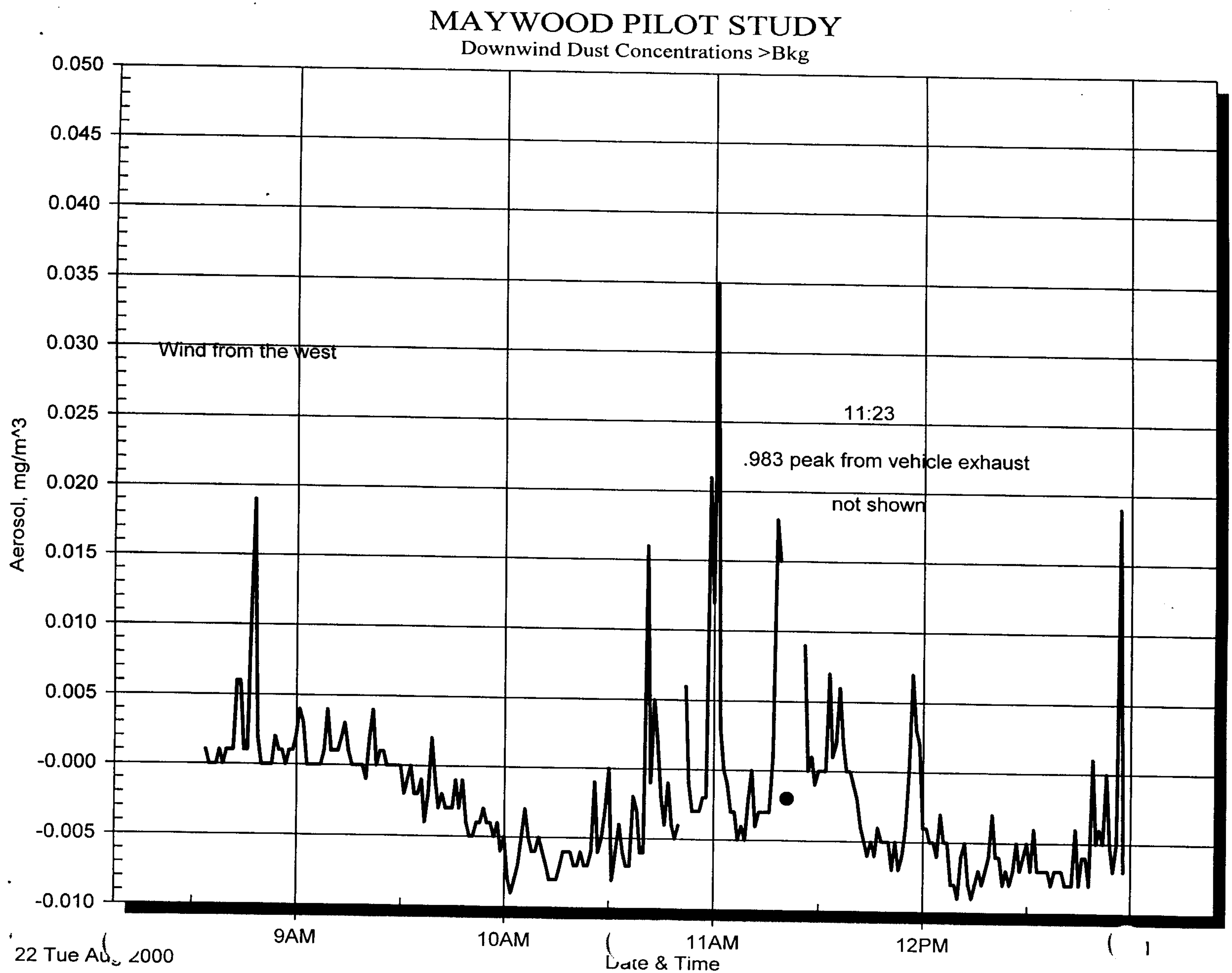
Work Area Dust Concentrations >Bkg



Current Graph:8-22-00DW1

Start time: 08:32:52 08/22/2000 Stop time: 12:57:52 08/22/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	0.010
Lowest point: Time Date	-0.009 10:01:52 08/22/2000
Highest point: Time Date	0.983 11:23:52 08/22/2000
Log interval: hh:mm:ss	00:01:00



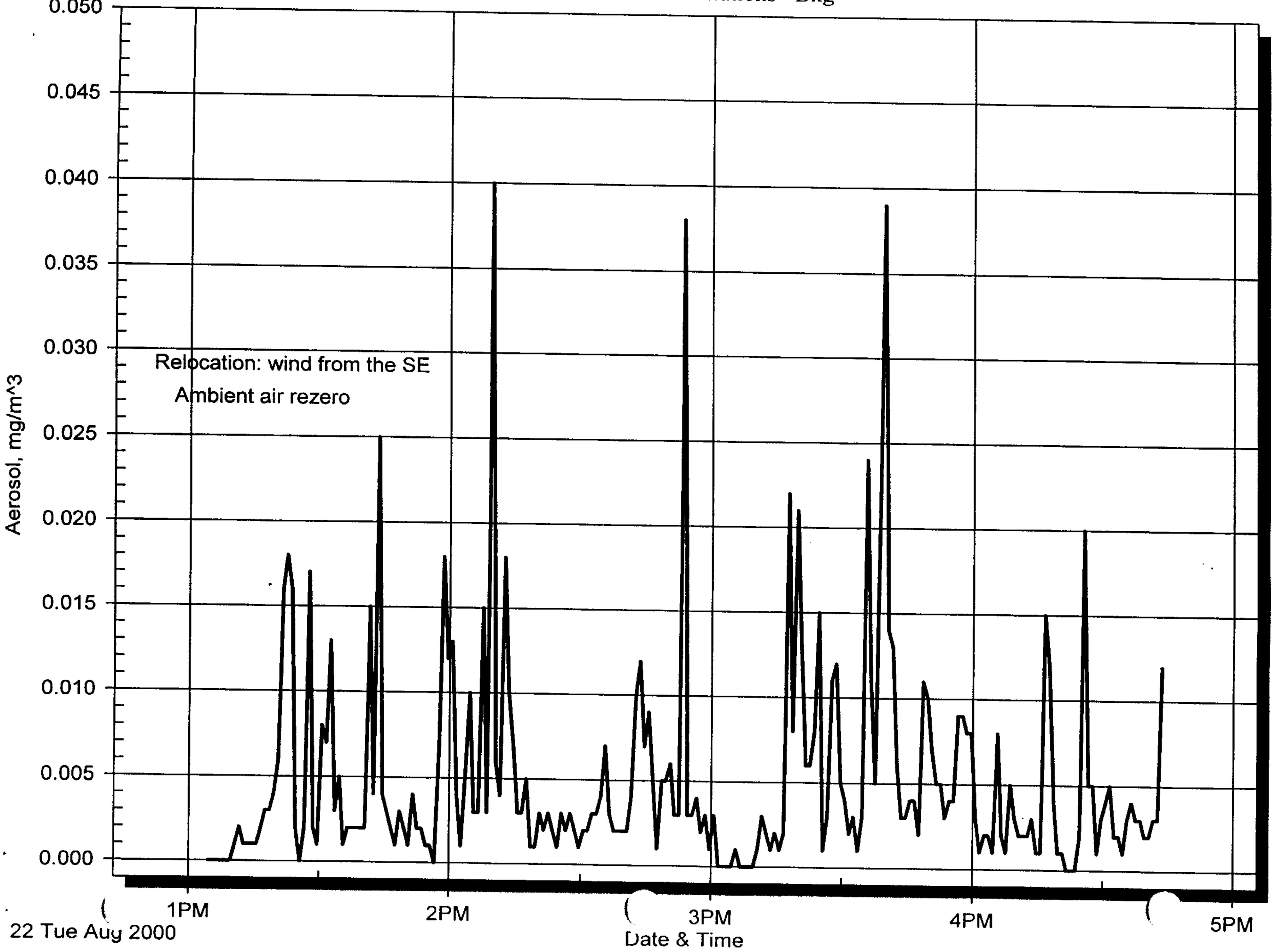
MAYWOOD PILOT STUDY
Downwind Dust Concentrations >Bkg
Aerosol, mg/m^3
0.050
0.045
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
-0.000
-0.005
-0.010
Wind from the west
11:23
.983 peak from vehicle exhaust
not shown
9AM
10AM
11AM
12PM
22 Tue Au 2000
Date & Time

Current Graph:8-22-00DW2
Start time: 13:03:36 08/22/2000 Stop time: 16:43:36 08/22/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	0.005
Lowest point: Time Date	0.000 13:04:36 08/22/2000
Highest point: Time Date	0.040 14:09:36 08/22/2000
Log interval: hh:mm:ss	00:01:00

MAYWOOD PILOT STUDY

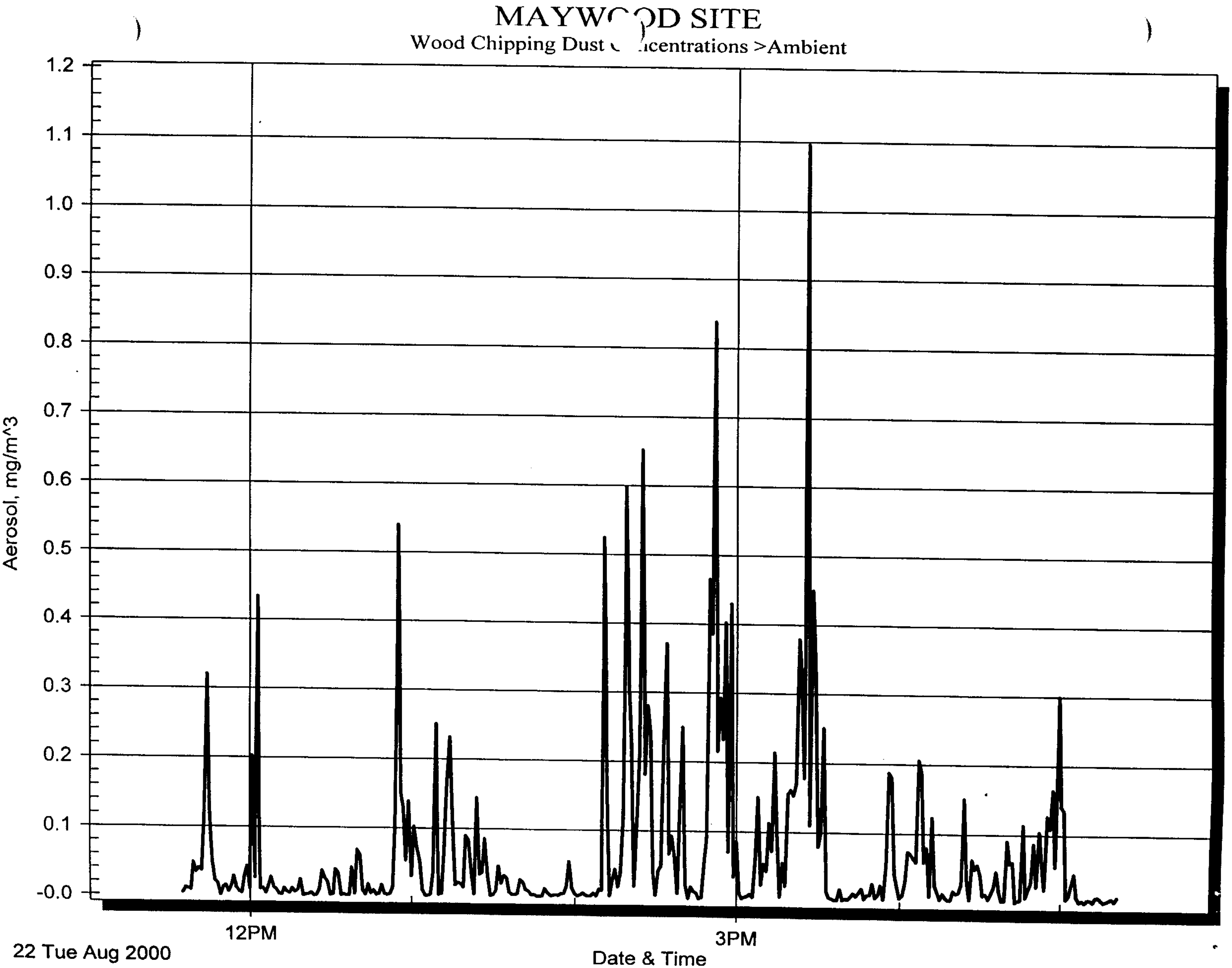
Downwind Dust Concentrations >Bkg



Current Graph:8-22-00wood

Start time: 11:33:55 08/22/2000   Stop time: 17:20:55 08/22/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	0.068
Lowest point: Time Date	0.001 11:48:55 08/22/2000
Highest point: Time Date	1.096 15:25:55 08/22/2000
Log interval: hh:mm:ss	00:01:00


MAYWOOD SITE
Wood Chipping Dust Concentrations >Ambient
Aerosol, mg/m^3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
-0.0
12PM
3PM
22 Tue Aug 2000
Date & Time

AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: Maywood	WEATHER CONDITIONS: South winds AM: Cloudy; PM: Rain	DATE: 8/23/00
PERSON PERFORMING MONITORING: RMCoblentz		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See HWP #0015, 0016, & 0017			Dust Trak	21760
N/A			Dust Trak	21762
			Multi Rae	21810

INSTRUMENTS CALIBRATION	PPE IN USE:	PROCESS:
YES [X] NO [ ]	See HWP 15, 16, 17	Pilot Project

(Processing started @ 1300 hrs.)

MONITORING DATA

LOCATION AND REMARKS	Dust mg/m3	TIME	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H_2S (ppm)
Stepan stockpile (scooping)	0.05	1310	Ø	Ø	21.7	Ø	Ø
Thermo separator	0.003	1315	Ø	Ø	21.5	Ø	Ø
Whitney separator	0.004	1315	Ø	Ø	21.5	Ø	Ø
Downwind perimeter	0.01 – ~~0.20~~ 0.028 8/23/00	1340	N/A	N/A	N/A	N/A	N/A
Downwind perimeter average	.002	1345	N/A	N/A	N/A	N/A	N/A
Monitoring Secured @	1430	Due to Rain	— RMC				
N/A							

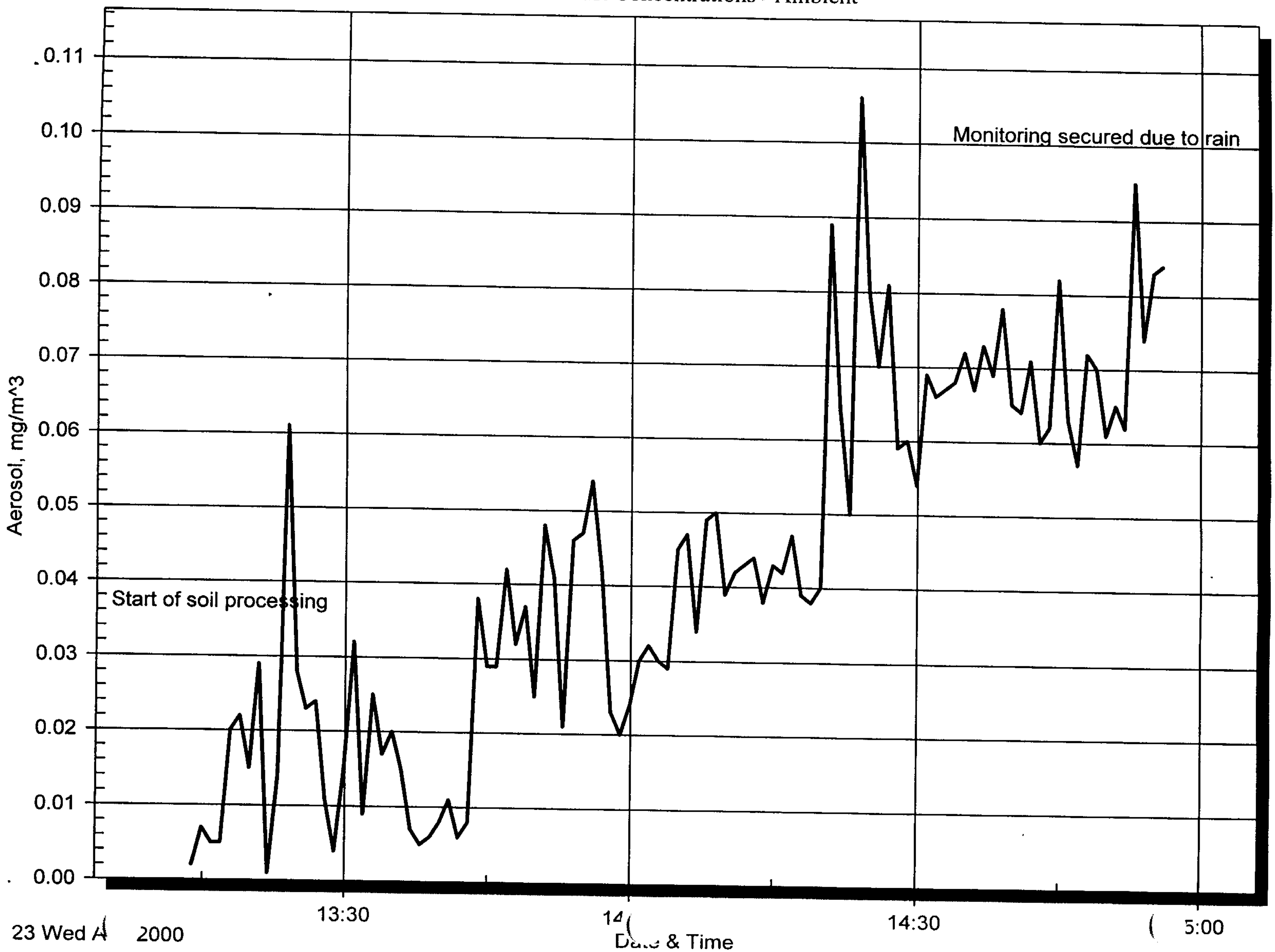
CONTINUED ON REVERSE SIDE

Current Graph:8-23-00PWA
Start time: 13:12:53 08/23/2000   Stop time: 14:55:53 08/23/2000

Legend:	Aerosol
Channel:	Aerosol
(Units)	mg/m^3
Average:	0.043
Lowest point:	0.001
Time	13:21:53
Date	08/23/2000
Highest point:	0.106
Time	14:23:53
Date	08/23/2000
Log interval: hh:mm:ss	00:01:00

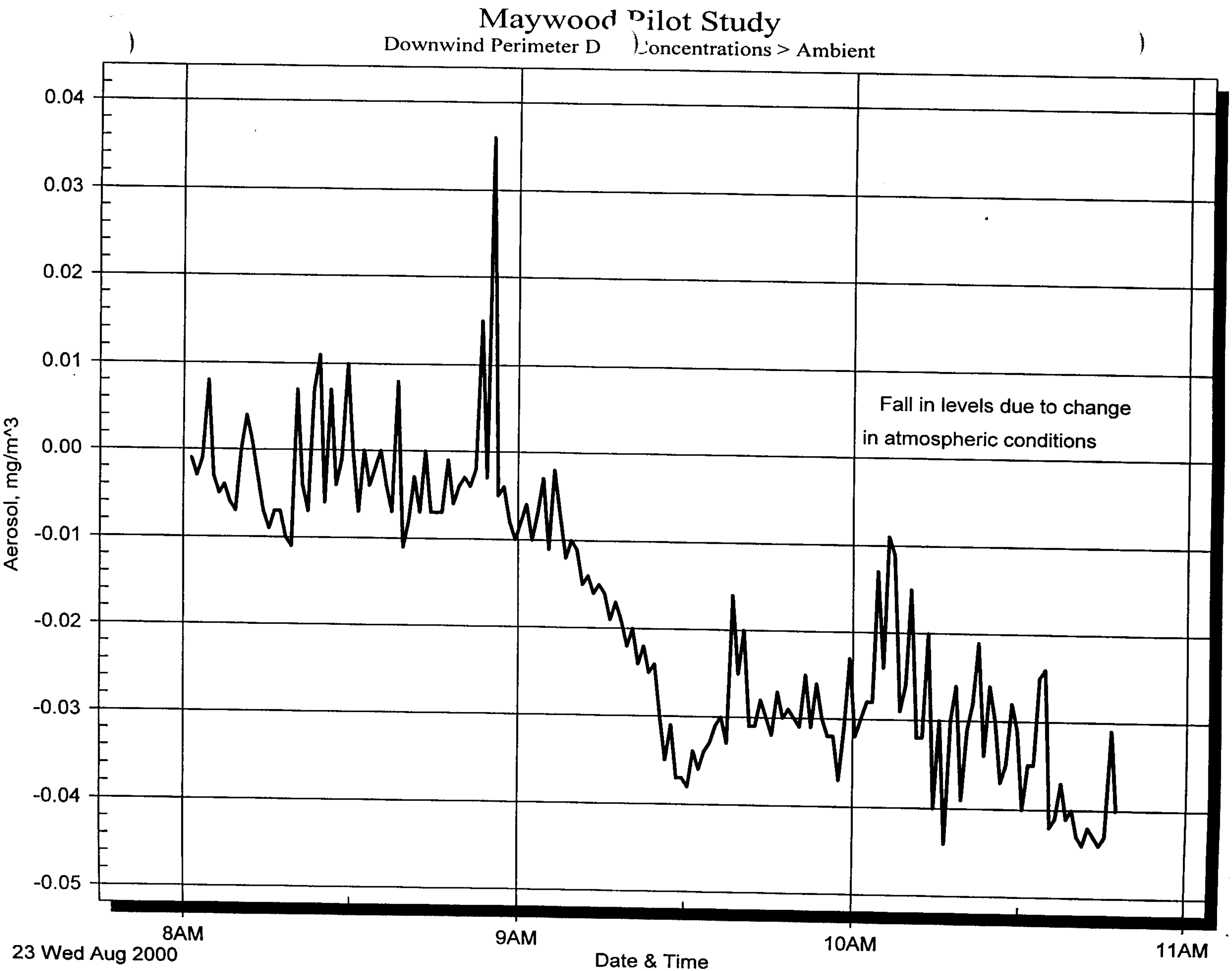
Maywood Pilot Study

Work Area Dust Concentrations >Ambient



Current Graph:8-23-00PDW1
Start time: 08:00:28 08/23/2000 Stop time: 10:47:28 08/23/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	-0.018
Lowest point: Time Date	-0.044 10:16:28 08/23/2000
Highest point: Time Date	0.036 08:55:28 08/23/2000
Log interval: hh:mm:ss	00:01:00



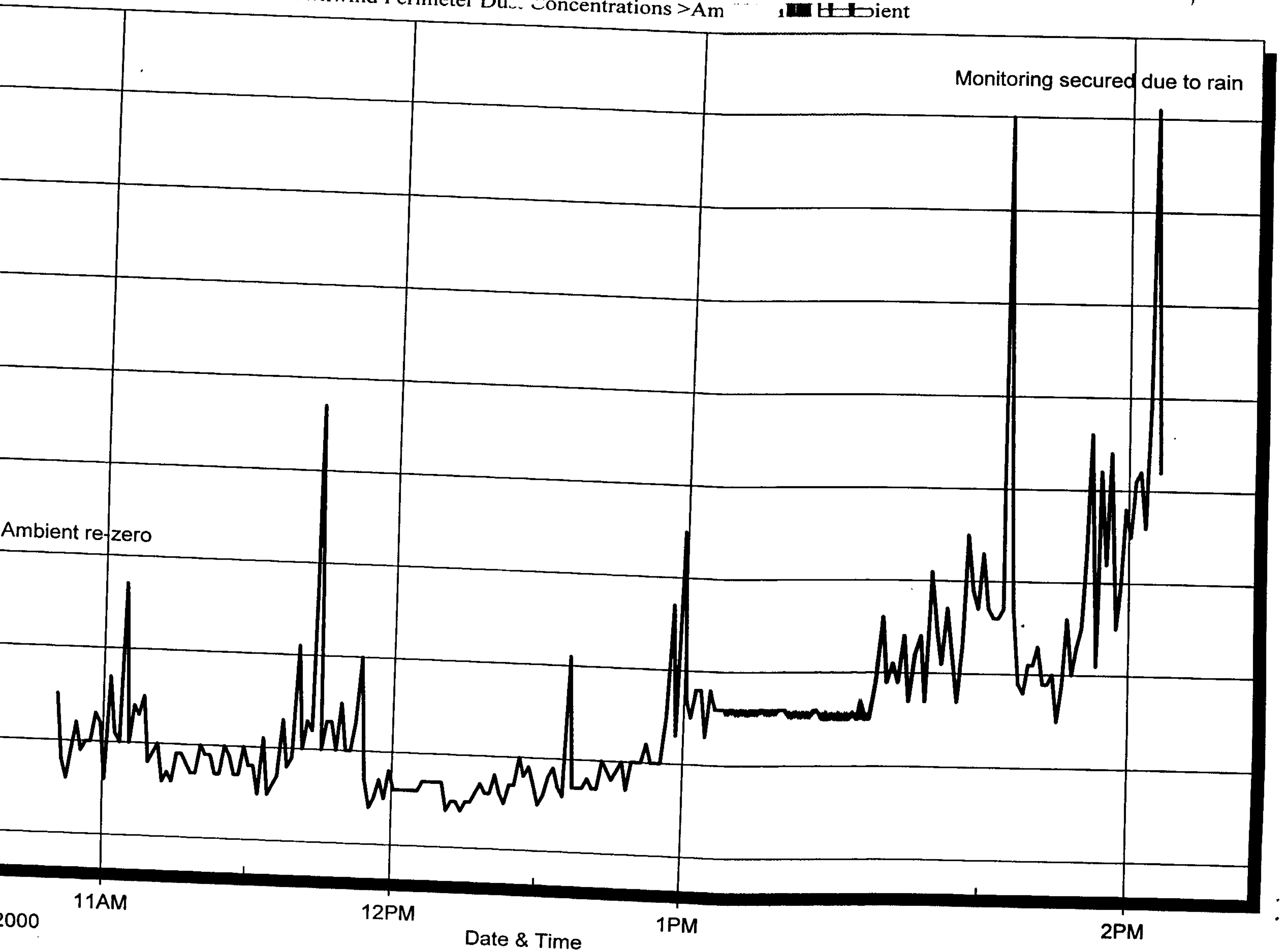
Maywood Pilot Study
Downwind Perimeter D Concentrations > Ambient
0.04
0.03
0.02
0.01
0.00
-0.01
-0.02
-0.03
-0.04
-0.05
Aerosol, mg/m^3
Fall in levels due to change
in atmospheric conditions
8AM
9AM
10AM
11AM
23 Wed Aug 2000
Date & Time

Current Graph:8-23-00PDW2
Start time: 10:49:24 08/23/2000 Stop time: 14:06:24 08/23/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	0.005
Lowest point:	-0.006
Time	11:55:24
Date	08/23/2000
Highest point:	0.071
Time	14:05:24
Date	08/23/2000
Log interval: hh:mm:ss	00:01:00

Maywood Pilot Study

Downwind Perimeter Dust Concentrations >Ambient



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FORECAST AND CURRENT CONDITIONS

Maywood, NJ (07607)

CURRENTLY

as reported at Teterboro, NJ.
Last updated Friday, August 25, at 7:10 AM Eastern Daylight Time

Fair

Temp: 63°F
Wind: From the North at 6 mph
Dewpoint: 59°F
Rel. Humidity: 87%
Visibility: 8 miles
Barometer: 30.04 inches
Sunrise: 6:16 am
Sunset: 7:38 pm

Detailed Local Forecast
Regional Audio Forecast
Regional Severe Weather Alerts

7-DAY FORECAST

last updated Friday, August 25, at 6:15 AM Eastern Daylight Time

TODAY	Partly Cloudy	hi 84°F	lo 63°F
SAT	Partly Cloudy	hi 85°F	lo 65°F
SUN	Partly Cloudy	hi 85°F	lo 64°F
MON	Partly Cloudy	hi 87°F	lo 64°F
TUE	Partly Cloudy	hi 87°F	lo 65°F
WED	Partly Cloudy	hi 88°F	lo 65°F
THU	Partly Cloudy	hi 88°F	lo 65°F

Temp. converter: Enter a number and click outside the box
F: C: reset

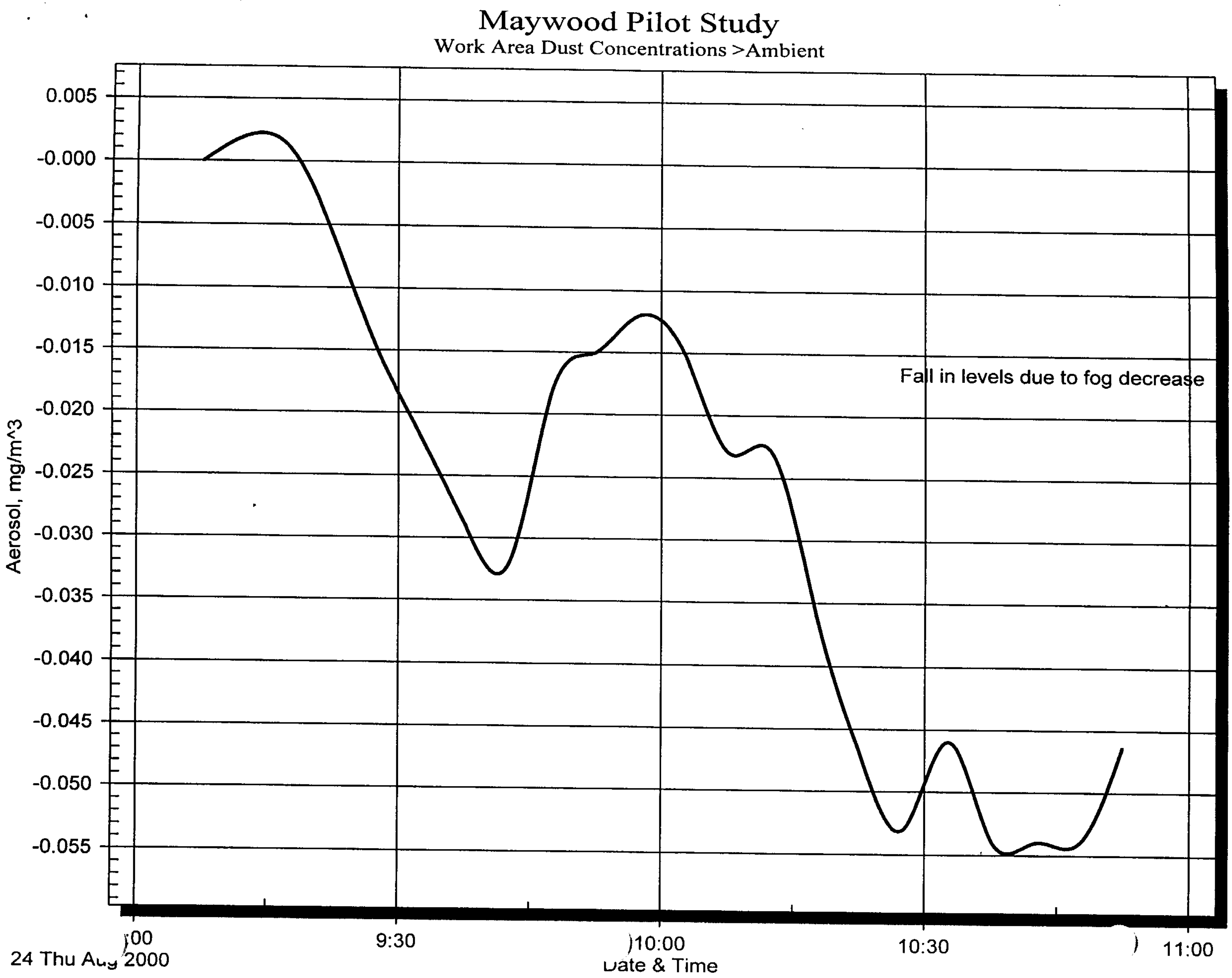
Send us your feedback about this page

LOCAL LINKS

7-day forecast
Detailed Local Forecast
Regional Audio Forecast
Regional Severe Weather Alerts

Current Graph:8-24-00 Pilot W/A1
Start time: 09:02:37 08/24/2000   Stop time: 10:52:37 08/24/2000

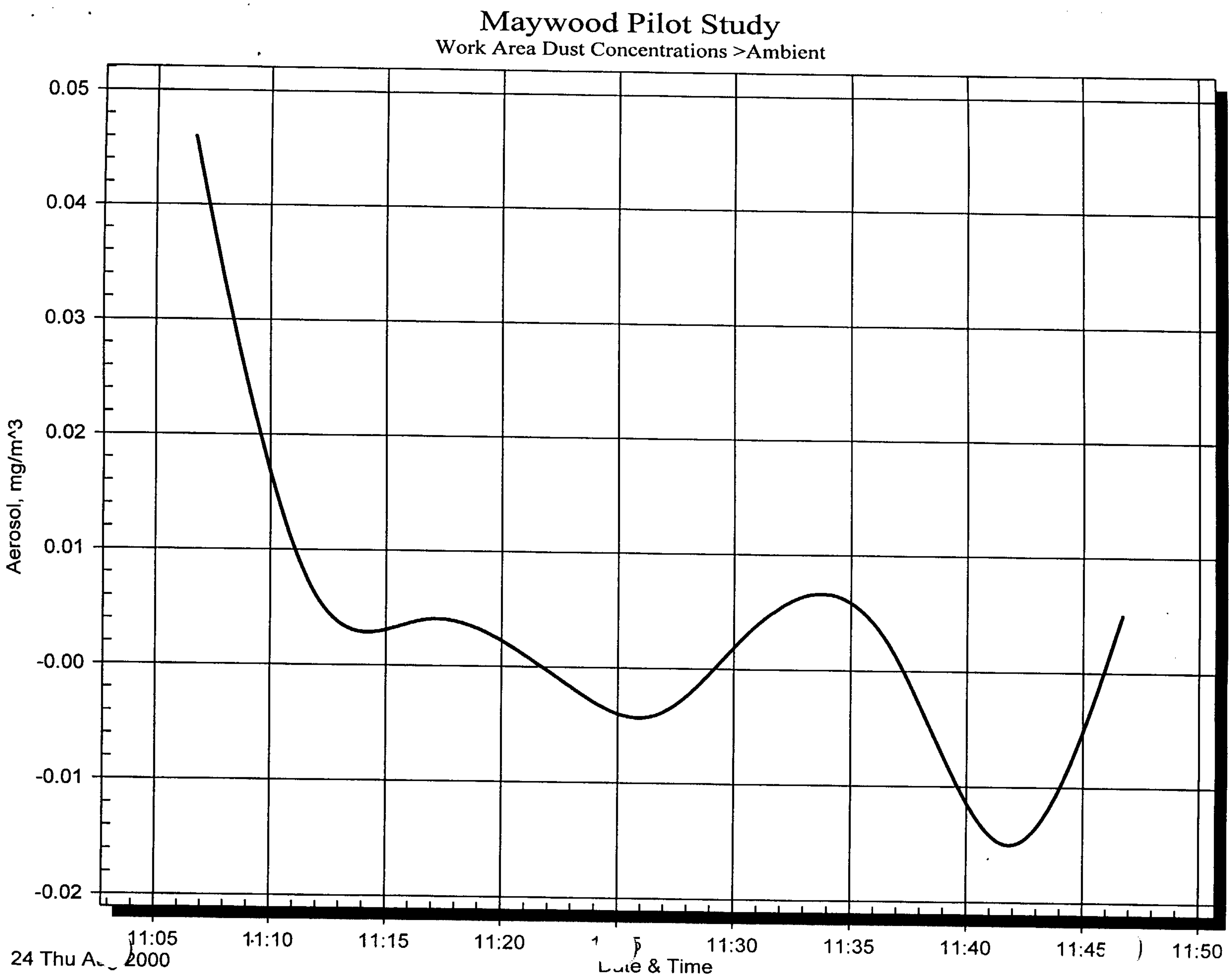
Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	-0.027
Lowest point:	-0.054
Time	10:37:37
Date	08/24/2000
Highest point:	0.002
Time	09:12:37
Date	08/24/2000
Log interval: hh:mm:ss	00:05:00



Maywood Pilot Study
Work Area Dust Concentrations >Ambient
Aerosol, mg/m^3
0.005
-0.000
-0.005
-0.010
-0.015
-0.020
-0.025
-0.030
-0.035
-0.040
-0.045
-0.050
-0.055
Fall in levels due to fog decrease
9:30
10:00
10:30
11:00
24 Thu Aug 2000
Date & Time

Current Graph:8-24-00 Pilot W/A 2
Start time: 11:01:43 08/24/2000   Stop time: 11:46:43 08/24/2000

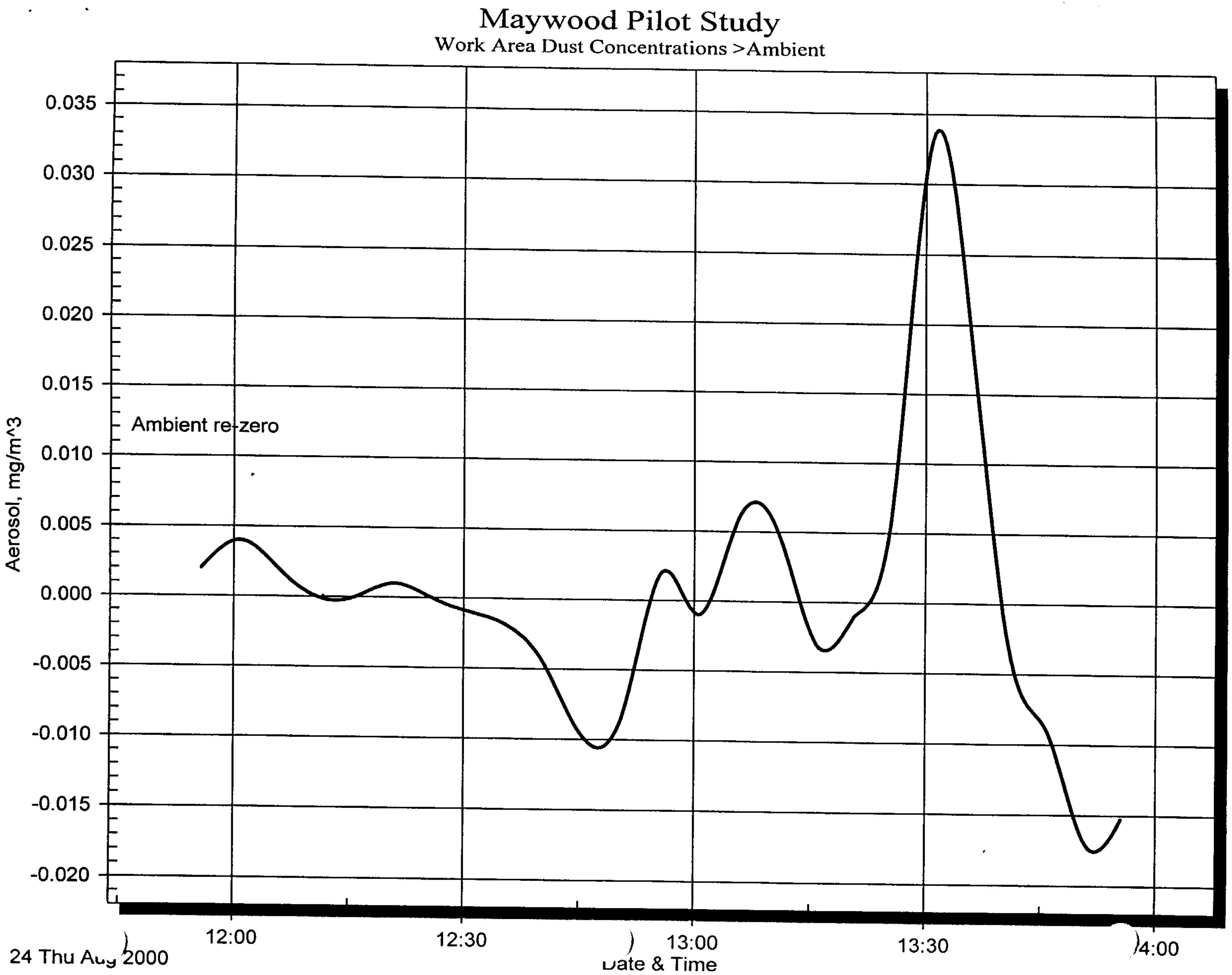
Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	0.006
Lowest point:	-0.015
Time	11:41:43
Date	08/24/2000
Highest point:	0.046
Time	11:06:43
Date	08/24/2000
Log interval: hh:mm:ss	00:05:00



Maywood Pilot Study
Work Area Dust Concentrations >Ambient
Aerosol, mg/m^3
0.05
0.04
0.03
0.02
0.01
-0.00
-0.01
-0.02
11:05
11:10
11:15
11:20
11:30
11:35
11:40
11:45
11:50
24 Thu Aug 2000
Date & Time

Current Graph:8-24-00 Pilot W/A 3
Start time: 11:50:47 08/24/2000 Stop time: 13:55:47 08/24/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	0.000
Lowest point: Time Date	-0.017 13:50:47 08/24/2000
Highest point: Time Date	0.033 13:30:47 08/24/2000
Log interval: hh:mm:ss	00:05:00



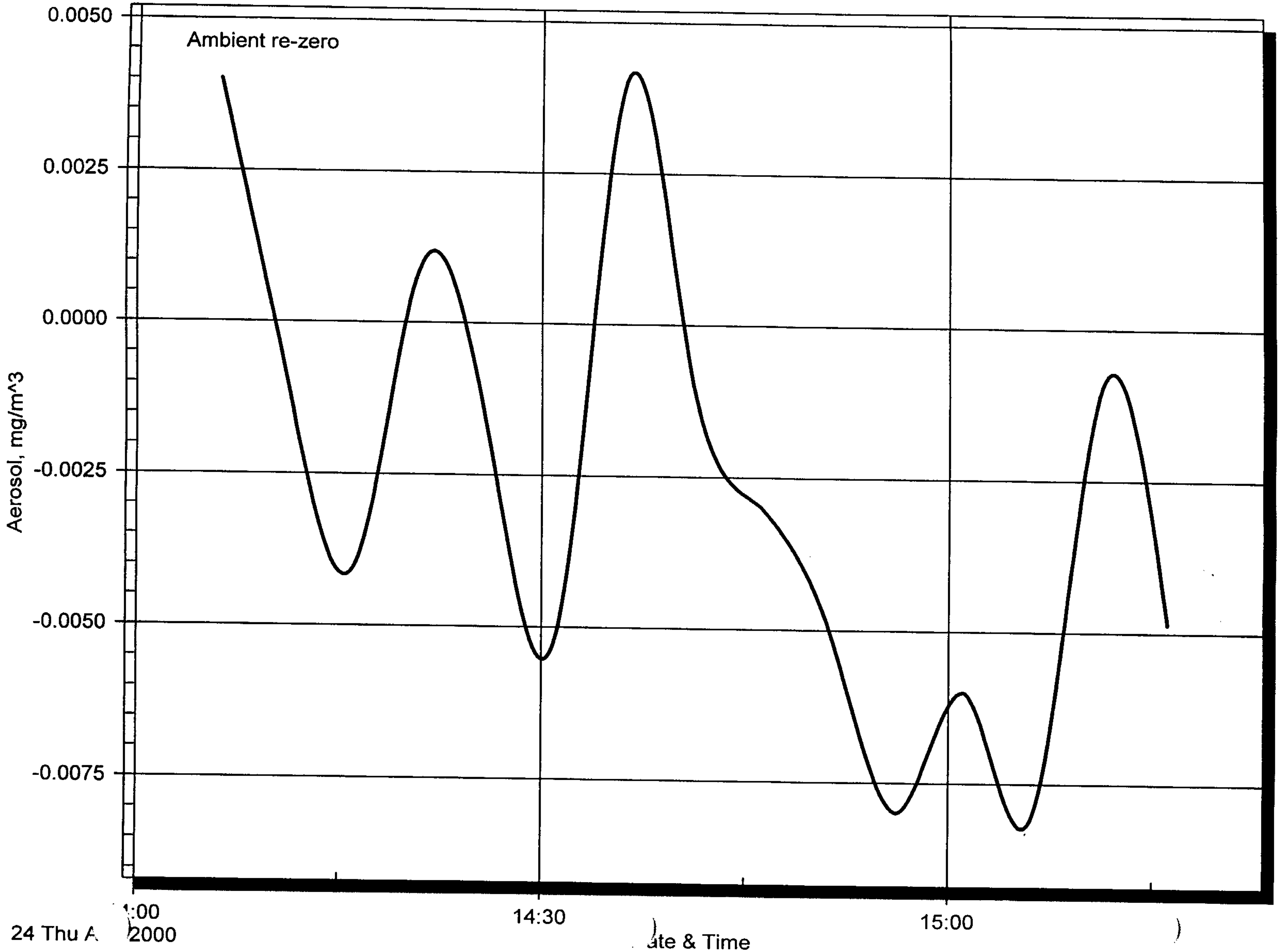
Maywood Pilot Study
Work Area Dust Concentrations >Ambient
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
-0.005
-0.010
-0.015
-0.020
Aerosol, mg/m^3
Ambient re-zero
12:00
12:30
13:00
13:30
4:00
24 Thu Aug 2000
Date & Time

Current Graph:8-24-00 Pilot W/A 4
Start time: 14:01:11 08/24/2000 Stop time: 15:16:11 08/24/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	-0.003
Lowest point:	-0.008
Time	14:56:11
Date	08/24/2000
Highest point:	0.004
Time	14:06:11
Date	08/24/2000
Log interval: hh:mm:ss	00:05:00

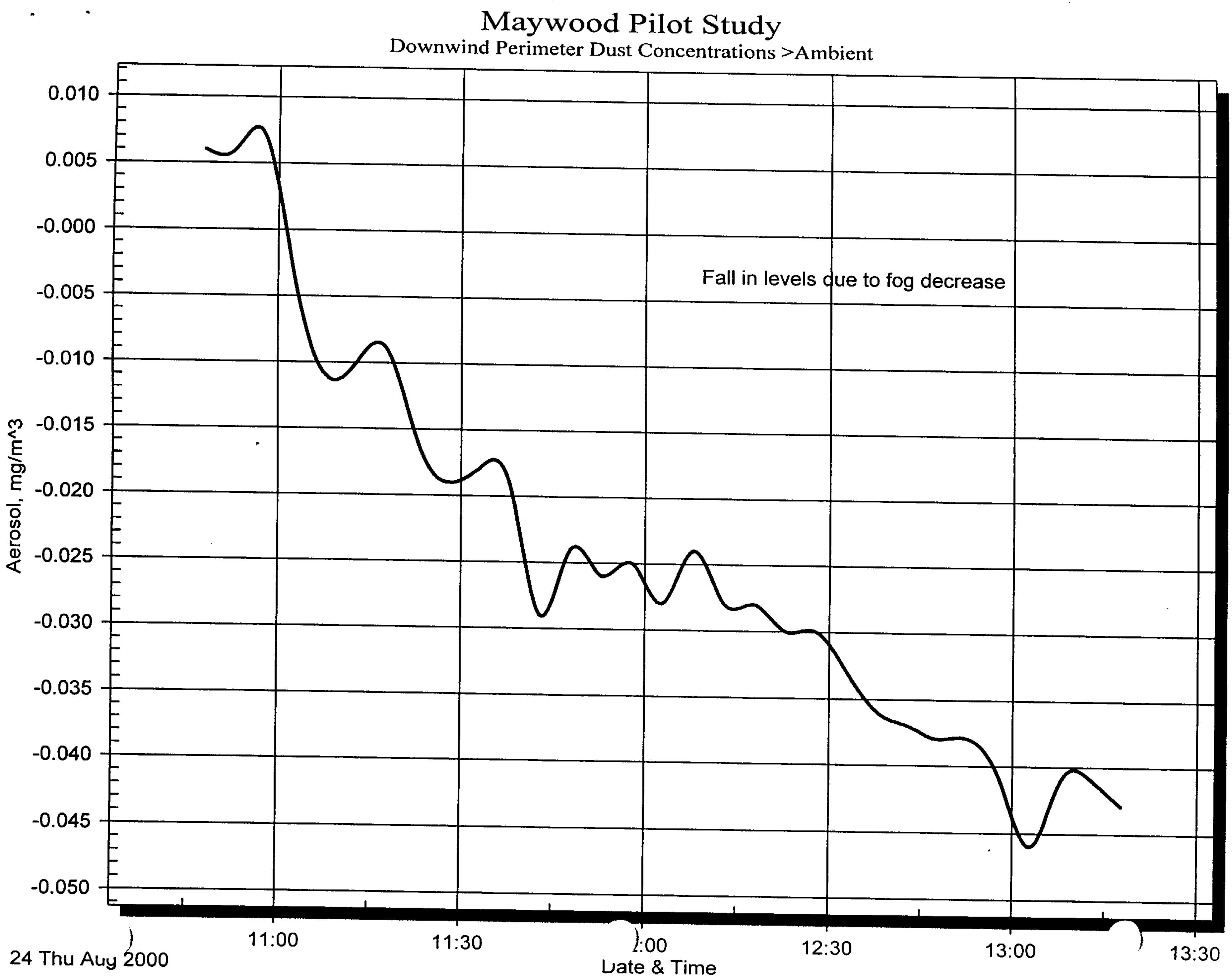
Maywood Pilot Study

Work Area Dust Concentrations >Ambient



Current Graph:8-24-00 Pilot D/W 1
Start time: 10:42:52 08/24/2000   Stop time: 13:17:52 08/24/2000

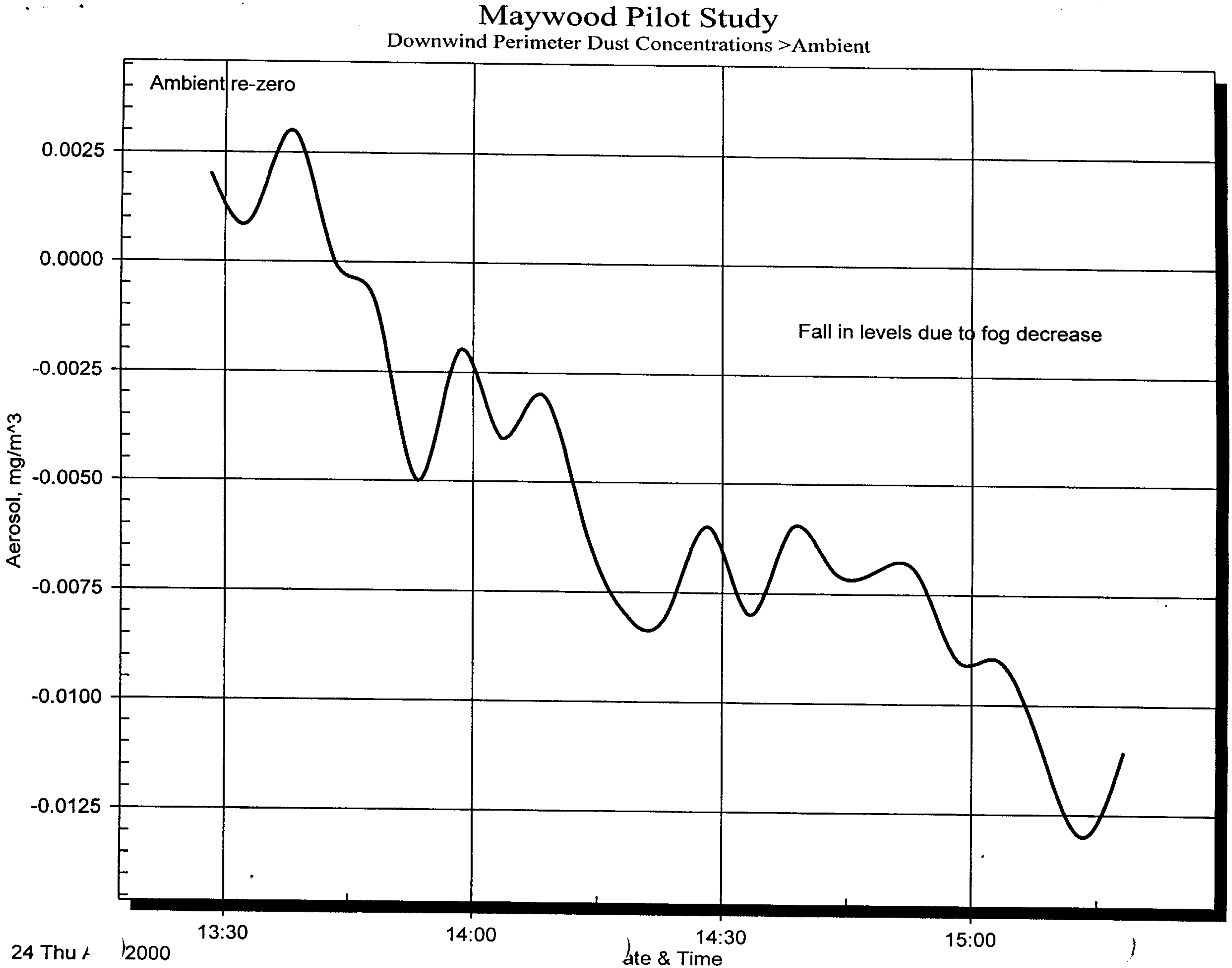
Legend:	Aerosol
Channel:	Aerosol
(Units)	mg/m^3
Average:	-0.024
Lowest point:	-0.046
Time	13:02:52
Date	08/24/2000
Highest point:	0.007
Time	10:57:52
Date	08/24/2000
Log interval:	00:05:00
hh:mm:ss	



Maywood Pilot Study
Downwind Perimeter Dust Concentrations >Ambient
Aerosol, mg/m^3
0.010
0.005
-0.000
-0.005
-0.010
-0.015
-0.020
-0.025
-0.030
-0.035
-0.040
-0.045
-0.050
Fall in levels due to fog decrease
11:00
11:30
:00
12:30
13:00
13:30
24 Thu Aug 2000
Date & Time

Current Graph:8-24-00 Pilot D/W 2
Start time: 13:23:19 08/24/2000 Stop time: 15:18:19 08/24/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	-0.005
Lowest point:	-0.013
Time	15:13:19
Date	08/24/2000
Highest point:	0.003
Time	13:38:19
Date	08/24/2000
Log interval: hh:mm:ss	00:05:00


Maywood Pilot Study
Downwind Perimeter Dust Concentrations >Ambient
Ambient re-zero
Fall in levels due to fog decrease
Aerosol, mg/m^3
0.0025
0.0000
-0.0025
-0.0050
-0.0075
-0.0100
-0.0125
13:30
14:00
14:30
15:00
ate & Time

24 Thu /)2000

AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: FMSS (PILOT)	WEATHER CONDITIONS: FOG / AFTERNOON SHOWER	DATE: 8/28/00
PERSON PERFORMING MONITORING: RM Coblentz		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See HWP 14,15,16,17			Multi-Rae	21804
N/A			DUST TRAK	21760
			DUST TRAK	21762
			N/A	

INSTRUMENTS CALIBRATION	PPE IN USE:	PROCESS:
YES [✓] NO [ ]	See HWP	Processing STEPAN Stockpile

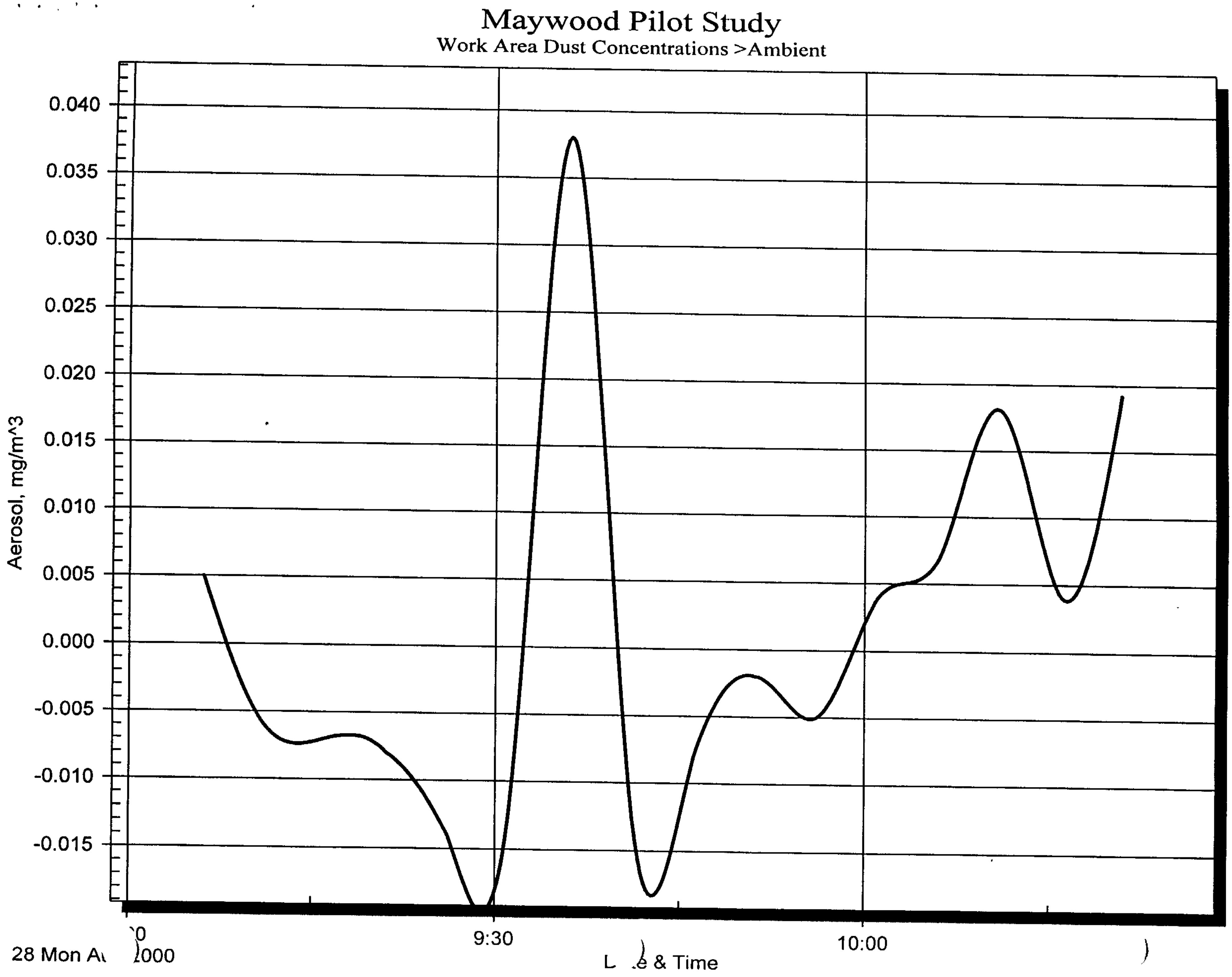
MONITORING DATA

LOCATION AND REMARKS	TIME	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H_2S (ppm)	DUST mg/m³
STEPAN Pile & Process areas	1030	0.1	3	21.1	Ø	Ø	0.2
STEPAN Pile & Process areas	1400	Ø	Ø	20.9	Ø	Ø	0.2
Downwind Perimeter	1330	N/A	N/A	N/A	N/A	N/A	0.03
STATIONARY Work area monitoring	SEE GRAPHS	N/A	N/A	N/A	N/A	N/A	SEE GRAPHS
Downwind Perimeter	See GRAPHS	N/A	N/A	N/A	N/A	N/A	SEE GRAPHS
N/A							

CONTINUED ON REVERSE SIDE

Current Graph:8-28-00PilotW/A1
Start time: 09:01:08 08/28/2000 Stop time: 10:21:08 08/28/2000

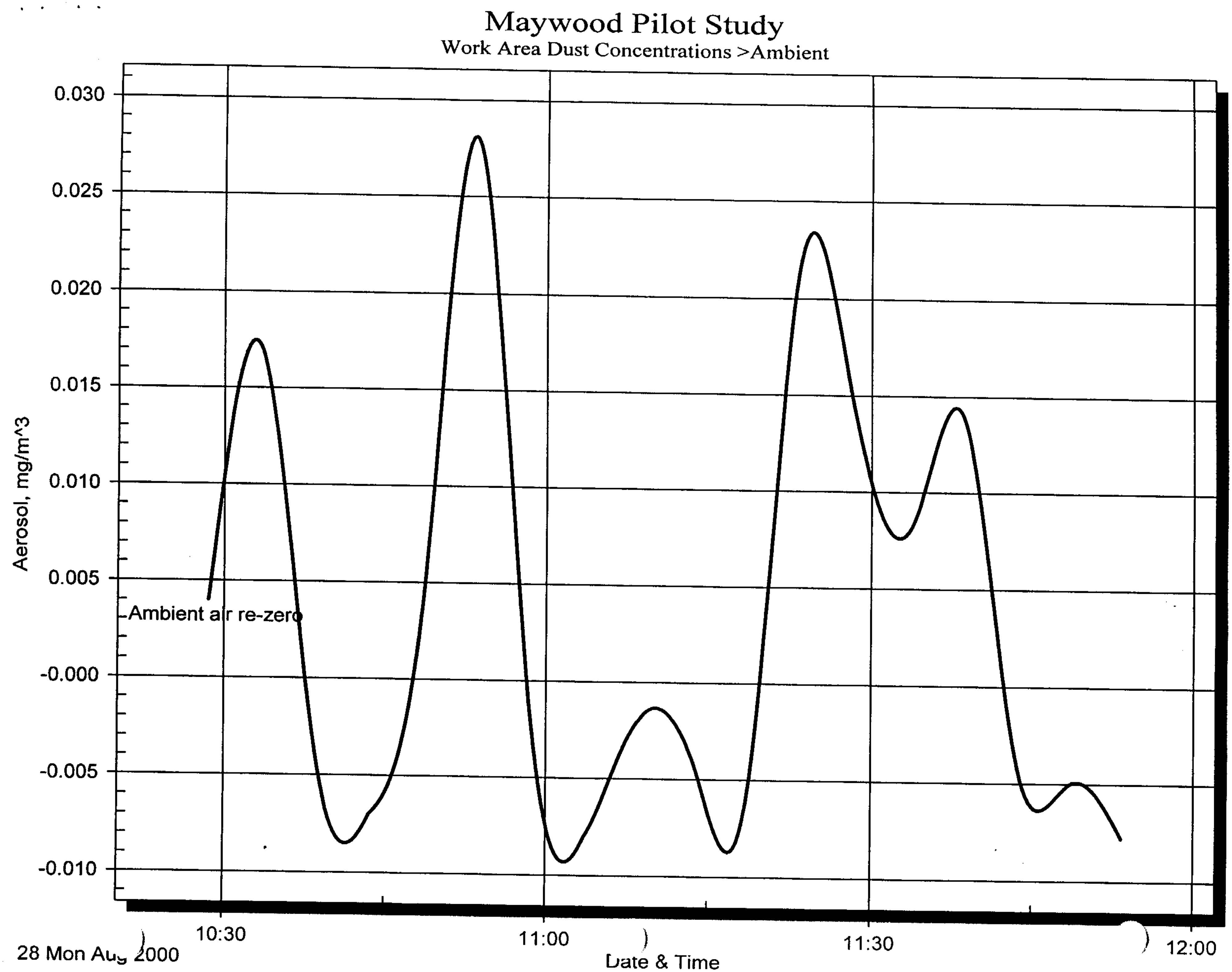
Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	0.001
Lowest point:	-0.014
Time	09:26:08
Date	08/28/2000
Highest point:	0.038
Time	09:36:08
Date	08/28/2000
Log interval: hh:mm:ss	00:05:00



Maywood Pilot Study
Work Area Dust Concentrations >Ambient
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
-0.005
-0.010
-0.015
Aerosol, mg/m^3
`0
9:30
10:00
28 Mon A\ )000
L .e & Time

Current Graph:8-28-00PilotW/A2
Start time: 10:23:33 08/28/2000 Stop time: 11:53:33 08/28/2000

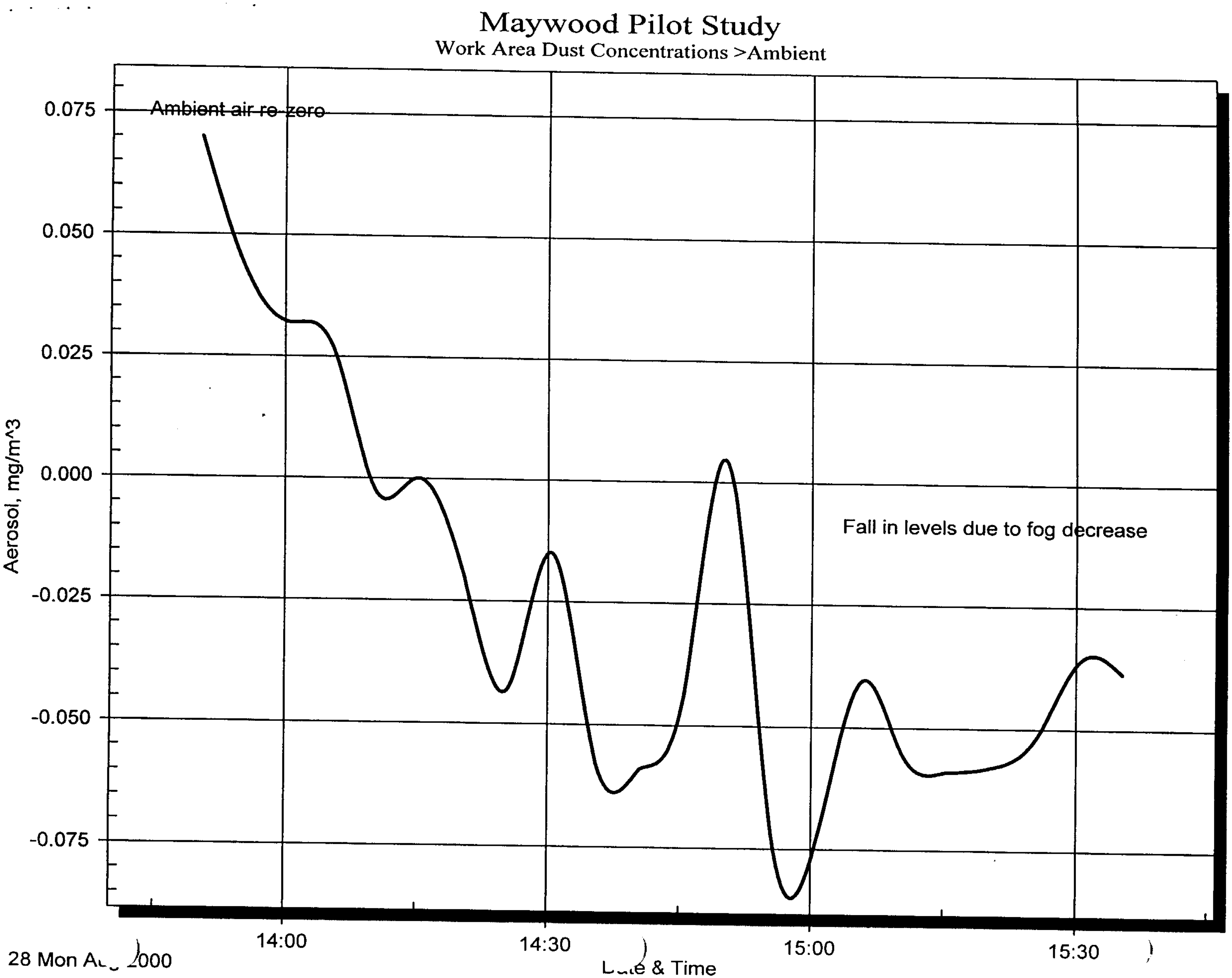
Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	0.003
Lowest point:	-0.008
Time	11:03:33
Date	08/28/2000
Highest point:	0.028
Time	10:53:33
Date	08/28/2000
Log interval: hh:mm:ss	00:05:00



Maywood Pilot Study
Work Area Dust Concentrations >Ambient
0.030
0.025
0.020
0.015
0.010
0.005
-0.000
-0.005
-0.010
Aerosol, mg/m^3
Ambient air re-zero
10:30
11:00
11:30
12:00
28 Mon Aug 2000
Date & Time

Current Graph:8-28-00PilotW/A3
Start time: 13:45:28 08/28/2000 Stop time: 15:35:28 08/28/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	-0.025
Lowest point:	-0.074
Time	15:00:28
Date	08/28/2000
Highest point:	0.070
Time	13:50:28
Date	08/28/2000
Log interval: hh:mm:ss	00:05:00



Maywood Pilot Study
Work Area Dust Concentrations >Ambient
Ambient air re-zero
Fall in levels due to fog decrease
0.075
0.050
0.025
0.000
-0.025
-0.050
-0.075
Aerosol, mg/m^3
14:00
14:30
15:00
15:30
28 Mon Au 2000
Date & Time

Current Graph:8-28-00PilotW/A4
Start time: 15:39:12 08/28/2000 Stop time: 17:19:12 08/28/2000

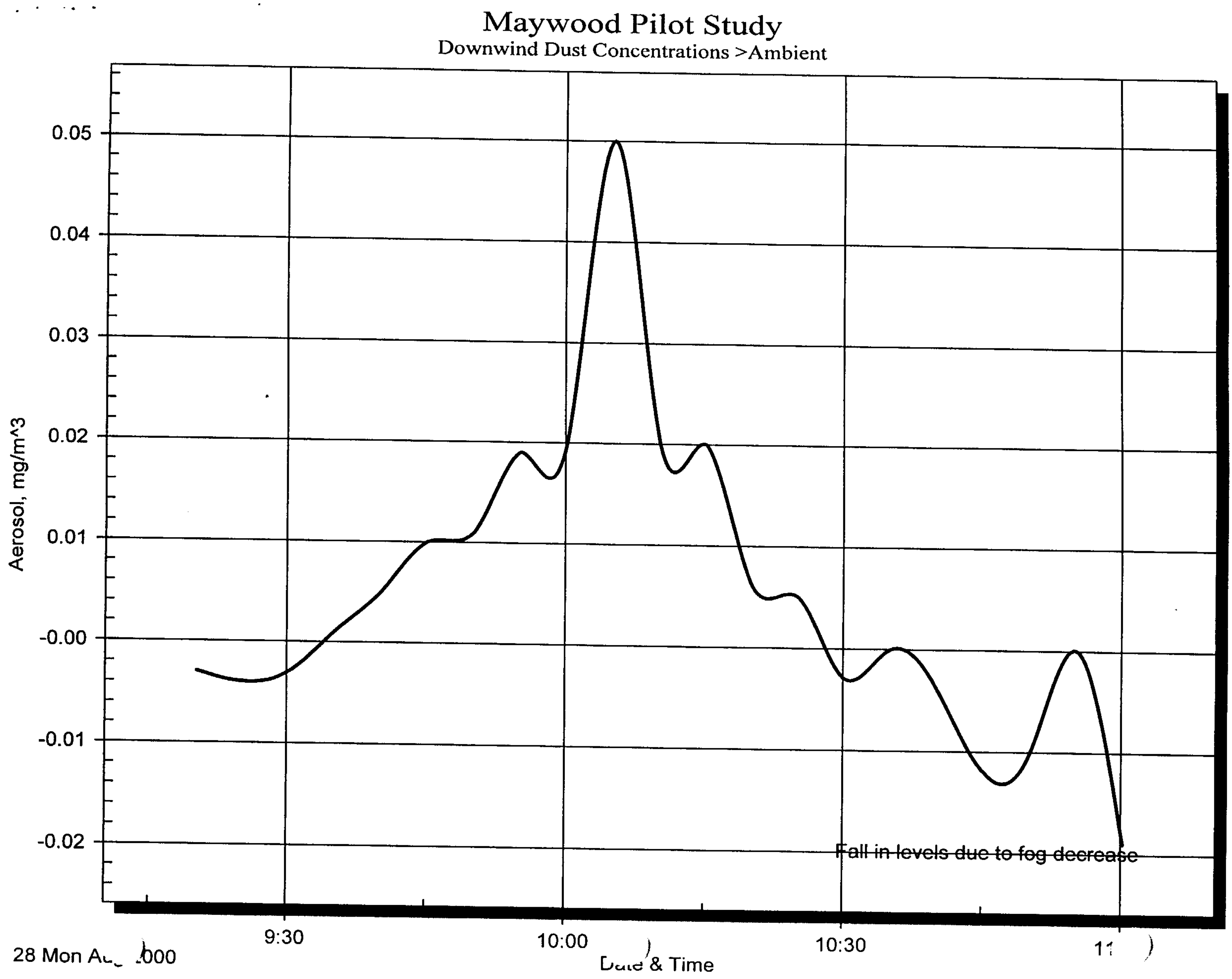
Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	0.000
Lowest point: Time Date	-0.014 16:44:12 08/28/2000
Highest point: Time Date	0.022 15:59:12 08/28/2000
Log interval: hh:mm:ss	00:05:00

Current Graph:8-28-00PilotW/A4
Start time: 15:39:12 08/28/2000 Stop time: 17:19:12 08/28/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	0.000
Lowest point:	-0.014
Time	16:44:12
Date	08/28/2000
Highest point:	0.022
Time	15:59:12
Date	08/28/2000
Log interval: hh:mm:ss	00:05:00

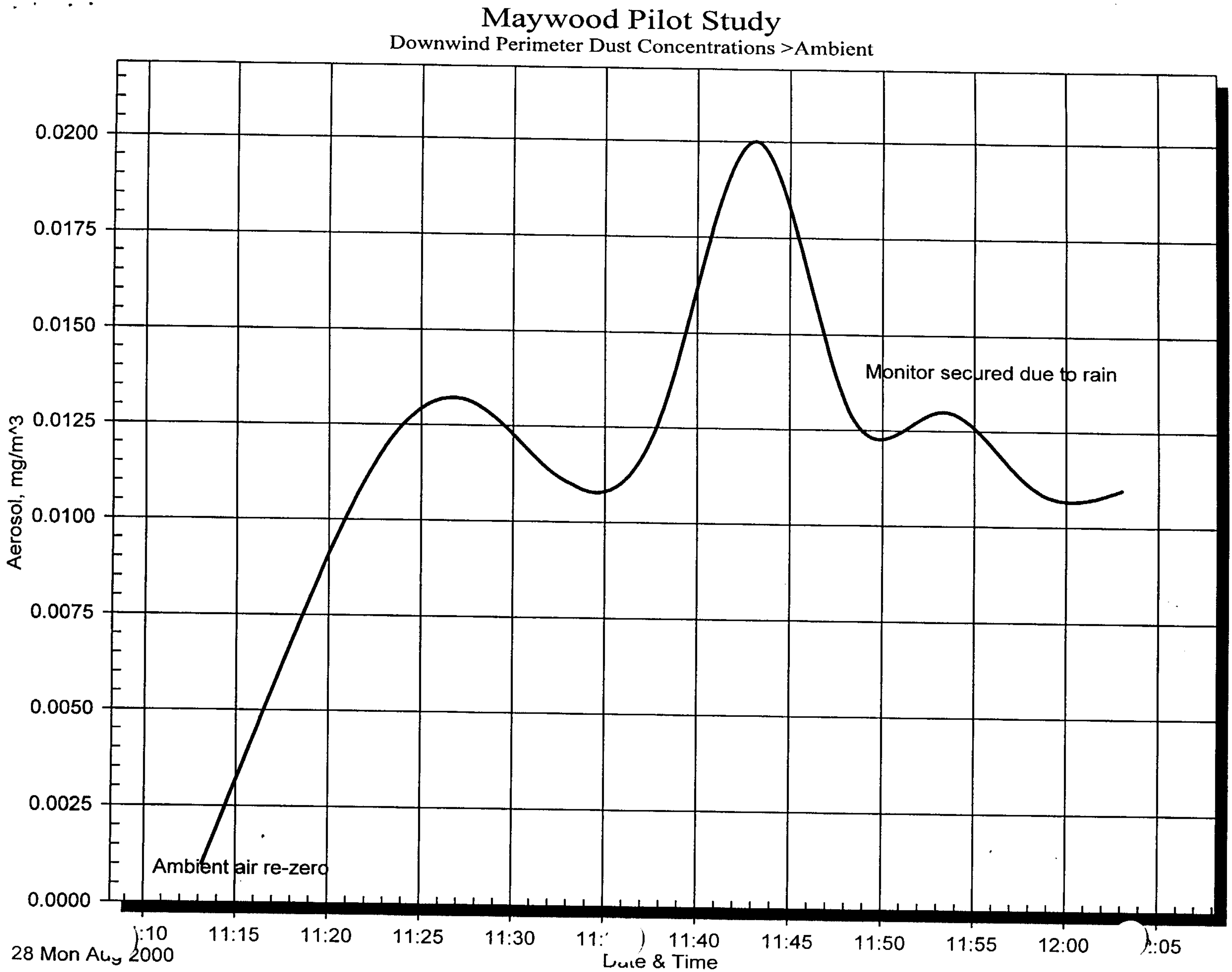
Current Graph:8-28-00PilotD/W1
Start time: 09:15:12 08/28/2000 Stop time: 11:00:12 08/28/2000

Legend:	Aerosol
Channel:	Aerosol
(Units)	mg/m^3
Average:	0.005
Lowest point:	-0.019
Time	11:00:12
Date	08/28/2000
Highest point:	0.050
Time	10:05:12
Date	08/28/2000
Log interval: hh:mm:ss	00:05:00


Maywood Pilot Study
Downwind Dust Concentrations >Ambient
0.05
0.04
0.03
0.02
0.01
-0.00
-0.01
-0.02
Aerosol, mg/m^3
9:30
10:00
10:30
Date & Time
Fall in levels due to fog decrease

Current Graph:8-28-00PilotD/W2
Start time: 11:08:11 08/28/2000 Stop time: 12:03:11 08/28/2000

Legend:	Aerosol
Channel:	Aerosol
(Units)	mg/m^3
Average:	0.011
Lowest point:	0.001
Time	11:13:11
Date	08/28/2000
Highest point:	0.020
Time	11:43:11
Date	08/28/2000
Log interval:	00:05:00
hh:mm:ss	



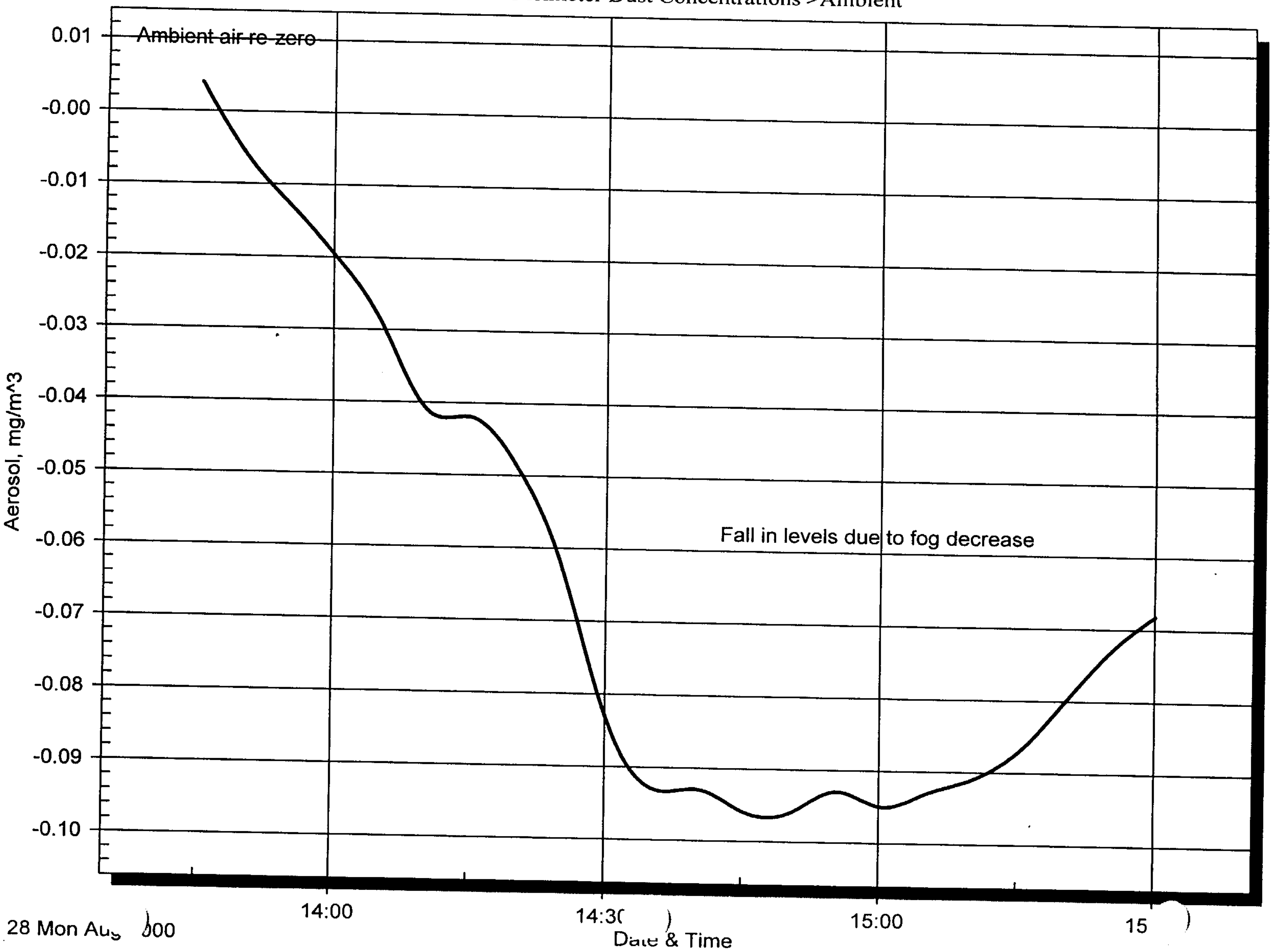
Maywood Pilot Study
Downwind Perimeter Dust Concentrations >Ambient
Aerosol, mg/m^3
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
Monitor secured due to rain
Ambient air re-zero
11:15
11:20
11:25
11:30
11:40
11:45
11:50
11:55
12:00
28 Mon Aug 2000
Date & Time

Current Graph:8-28-00PilotD/W3
Start time: 13:40:17 08/28/2000 Stop time: 15:30:17 08/28/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	-0.064
Lowest point: Time Date	-0.096 14:45:17 08/28/2000
Highest point: Time Date	0.004 13:45:17 08/28/2000
Log interval: hh:mm:ss	00:05:00

Maywood Pilot Study

Downwind Perimeter Dust Concentrations >Ambient

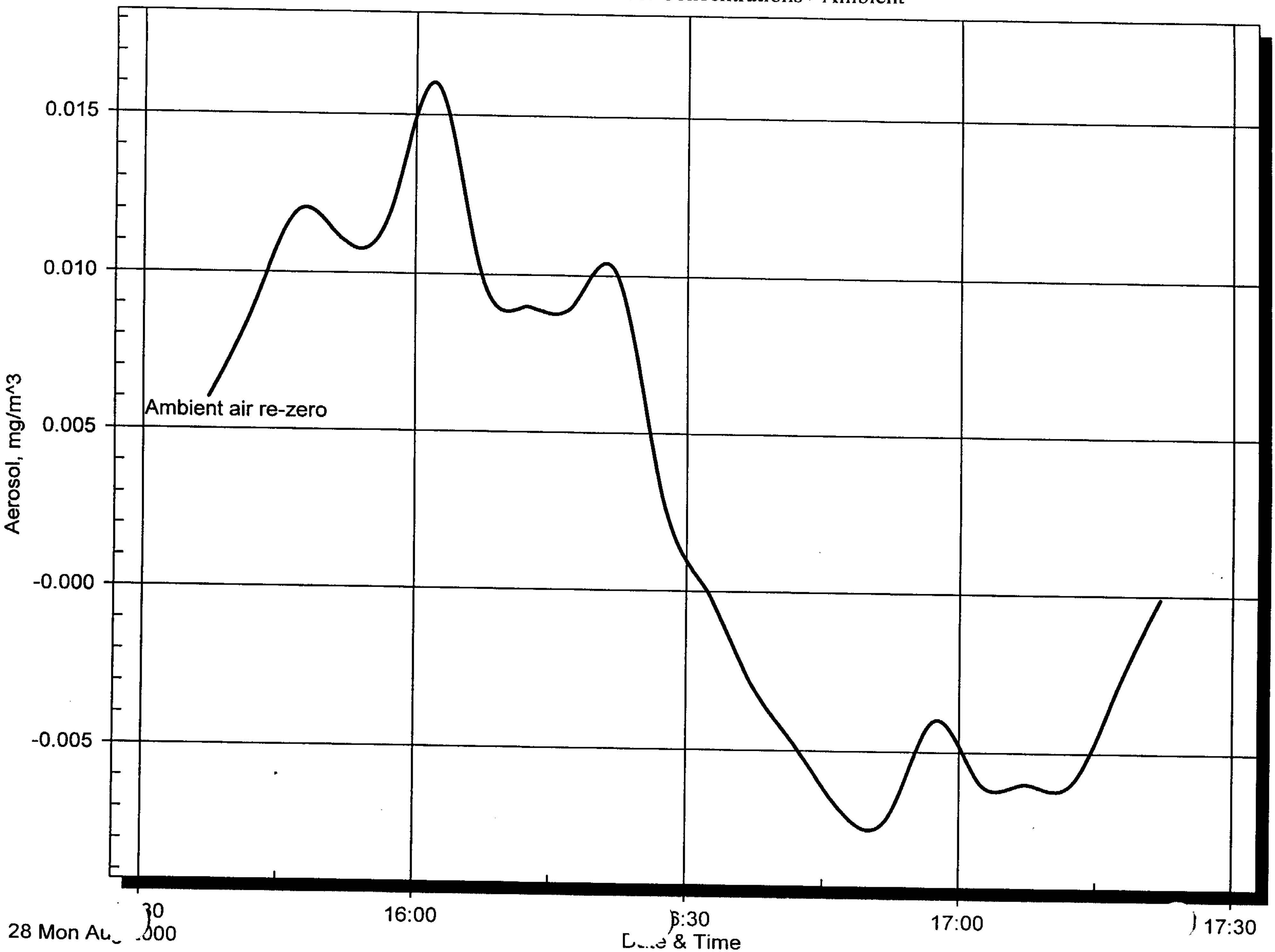


Current Graph:PilotD/W4
Start time: 15:32:18 08/28/2000 Stop time: 17:22:18 08/28/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	0.003
Lowest point: Time Date	-0.007 16:47:18 08/28/2000
Highest point: Time Date	0.016 16:02:18 08/28/2000
Log interval: hh:mm:ss	00:05:00

Maywood Pilot Study

Downwind Perimeter Dust Concentrations >Ambient



AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: PILOT

WEATHER CONDITIONS: OVERCAST/WIND FROM EAST

DATE: 8/29/00

PERSON PERFORMING MONITORING: R M Coblentz

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See HWP 14,15,16, & 17			Multi-Rae	21811
N/A			DustTrak	21760
			DUST TRAK	21762
			N/A	

INSTRUMENTS CALIBRATION: YES [X] NO [ ]

PPE IN USE: See HWP's

PROCESS: Processing STEPAN STOCKPILE

MONITORING DATA

LOCATION AND REMARKS	Dust (mg/m³)	TIME	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H2S (ppm)
Downwind perimeter WEST of RMA	.003	0900	N/A	N/A	N/A	N/A	N/A
STEPAN PILE & PROCESS AREAS	.10	1000	0.5	Ø	20.9	Ø	Ø
Process areas	.10	1345	Ø	Ø	21.1	Ø	Ø
Stepan stockpile	.01	1350	Ø	Ø	21.1	Ø	Ø
Downwind perimeter WEST of RMA	0.0	1410	N/A	N/A	N/A	N/A	N/A
N/A							

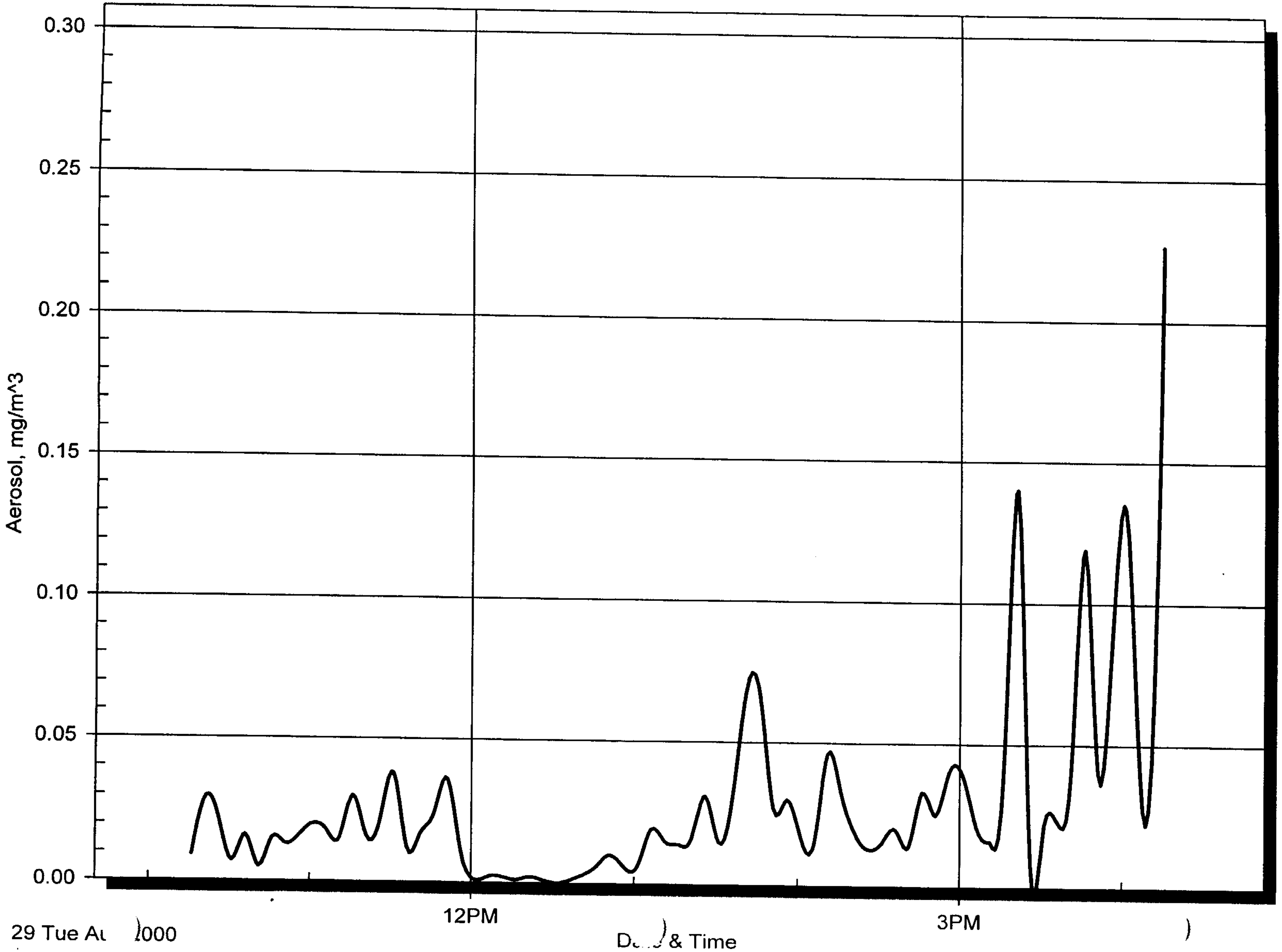
CONTINUED ON REVERSE SIDE

Current Graph:8-29-00PWA
Start time: 10:11:08 08/29/2000   Stop time: 16:16:08 08/29/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	0.029
Lowest point:	0.000
Time	12:31:08
Date	08/29/2000
Highest point:	0.280
Time	16:16:08
Date	08/29/2000
Log interval: hh:mm:ss	00:05:00

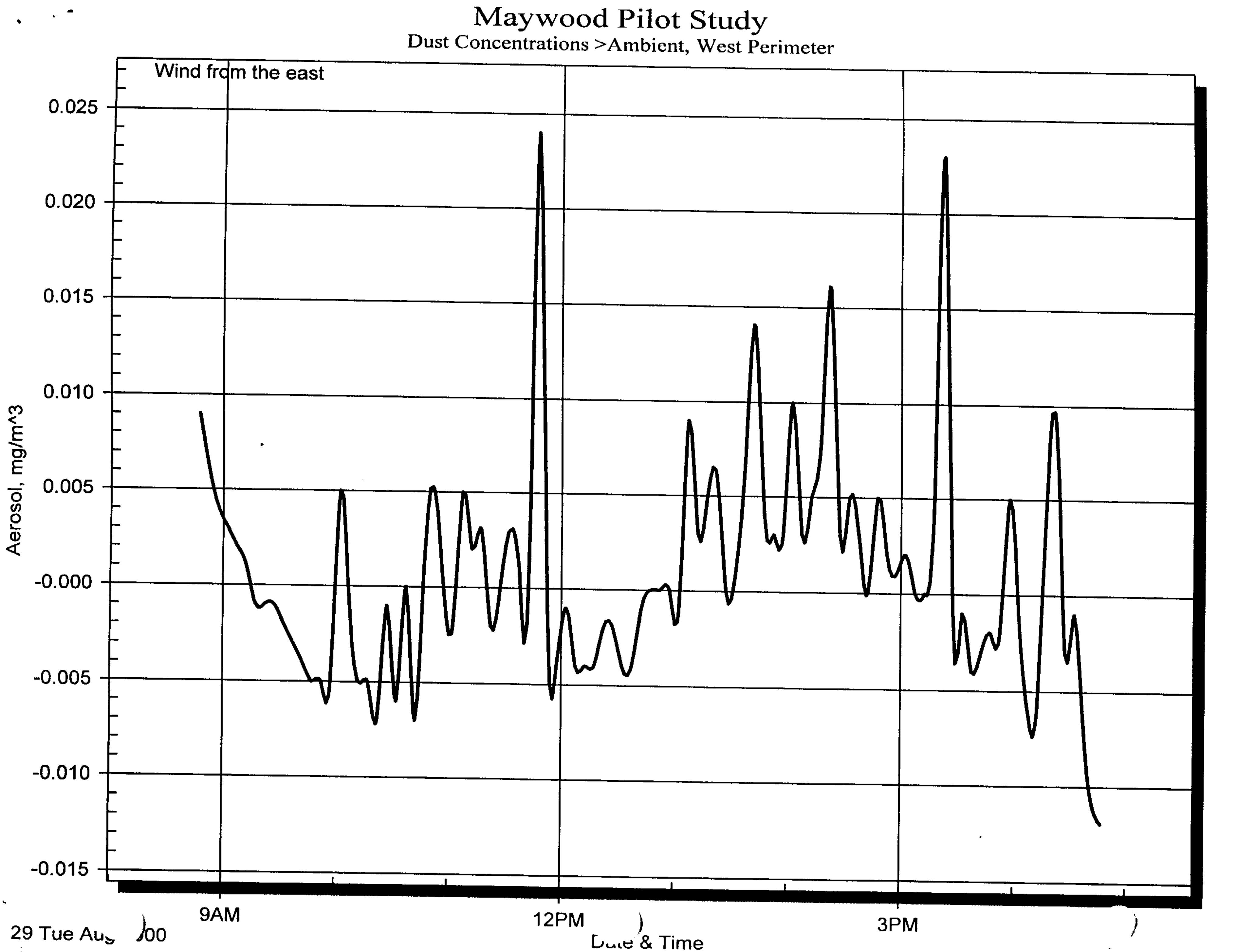
Maywood Pilot Study

Work Area Dust Concentrations >Ambient



Current Graph:8-29-00Pilot D/W
Start time: 08:42:27 08/29/2000 Stop time: 16:47:27 08/29/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	0.001
Lowest point: Time Date	-0.012 16:47:27 08/29/2000
Highest point: Time Date	0.024 11:47:27 08/29/2000
Log interval: hh:mm:ss	00:05:00


Maywood Pilot Study
Dust Concentrations >Ambient, West Perimeter
Wind from the east
0.025
0.020
0.015
0.010
0.005
-0.000
-0.005
-0.010
-0.015
Aerosol, mg/m^3
9AM
12PM
3PM
29 Tue Aug 2000
Date & Time

AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: Maywood Ballod	WEATHER CONDITIONS: CLOUDY WIND FROM NE / ~~EAST PM~~ 8/30/00 RMC	DATE: 8/30/00
PERSON PERFORMING MONITORING: RMCoblentz		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See HWP # 9			DUST TRAK	21763
NA			~~Multi-Rae~~ RMC 8/30/00	
			NA	

INSTRUMENTS CALIBRATION	PPE IN USE:	PROCESS:
YES [X] NO [ ]	See HWP #9	Soil excavation

MONITORING DATA

LOCATION AND REMARKS	TIME	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H2S (ppm)
Stationary Dust monitoring at South RMA perimeter – See attached charts						
NA						

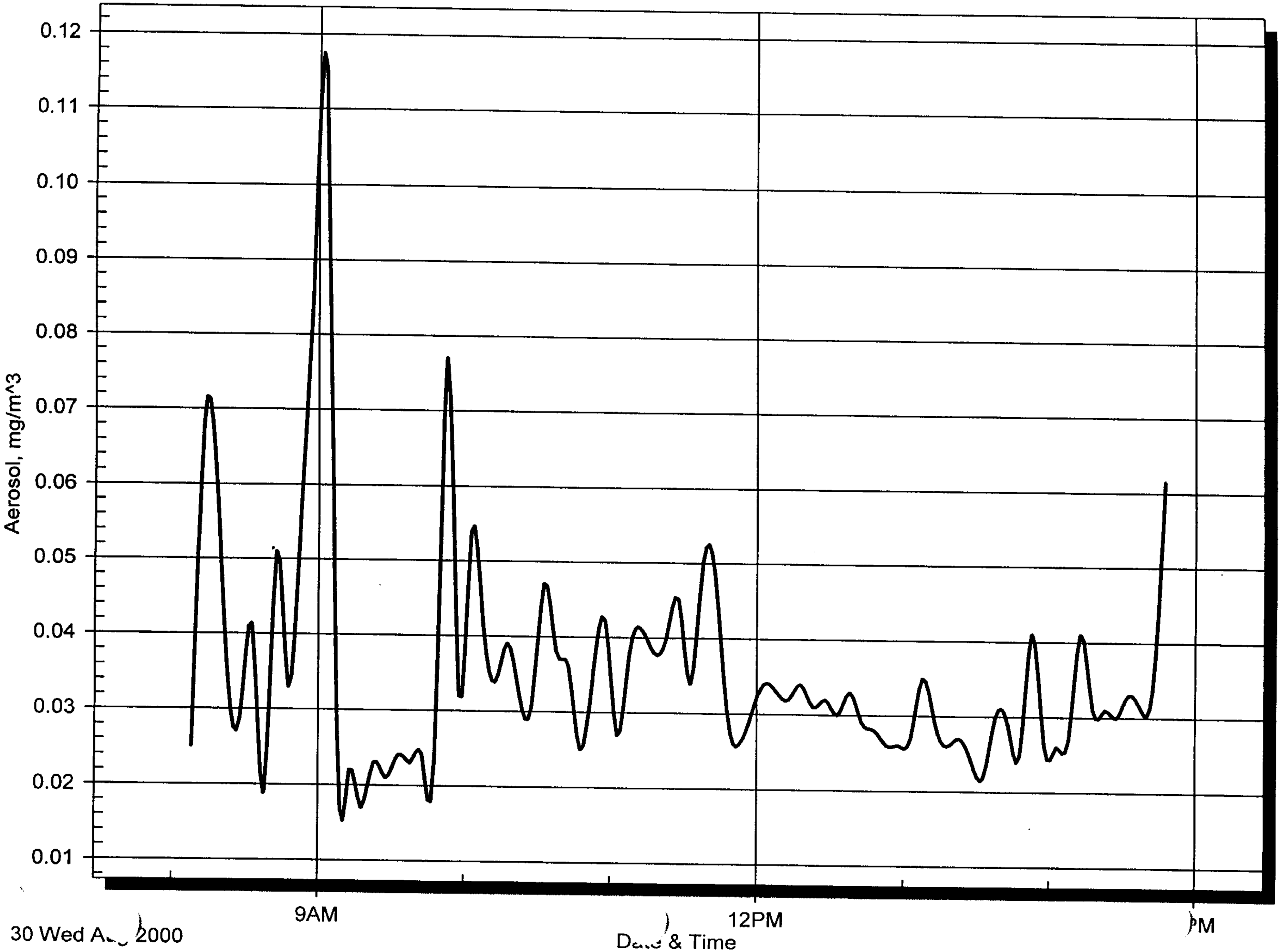
CONTINUED ON REVERSE SIDE

Current Graph:8-30-00Ballod
Start time: 08:02:56 08/30/2000 Stop time: 14:47:56 08/30/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	0.036
Lowest point:	0.017
Time	09:17:56
Date	08/30/2000
Highest point:	0.114
Time	09:02:56
Date	08/30/2000
Log interval: hh:mm:ss	00:05:00

Maywood Ballod Project

RMA Perimeter Downwind Dust Concentrations >Ambient



AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: SAA	WEATHER CONDITIONS: Cloudy Wind From South	DATE: 8/30/00
PERSON PERFORMING MONITORING: RMCoblentz		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See HWP #14, 15, 16, & 17			Dust TRAK	21760
N/A			~~Multi-Rae~~ N/A	~~21804~~ RMC 8/30/00

INSTRUMENTS CALIBRATION	PPE IN USE:	PROCESS:
YES (X) NO ( )	See HWP	Soil excavation & Sampling

MONITORING DATA

LOCATION AND REMARKS	TIME	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H_2S (ppm)
Stationary downwind perimeter dust monitoring North of SAA - See attached graphs.						
N/A						

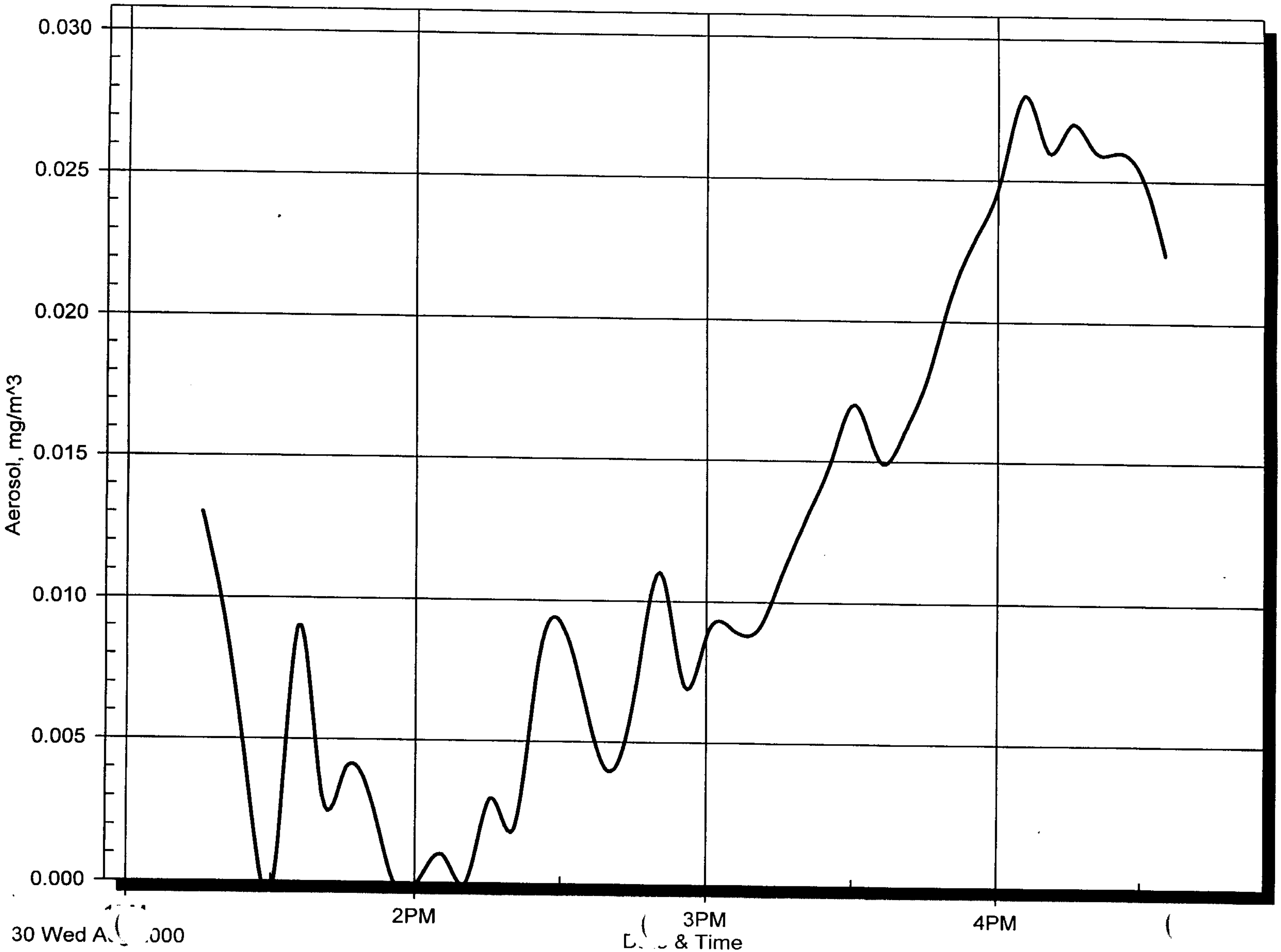
CONTINUED ON REVERSE SIDE

Current Graph:8-30-00SAA
Start time: 13:10:33 08/30/2000 Stop time: 16:35:33 08/30/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	0.012
Lowest point:	0.000
Time	13:30:33
Date	08/30/2000
Highest point:	0.028
Time	16:05:33
Date	08/30/2000
Log interval: hh:mm:ss	00:05:00

Maywood Pilot Study Soil Aquisition Area

Downwind Perimeter Dust Concentrations >Ambient



AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: Pilot	WEATHER CONDITIONS: Cloudy wind from NE / E (pm)	DATE: 8/30/00
PERSON PERFORMING MONITORING: RMCoblentz		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See HWP # 15, 16, 17, & 14			Dust Trak	21760
N/A			Dust Trak	21762
			Multi-Rae	21804
			N/A	

INSTRUMENTS CALIBRATION	PPE IN USE:	PROCESS:
YES [X] NO [ ]	See HWP's	Processing Stepan pile

MONITORING DATA

LOCATION AND REMARKS	Dust (mg/m^3)	TIME	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H_2S (ppm)
STEPAN PILE & Process areas	0.065	0930	Ø	Ø	20.9	Ø	Ø
Downwind Perimeter West of RMA	0.025	1030	N/A	N/A	N/A	N/A	N/A
STEPAN PILE & Process areas	0.09	1300	Ø	Ø	21.1	Ø	Ø
Downwind Perimeter West of RMA	0.03	1430	N/A	N/A	N/A	N/A	N/A
N/A							

CONTINUED ON REVERSE SIDE

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FORECAST AND CURRENT CONDITIONS

Maywood, NJ (07607)

CURRENTLY

as reported at Teterboro, NJ.
Last updated Wednesday, August 30, at 6:10 AM Eastern Daylight Time

Cloudy

Temp:	66°F
Wind:	From the Northeast at 6 mph
Dewpoint:	61°F
Rel. Humidity:	84%
Visibility:	10 miles
Barometer:	30.16 inches and rising
Sunrise:	6:21 am
Sunset:	7:30 pm

Detailed Local Forecast
Regional Audio Forecast
Regional Severe Weather Alerts

7-DAY FORECAST

last updated Wednesday, August 30, at 3:08 AM Eastern Daylight Time

TODAY	Isolated T-storms	hi 79°F	lo 68°F
THU	Hazy	hi 83°F	lo 70°F
FRI	Partly Cloudy	hi 86°F	lo 65°F
SAT	Mostly Cloudy	hi 81°F	lo 65°F
SUN	Mostly Cloudy	hi 83°F	lo 63°F
MON	Mostly Cloudy	hi 81°F	lo 61°F
TUE	Mostly Cloudy	hi 79°F	

Temp. converter: Enter a number and click outside the box
F: C: reset

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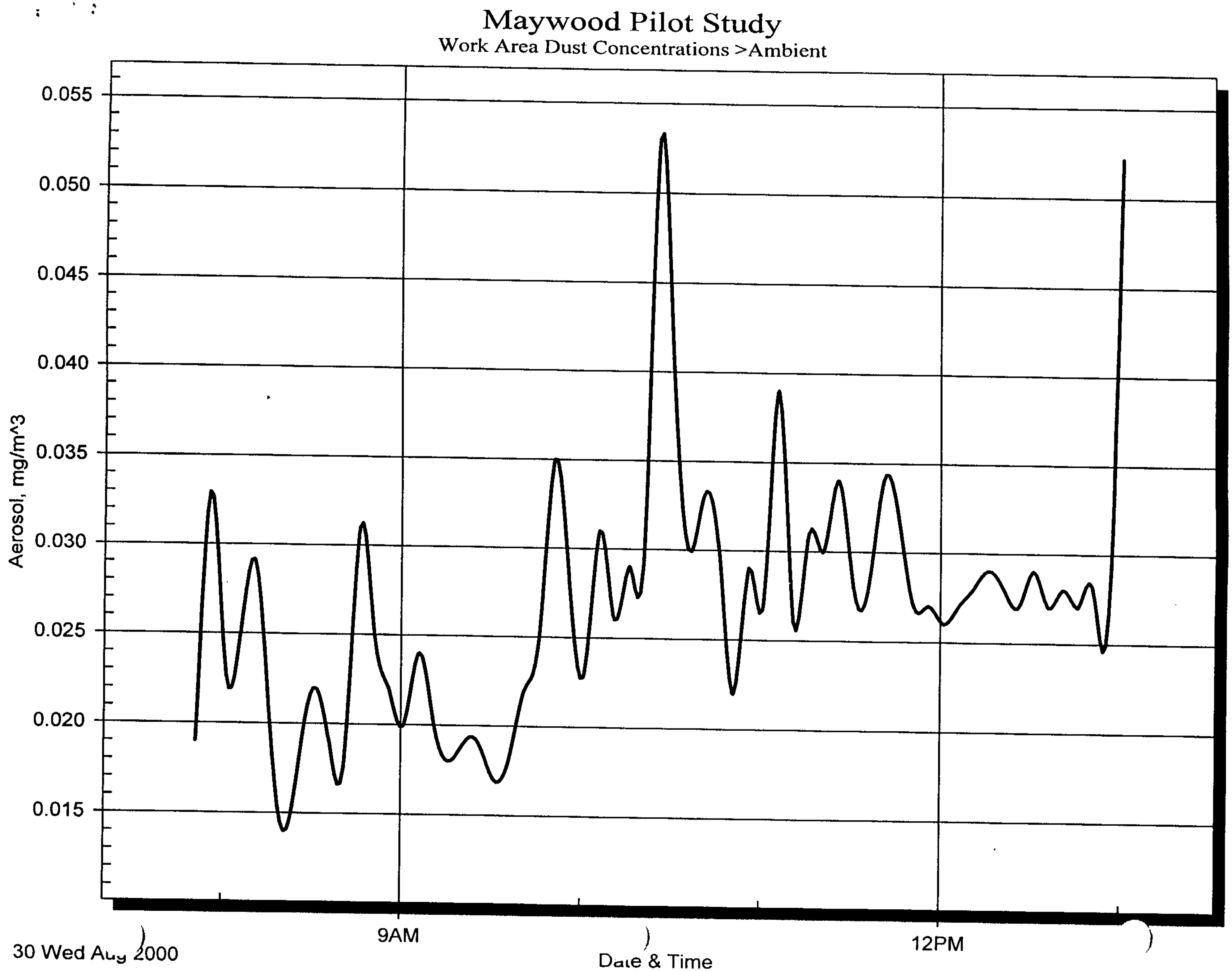
LOCAL LINKS

Local Doppler Radar | Regional Doppler Radar | Regional Satellite

7-day forecast
Detailed Local Forecast
Regional Audio Forecast
Regional Severe Weather Alerts

Current Graph:8-30-00PWA
Start time: 07:46:02 08/30/2000 Stop time: 13:01:02 08/30/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	0.027
Lowest point:	0.014
Time	08:21:02
Date	08/30/2000
Highest point:	0.053
Time	10:26:02
Date	08/30/2000
Log interval: hh:mm:ss	00:05:00



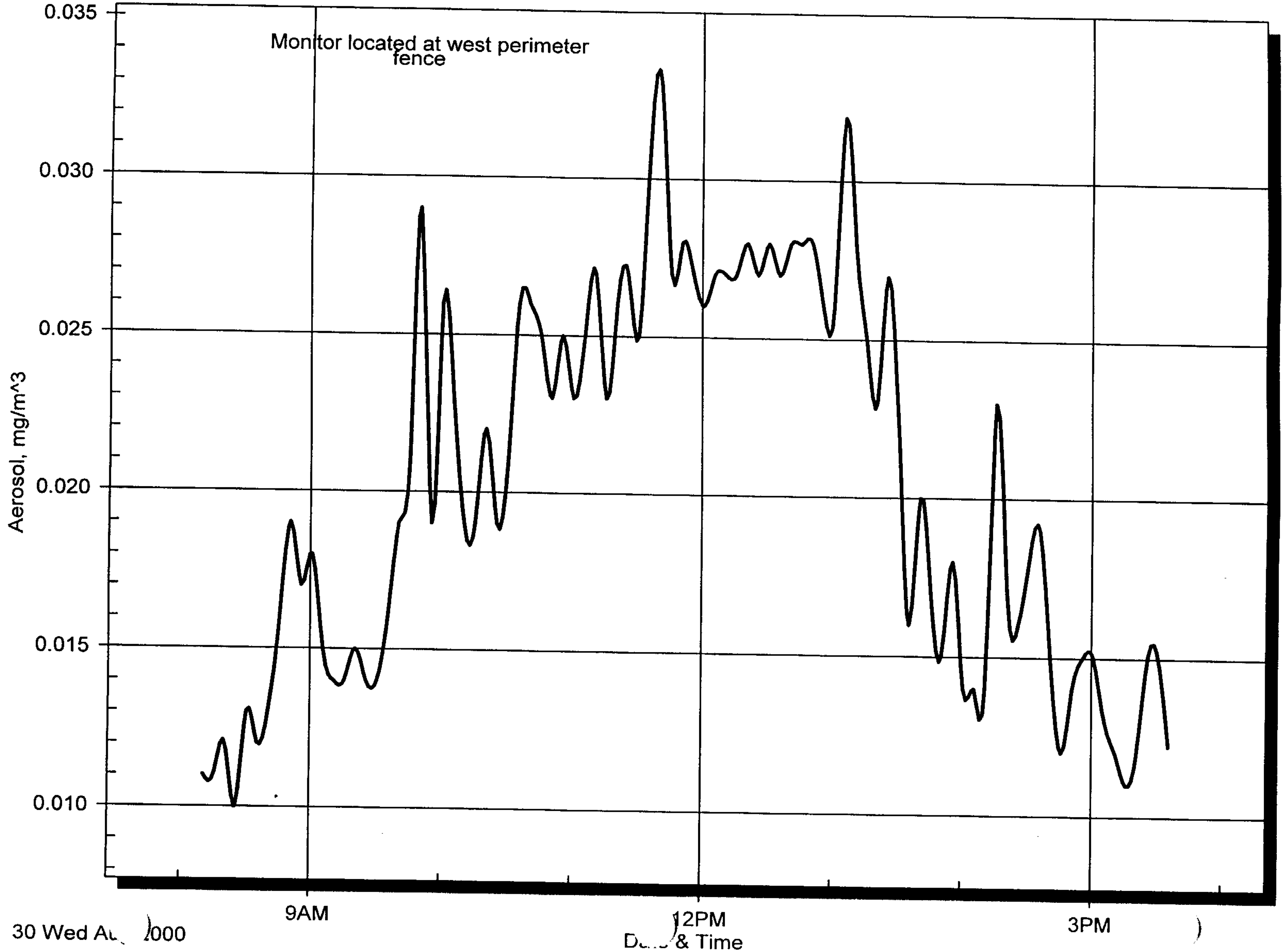
Maywood Pilot Study
Work Area Dust Concentrations >Ambient
Aerosol, mg/m^3
0.055
0.050
0.045
0.040
0.035
0.030
0.025
0.020
0.015
9AM
12PM
30 Wed Aug 2000
Date & Time

Current Graph:8-30-00Pilot D/W
Start time: 08:05:51 08/30/2000   Stop time: 15:35:51 08/30/2000

Legend:	Aerosol
Channel:	Aerosol
(Units)	mg/m^3
Average:	0.020
Lowest point:	0.010
Time	08:25:51
Date	08/30/2000
Highest point:	0.033
Time	11:40:51
Date	08/30/2000
Log interval:	00:05:00
hh:mm:ss	

Maywood Pilot Study

Downwind Perimeter Dust Concentrations >Ambient



AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: SAA	WEATHER CONDITIONS: Hazey/Light breeze from South (wind shift from north ~10:00)	DATE: 8/31/00
PERSON PERFORMING MONITORING: RMCoblentz		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See HWP			Dust Trak	
			Multi-Rae	

INSTRUMENTS CALIBRATION	PPE IN USE:	PROCESS:
YES [X] NO [ ]	See HWP	EXCAVATE & Load Soils

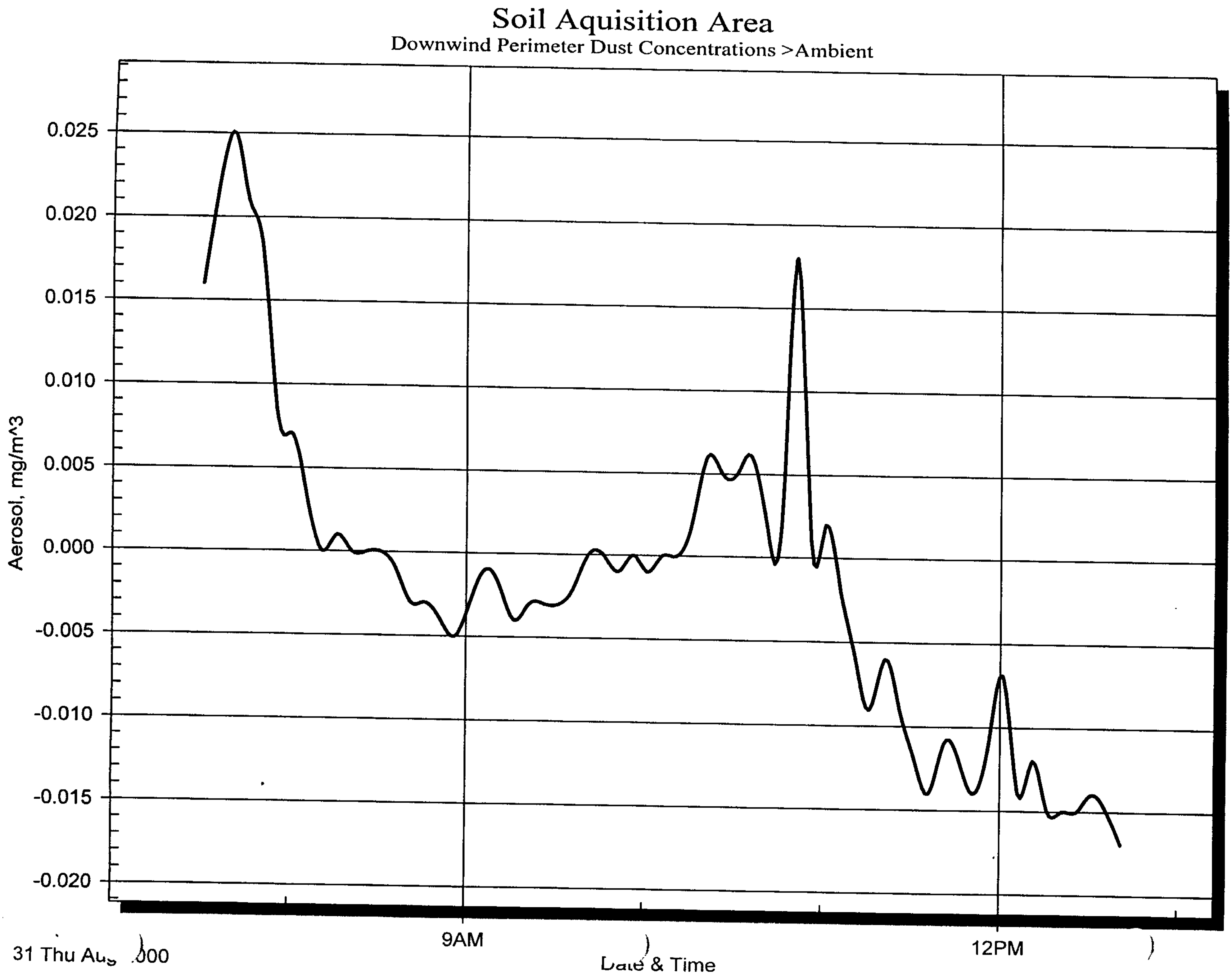
MONITORING DATA

LOCATION AND REMARKS	dust (mg/m3)	TIME	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H_2S (ppm)
RMA perimeter North side	.005	0730	N/A	N/A	N/A	N/A	N/A
RMA perimeter South side	.04	1030	N/A	N/A	N/A	N/A	N/A
Downwind perimeter fence	.003	1035	N/A	N/A	N/A	N/A	N/A
Relocate downwind monitor to NW side	.01 ~~.001~~	1400	N/A	N/A	N/A	N/A	N/A
SAA - EXCAVATION AREA	N/A	0840	0.0	0	21.0	0	0
SAA - SOIL STOCKPILE	N/A	1025	0.0	0	21.0	1	1
SAA - EXCAVATION AREA	N/A	1140	0.0	0	21.1	1	0
SAA - DEBRIS PILE	N/A	1142	0.0	0	21.0	0	0
SAA - EXCAVATION AREA	N/A	1400	0.0	1	21.2	1	0
SAA - EXCAVATON AREA	N/A	1615	0.0	1	21.2	0	0

CONTINUED ON REVERSE SIDE

Current Graph:8-31-00SAA1
Start time: 07:26:07 08/31/2000 Stop time: 12:41:07 08/31/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	-0.002
Lowest point: Time Date	-0.017 12:41:07 08/31/2000
Highest point: Time Date	0.025 07:41:07 08/31/2000
Log interval: hh:mm:ss	00:05:00

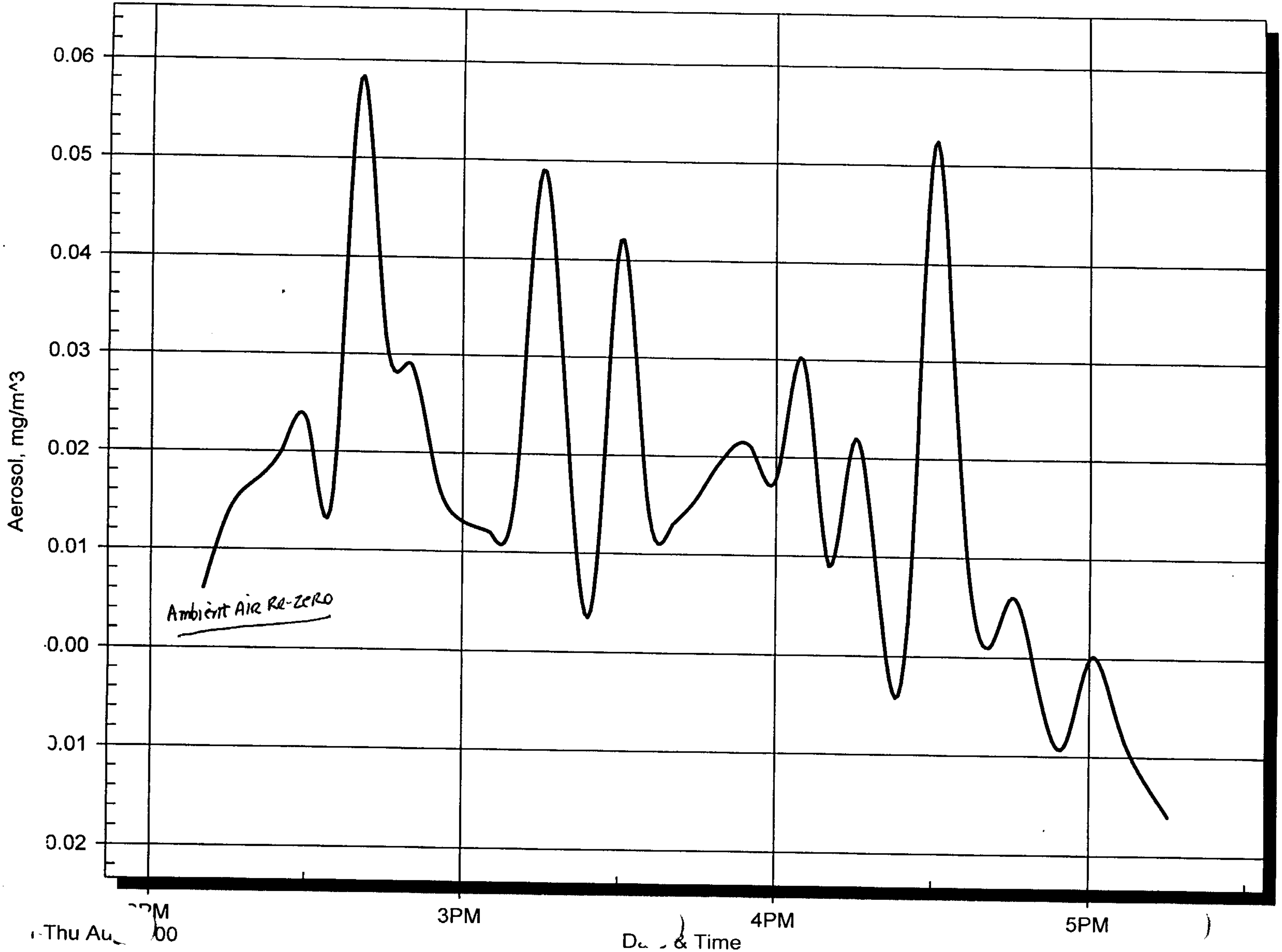

Soil Aquisition Area
Downwind Perimeter Dust Concentrations >Ambient
0.025
0.020
0.015
0.010
0.005
0.000
-0.005
-0.010
-0.015
-0.020
Aerosol, mg/m^3
9AM
12PM
Date & Time

Current Graph:8-31-00SAA2
Start time: 14:05:10 08/31/2000 Stop time: 17:15:10 08/31/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	0.016
Lowest point: Time Date	-0.016 17:15:10 08/31/2000
Highest point: Time Date	0.058 14:40:10 08/31/2000
Log interval: hh:mm:ss	00:05:00

Soil Aquisition Area

Downwind Perimeter Dust Concentrations >Ambient



AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: SAA	WEATHER CONDITIONS: Cloudy - Wind from The South	DATE: 9-1-00
PERSON PERFORMING MONITORING: R Coblentz		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See HWP 14, 15, 16, & 17			Dust Trak	21760
N/A			N/A	

INSTRUMENTS CALIBRATION	PPE IN USE:	PROCESS:
YES [X] NO [ ]	See HWP	Soil excavation

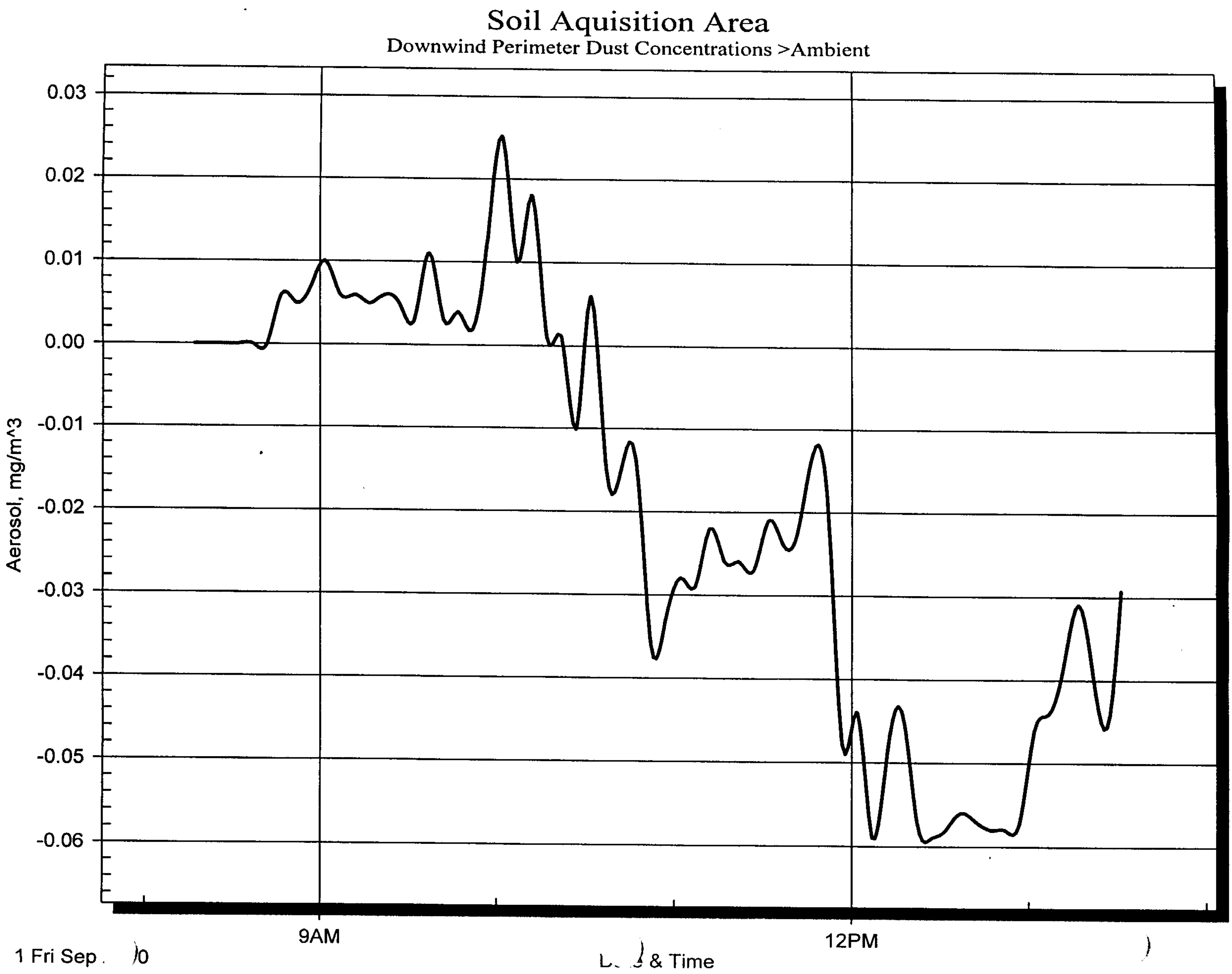
MONITORING DATA

LOCATION AND REMARKS	Dust (mg/m³)	TIME	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H2S (ppm)
North perimeter	.003	0830	N/A	N/A	N/A	N/A	N/A
N/A							

CONTINUED ON REVERSE SIDE

Current Graph:9-1-00SAA
Start time: 08:11:55 09/01/2000   Stop time: 13:31:55 09/01/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	-0.019
Lowest point:	-0.059
Time	12:06:55
Date	09/01/2000
Highest point:	0.025
Time	10:01:55
Date	09/01/2000
Log interval: hh:mm:ss	00:05:00



Soil Aquisition Area
Downwind Perimeter Dust Concentrations >Ambient
0.03
0.02
0.01
0.00
-0.01
-0.02
-0.03
-0.04
-0.05
-0.06
Aerosol, mg/m^3
9AM
12PM
1 Fri Sep
& Time

AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: BALLOD	WEATHER CONDITIONS: Clear - Wind From the North	DATE: 9-5-00
PERSON PERFORMING MONITORING: RMCoblentz		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See HWP # 9			Multi Rae	21763
N/A			Dust Trak	
			N/A	

INSTRUMENTS CALIBRATION	PPE IN USE:	PROCESS:
YES [X] NO [ ]	See HWP	Loading Trucks with Soils

MONITORING DATA

LOCATION AND REMARKS	Dust (mg/m³)	TIME	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H2S (ppm)
East RMA perimeter	0.012	0915	N/A	N/A	N/A	N/A	N/A
North RMA perimeter	0.007	↓	↓	↓	↓	↓	↓
South RMA perimeter	0.019	↓	↓	↓	↓	↓	↓
@ Soil Stockpile	N/A	1030	Ø	Ø	21.0	Ø	Ø
South RMA perimeter	0.006	1330	N/A	N/A	N/A	N/A	N/A
around soil stockpile	N/A	1340	Ø	Ø	22.0	Ø	Ø
N/A							

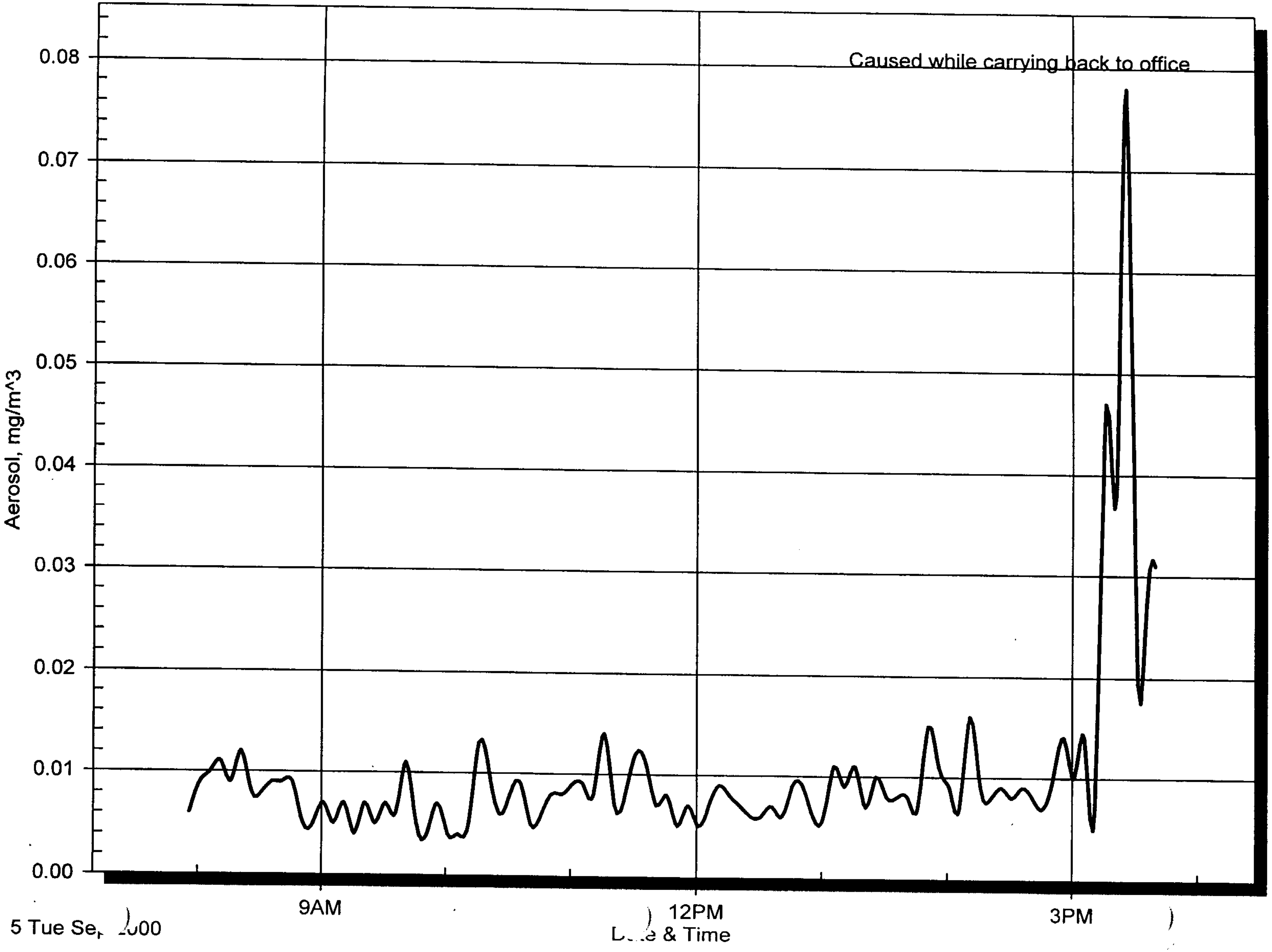
CONTINUED ON REVERSE SIDE

Current Graph:9-5-00Ballod
Start time: 07:50:52 09/05/2000 Stop time: 15:40:52 09/05/2000

Legend:	Aerosol
Channel:	Aerosol
(Units)	mg/m^3
Average:	0.010
Lowest point:	0.004
Time	09:15:52
Date	09/05/2000
Highest point:	0.078
Time	15:25:52
Date	09/05/2000
Log interval: hh:mm:ss	00:05:00

Maywood Ballod Project

RMA Perimeter Downwind Dust Concentrations



AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: Pilot	WEATHER CONDITIONS: Clear - Wind from the north	DATE: 9-5-00
PERSON PERFORMING MONITORING: RMCoblentz		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See HWP 14, 15, 16, & 17			Dust Trak	21762
N/A			N/A	

INSTRUMENTS CALIBRATION	PPE IN USE:	PROCESS:
YES [X] NO [ ]	See HWP	Processing Soils

MONITORING DATA

LOCATION AND REMARKS	Dust (mg/m³)	TIME	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H_2S (ppm)
Stationary downwind perimeter (south) see attached graph							
South perimeter (direct reading)	0.012	0830	N/A	N/A	N/A	N/A	N/A
South perimeter (direct reading)	0.002	1000	N/A	N/A	N/A	N/A	N/A
South perimeter (direct reading)	0.007	1400	N/A	N/A	N/A	N/A	N/A
N/A							

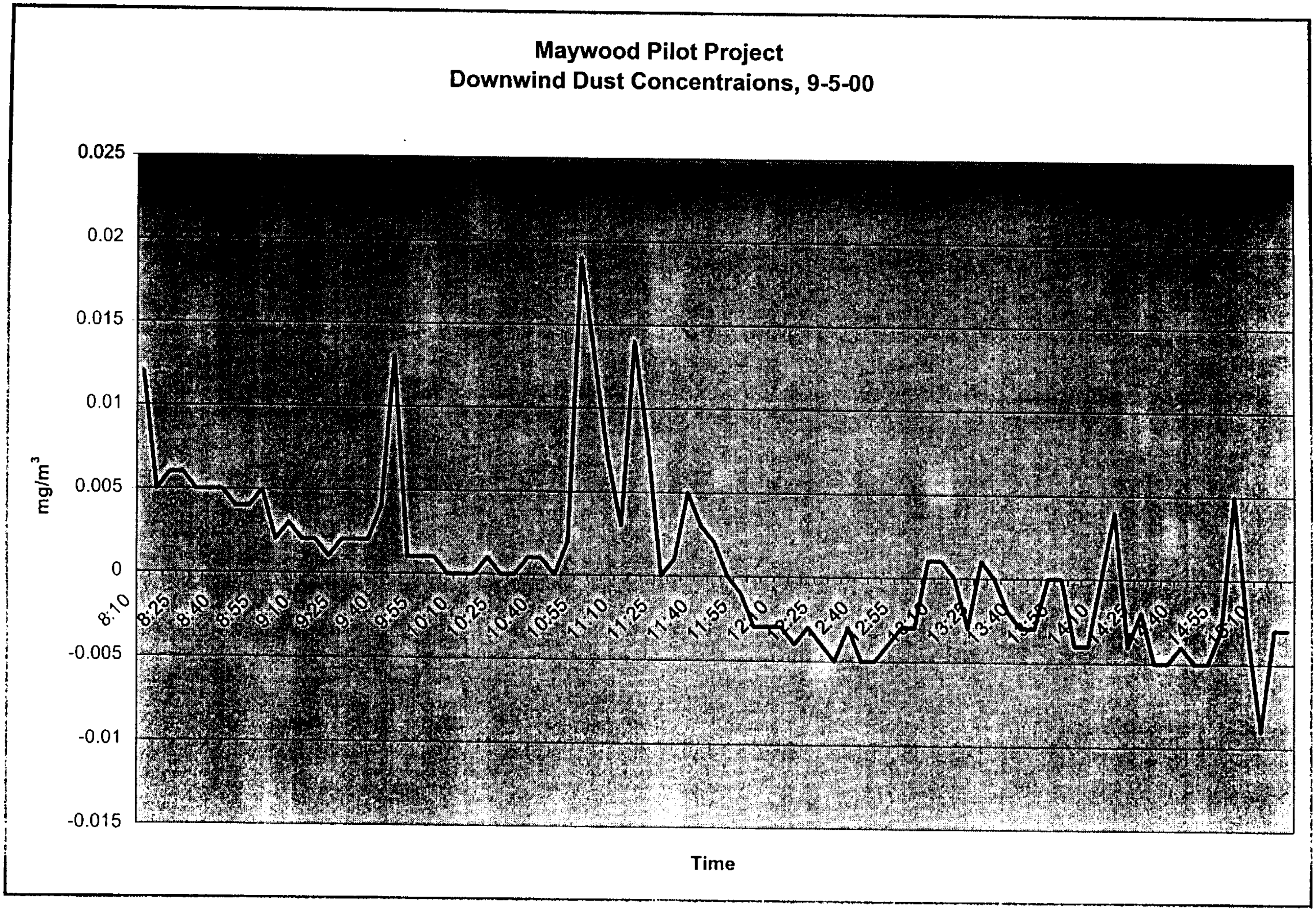
CONTINUED ON REVERSE SIDE

Maywood Pilot Project Dust Monitoring Summary 9/5/00

Model:	Dust Trak
Serial Number:	22007
Test ID:	1
Test Abbreviation:	
Start Date:	9/5/00
Start Time:	8:05:17
Duration (dd:hh:mm:ss):	-11500:-19:-48:-8
Time constant (seconds):	10
Log Interval (mm:ss):	5:00
Number of points:	88

Notes: Loss of battery power

Statistics:		
	Channel:	Aerosol
	Units:	mg/m^3
	Average:	0.002
	Minimum:	-6456.266
	Time of Minimum:	15:25:17
	Date of Minimum:	9/5/00
	Maximum:	0.019
	Time of Maximum:	10:55:17
	Date of Maximum:	9/5/00



Last data point, -6456.266, caused by battery power loss. Omitted from chart.

AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: Soil Aquisition Area	WEATHER CONDITIONS: Clear - wind from the north	DATE: 9-5-00
PERSON PERFORMING MONITORING: RM Coblentz		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See HWP 14, 15, 16, & 17			~~Multi-Rae~~ 9-5-00 RMC	N/A
N/A			Dust Trak	21160
			N/A	

INSTRUMENTS CALIBRATION	PPE IN USE:	PROCESS:
YES [X] NO [ ]	See HWP	Soil excavation & Loading

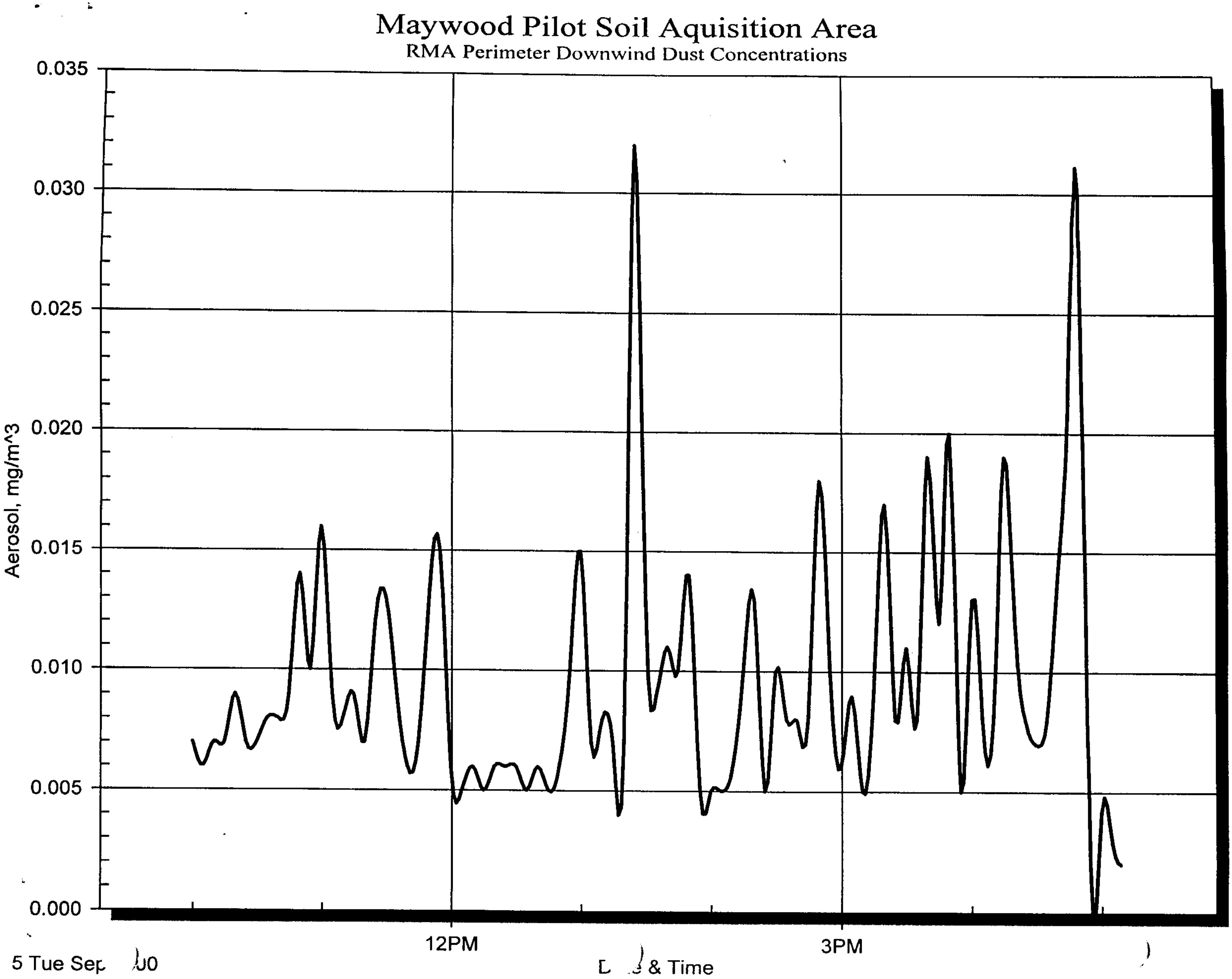
MONITORING DATA

LOCATION AND REMARKS	TIME	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H2S (ppm)
Stationary Downwind dust monitoring South RMA perimeter - See attachment						
N/A						

CONTINUED ON REVERSE SIDE

Current Graph:9-5-00SoilAq
Start time: 09:54:30 09/05/2000 **Stop time: 17:09:30 09/05/2000**

Legend:	**Aerosol**
Channel:	**Aerosol**
(Units)	**mg/m^3**
Average:	**0.010**
Lowest point:	**0.002**
Time	**16:54:30**
Date	**09/05/2000**
Highest point:	**0.032**
Time	**13:24:30**
Date	**09/05/2000**
Log interval:	**00:05:00**
hh:mm:ss	



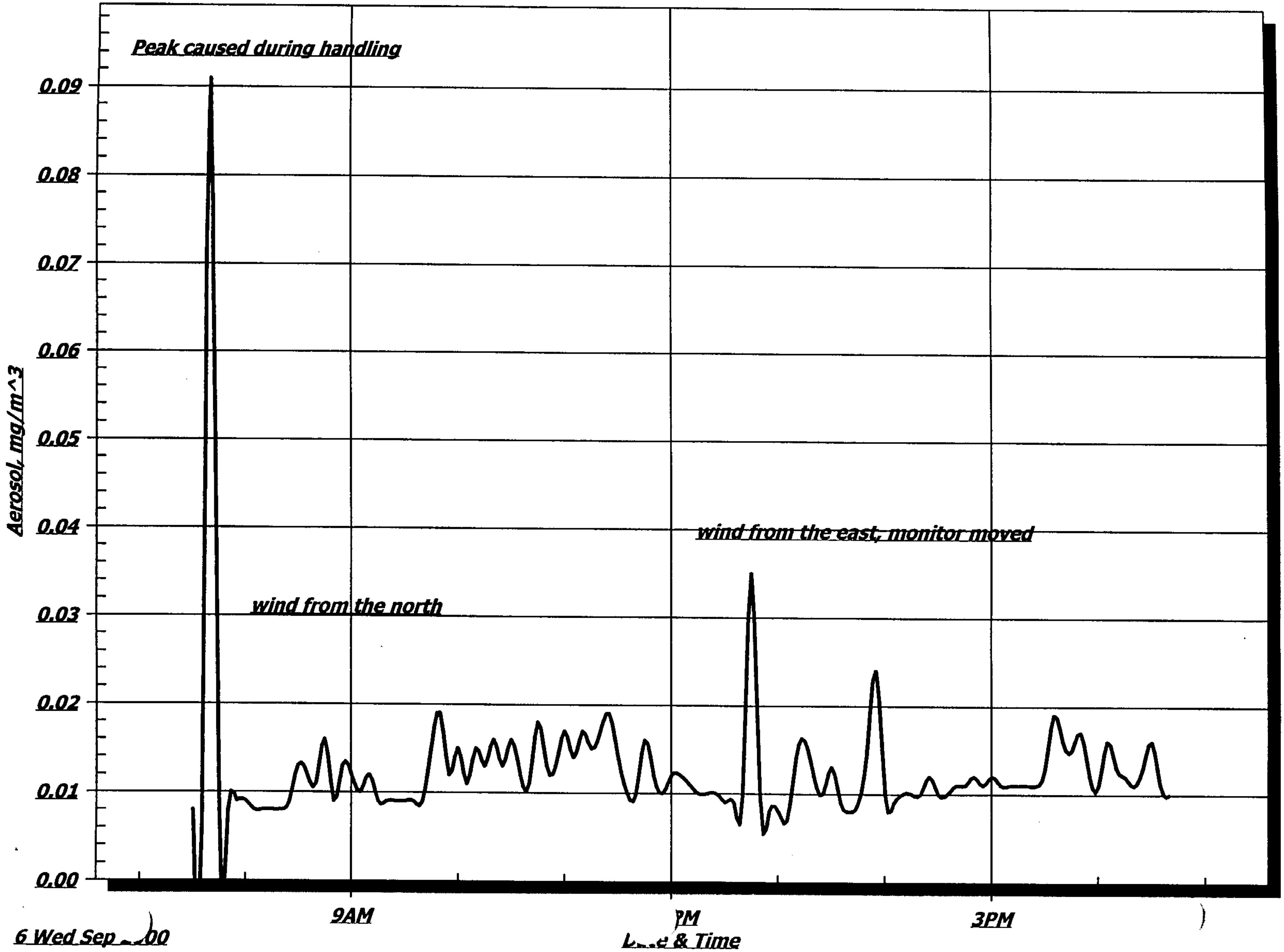
Maywood Pilot Soil Aquisition Area
RMA Perimeter Downwind Dust Concentrations
Aerosol, mg/m^3
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
12PM
3PM
5 Tue Sep
& Time

Current Graph:9-6-00SoilAq
Start time: 07:25:10 09/06/2000 Stop time: 16:40:10 09/06/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	0.013
Lowest point:	0.007
Time	07:35:10
Date	09/06/2000
Highest point:	0.091
Time	07:40:10
Date	09/06/2000
Log interval: hh:mm:ss	00:05:00

Maywood Pilot Soils Aquisition Area

RMA Perimeter Downwind Dust Concentrations



AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: PILOT	WEATHER CONDITIONS: Clear - Light wind from North EAST (PM)	DATE: 9-6-00
PERSON PERFORMING MONITORING: RMCoblentz		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See HWP 14, 15, 16, & 17			Dust TRAK	21762
N/A			N/A	

INSTRUMENTS CALIBRATION	PPE IN USE:	PROCESS:
YES [X] NO [ ]	See HWP	Processing SAA soils

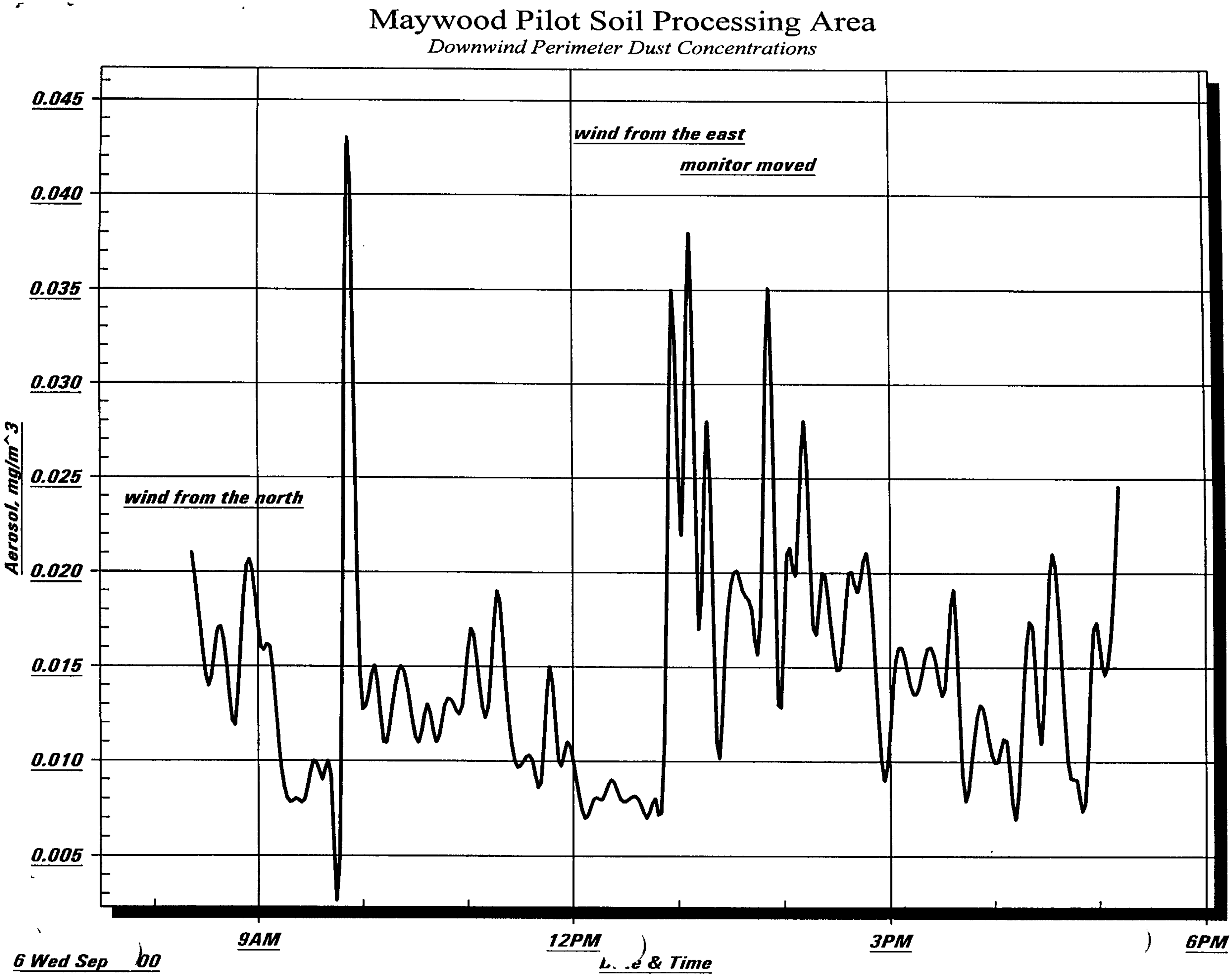
MONITORING DATA

LOCATION AND REMARKS	Dust (mg/m3)	TIME	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H2S (ppm)
Downwind perimeter south of RMA	.009	0800	N/A	N/A	N/A	N/A	N/A
Downwind perimeter south of RMA	.012	1000	N/A	N/A	N/A	N/A	N/A
Downwind perimeter west of RMA	.015	1238	N/A	N/A	N/A	N/A	N/A
Downwind perimeter west of RMA	.009	1700	N/A	N/A	N/A	N/A	N/A
N/A							

CONTINUED ON REVERSE SIDE

Current Graph:9-6-00Pilot
Start time: 08:16:46 09/06/2000   Stop time: 17:11:46 09/06/2000

Legend:	Aerosol
Channel:	Aerosol
(Units)	mg/m^3
Average:	0.015
Lowest point:	0.006
Time	09:46:46
Date	09/06/2000
Highest point:	0.043
Time	09:51:46
Date	09/06/2000
Log interval:	00:05:00
hh:mm:ss	



Maywood Pilot Soil Processing Area
Downwind Perimeter Dust Concentrations
0.045
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
Aerosol, mg/m^3
wind from the north
wind from the east
monitor moved
9AM
12PM
3PM
6PM
6 Wed Sep 00
& Time

AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: PILOT	WEATHER CONDITIONS: Clear, Light Wind from the north (EAST after 1030)	DATE: 9-7-00
PERSON PERFORMING MONITORING: RMCoblentz		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See HWP 14, 15, 16, 17			Dust Trak	2
NA			Multi-Rae	21809
			NA	

INSTRUMENTS CALIBRATION	PPE IN USE:	PROCESS:
YES (X) NO [ ]	See HWP	Processing Stockpile Soils

MONITORING DATA

LOCATION AND REMARKS	Dust (mg/m³)	TIME	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H_2S (ppm)
Soils Stockpile	0.1	~~0745~~ ~~0845~~ RMC 9-7-00	N/A	N/A	N/A	N/A	N/A
Whitney aggregate separator	0.08	↓	NA				
Thermo aggregate separator	0.05						
Soil Discharge	0.04						
Upwind background	0.03						
Downwind RMA perimeter (south side)	0.03	0845	N/A	N/A	N/A	N/A	N/A
Downwind perimeter (west ~~east~~ side) RMC 9-7-00	0.03	1030	Ø	2	21.0	Ø	Ø
Upwind background	0.017	1025	Ø	2	21.0	Ø	Ø
Downwind perimeter (west)	.043	1325	Ø	1	21.0	Ø	Ø
Upwind background	.04	1330	Ø	1	21.0	Ø	Ø

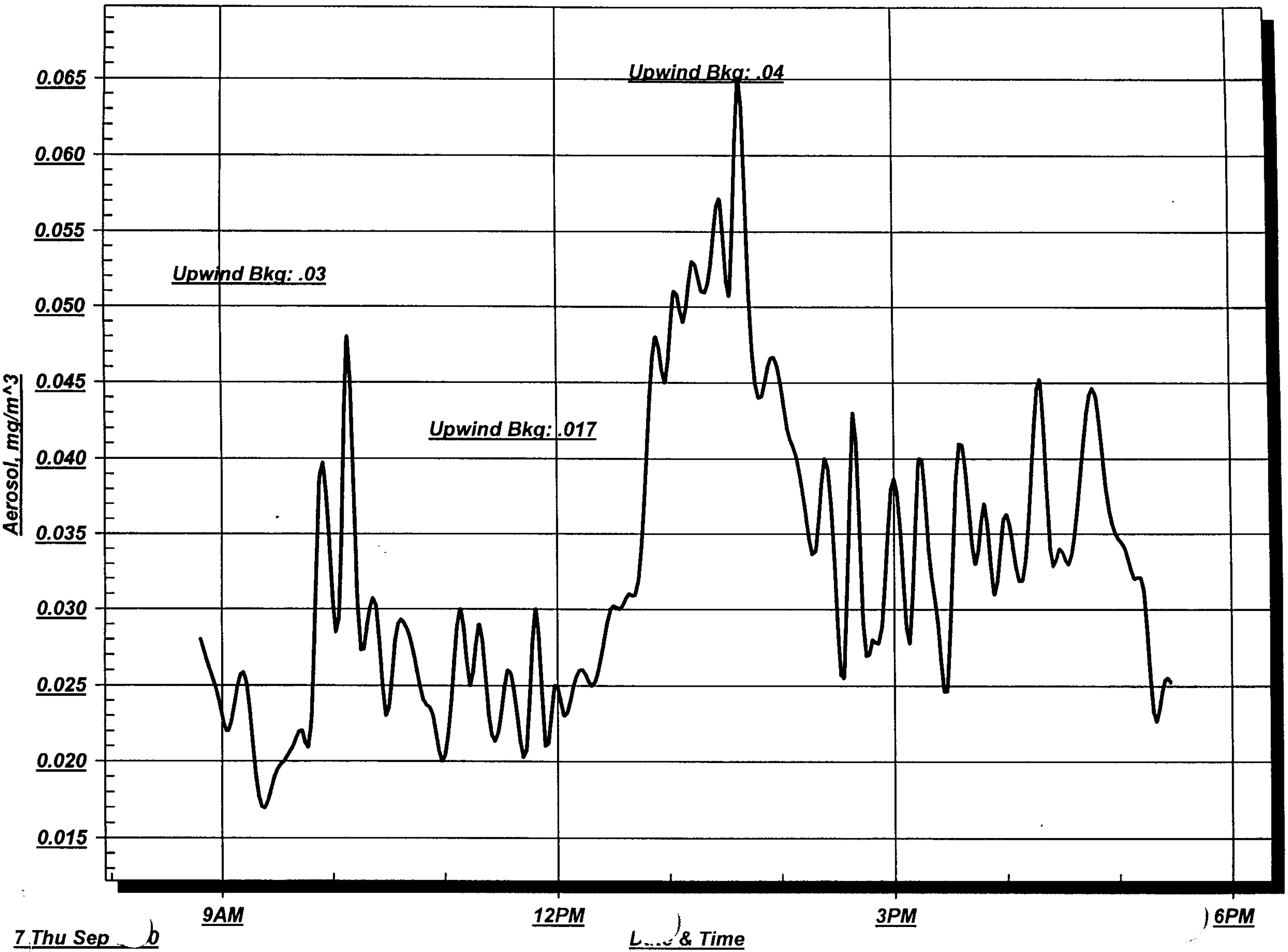
CONTINUED ON REVERSE SIDE

Current Graph:9-7-00PilotDust
Start time: 08:43:28 09/07/2000 Stop time: 17:28:28 09/07/2000

Legend:	Aerosol
Channel:	Aerosol
(Units)	mg/m^3
Average:	0.033
Lowest point:	0.017
Time	09:23:28
Date	09/07/2000
Highest point:	0.065
Time	13:38:28
Date	09/07/2000
Log interval:	00:05:00
hh:mm:ss	

Maywood Pilot Processing Area

Downwind Perimeter Dust Concentrations



AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: Soils Aquisition Area	WEATHER CONDITIONS: Clear, wind from the east	DATE: 9-7-00
PERSON PERFORMING MONITORING: RM Coblentz		

EMPLOYEES PRESENT:	HRS PRESENT	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See HWP 14, 15, 16, & 17			Dust TRAK	21760
	NA			NA

INSTRUMENTS CALIBRATION	PPE IN USE:	PROCESS:
YES [X] NO [ ]	See HWP	mapping, walkovers, slug excavation & loading

MONITORING DATA

LOCATION AND REMARKS	Dust (mg/m³)	TIME	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H2S (ppm)
Downwind RMA perimeter (west)	0.02	1130	N				
Downwind RMA perimeter (west)	0.04	1250					
Upwind background	0.04	1250					

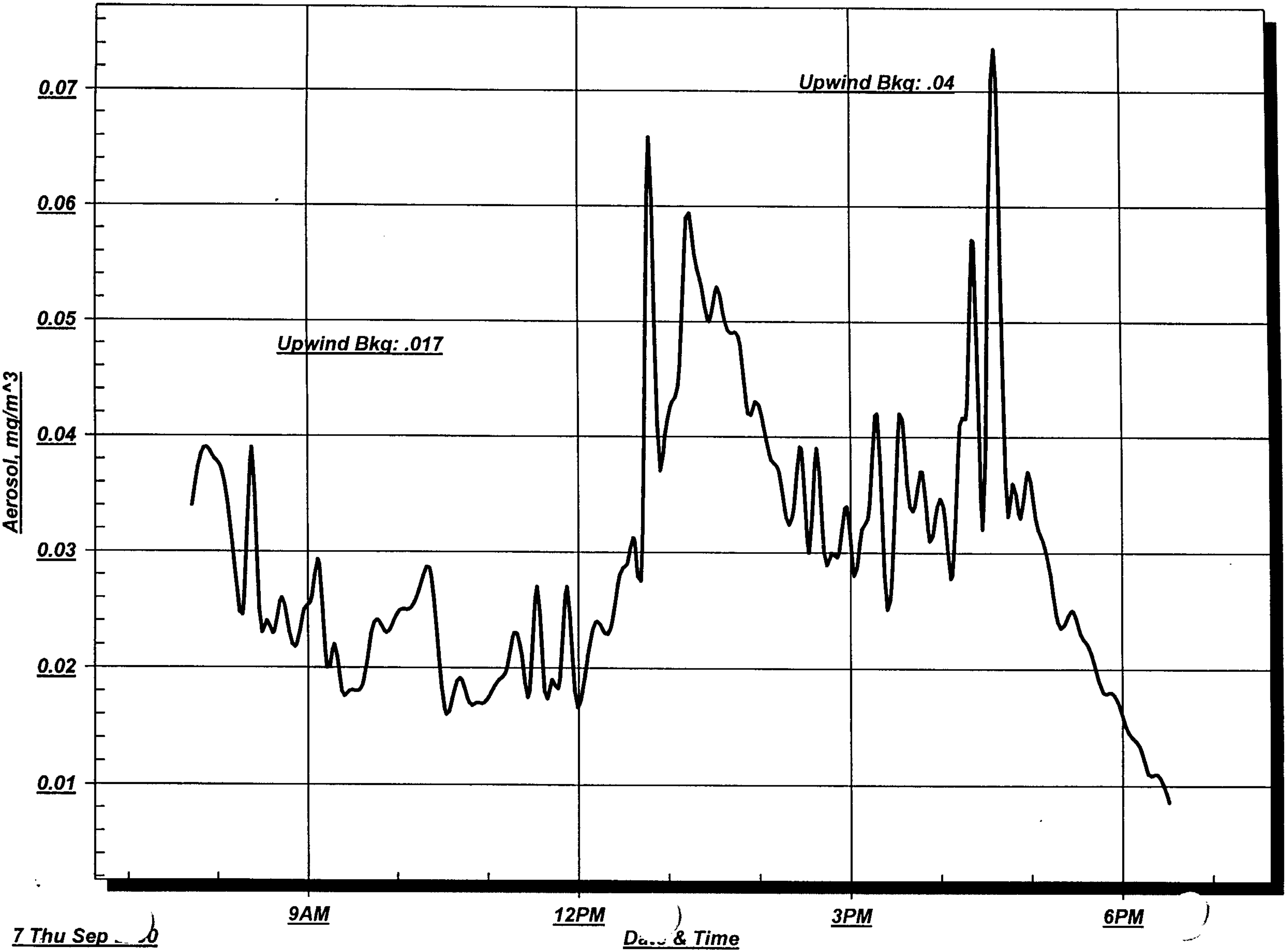
CONTINUED ON REVERSE SIDE

Current Graph:9-7-00SoilAqDust
Start time: 07:37:26 09/07/2000 Stop time: 18:32:26 09/07/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	0.030
Lowest point:	0.008
Time	18:32:26
Date	09/07/2000
Highest point:	0.071
Time	16:37:26
Date	09/07/2000
Log interval: hh:mm:ss	00:05:00

Pilot Soils Aquisition Area

Downwind Perimeter Dust Concentrations



AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: BALLOD	WEATHER CONDITIONS: Clear, Light Breeze From the north *	DATE: 9-7-00
PERSON PERFORMING MONITORING: RMCoblentz		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See HWP #9			Dust Trak	21763
N/A			Multi - Rae	21809
			N/A	

INSTRUMENTS CALIBRATION	PPE IN USE:	PROCESS:
YES [✓] NO [ ]	See HWP #9	Loading Soils

MONITORING DATA

LOCATION AND REMARKS	DUST (mg/m³)	TIME	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H_2S (ppm)
Soil Load work area	0.5	0850	Ø	Ø	20.8	Ø	Ø
RMA Boundary Downwind (south)	0.025	0850	Ø	Ø	20.8	Ø	Ø
RMA Boundary Downwind	0.018	1045	Ø	4	21.1	Ø	Ø
Upwind background	0.017	1045	Ø	~~4~~ 4 RMC 9-7-00	21.1	Ø	Ø
RMA Boundary Downwind (south)	0.06	1340	Ø	Ø	20.9	Ø	Ø
Upwind background	0.04	1340	Ø	Ø	20.9	Ø	Ø
** Chain link fence by elder home	0.045	1340	Ø	Ø	20.9	Ø	Ø
N/A							

CONTINUED ON REVERSE SIDE

* inconsistent air patterns. Monitor placed on RMA boundary closest to work in progress. Located on south side next to elderly apartments. - RMC

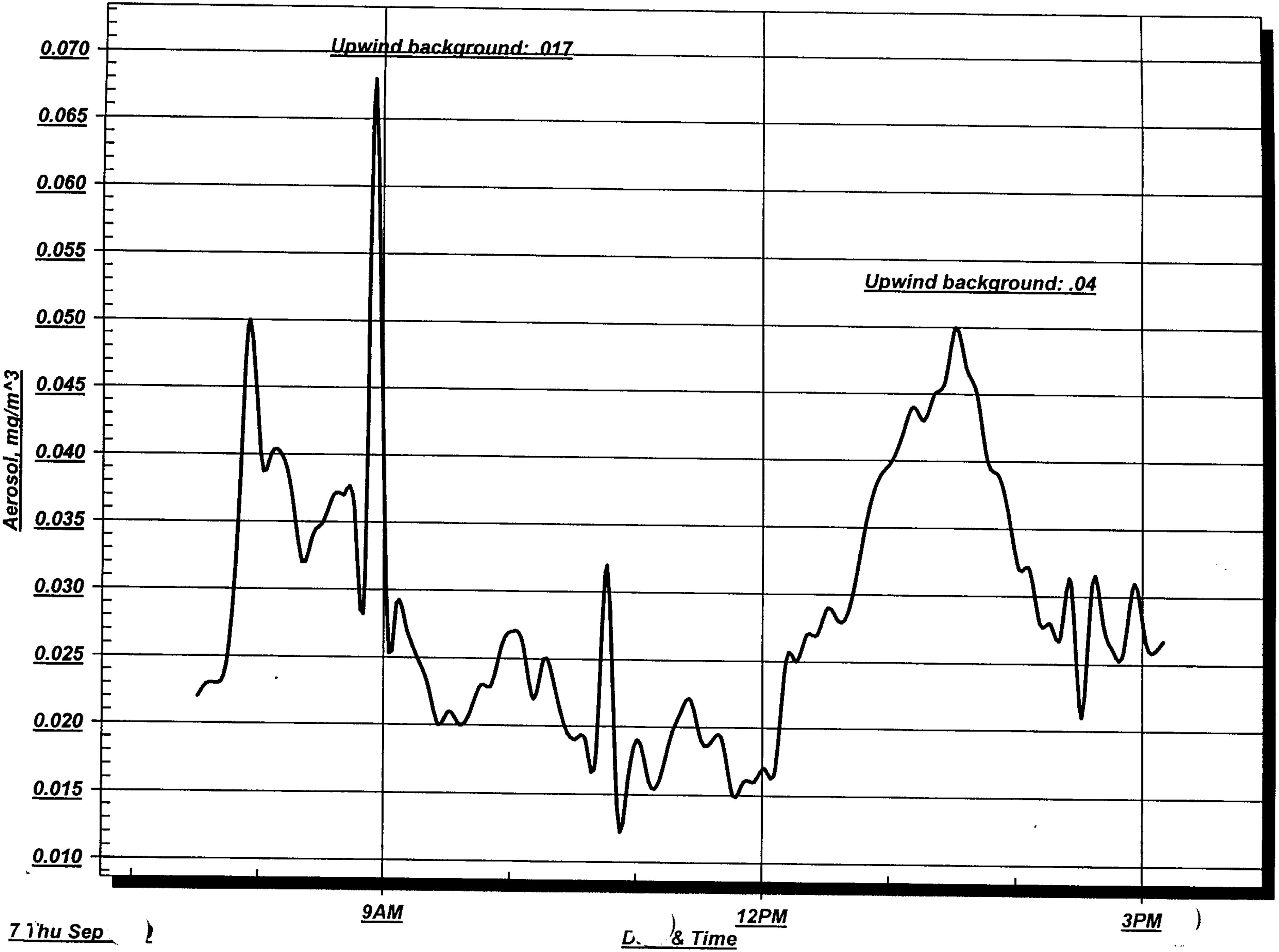
** Monitor moved to chain link fence by elderly apartments - RMC

Current Graph:9-7-00BallodDust
Start time: 07:26:07 09/07/2000   Stop time: 15:11:07 09/07/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	0.029
Lowest point:	0.014
Time	10:51:07
Date	09/07/2000
Highest point:	0.068
Time	08:56:07
Date	09/07/2000
Log interval: hh:mm:ss	00:05:00

Maywood Ballod Project

Downwind Perimeter Dust Concentrations



AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: PILOT RMA	WEATHER CONDITIONS: Hazey, wind from ~~West~~ east	DATE: 9-8-00
PERSON PERFORMING MONITORING: RMCoblentz		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See HWP # 14, 15, 16, & 17			Dust Trak	22007
N/A				

INSTRUMENTS CALIBRATION	PPE IN USE:	PROCESS:
YES [X] NO [ ]	See HWP	Processing Soils

MONITORING DATA

LOCATION AND REMARKS	TIME	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H_2S (ppm)
Stationary downwind monitoring West perimeter (see attached graph)						
N/A						

CONTINUED ON REVERSE SIDE

Mayood Pilot Study
Dust Monitoring Summary, 9-8-00

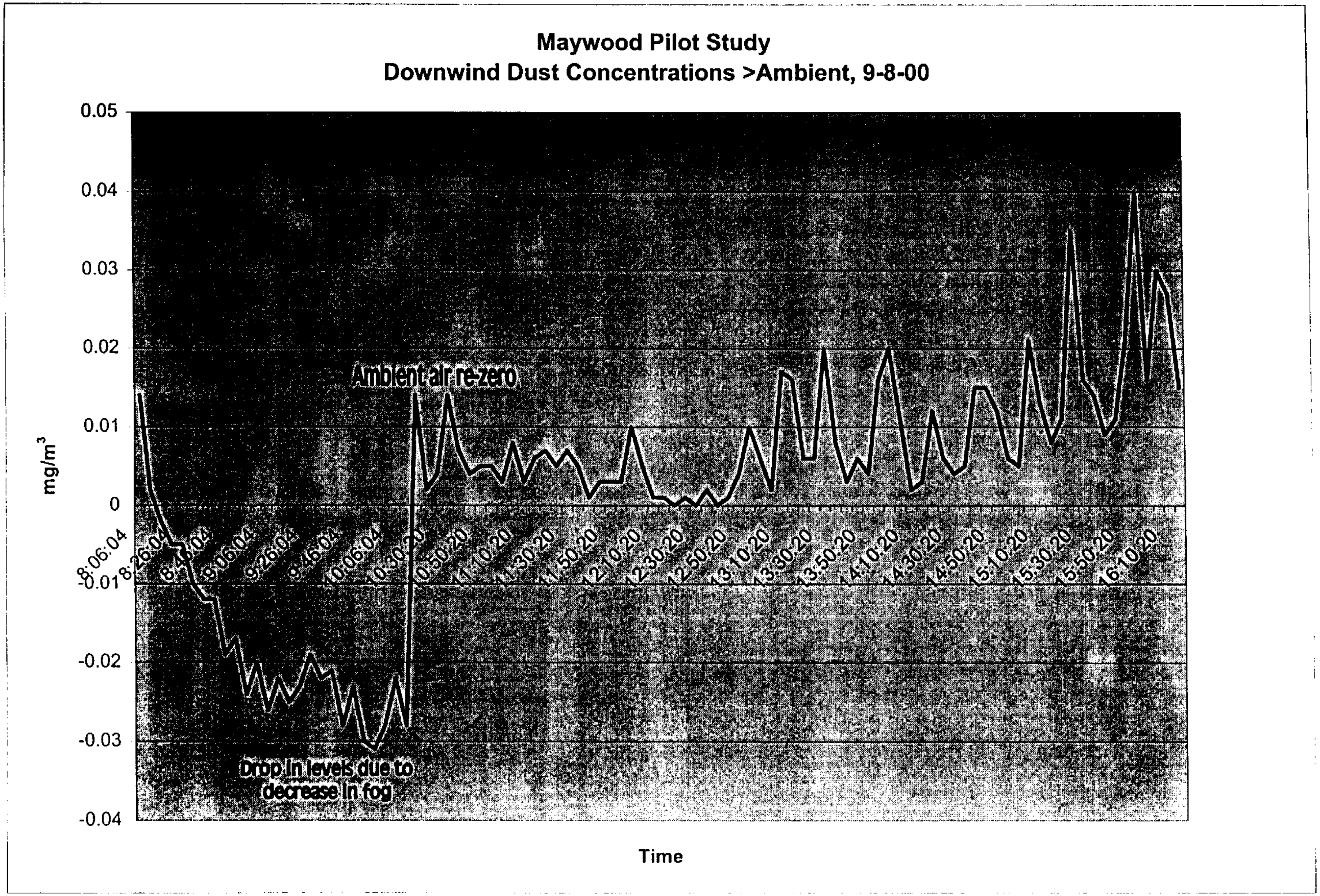
Model:	Dust Trak
Serial Number:	22007
Test ID:	Sample run, Part 1
Test Abbreviation:	
Start Date:	09/08/2000
Start Time:	8:01:04
Duration (dd:hh:mm:ss):	00:02:10:00
Time constant (seconds):	10
Log Interval (mm:ss):	5:00
Number of points:	26
Notes:	

Statistics	Channel:	Aerosol
	Units:	mg/m^3
	Average:	-0.018
	Minimum:	-0.031
	Time of Minimum:	9:56:04
	Date of Minimum:	09/08/2000
	Maximum:	0.014
	Time of Maximum:	8:06:04
	Date of Maximum:	09/08/2000
Calibration	Sensor:	Aerosol
	Cal. date	09/23/1999

Model:	Dust Trak
Serial Number:	22007
Test ID:	Sample run, Part 2
Test Abbreviation:	
Start Date:	09/08/2000
Start Time:	10:15:20
Duration (dd:hh:mm:ss):	00:06:00:00
Time constant (seconds):	10
Log Interval (mm:ss):	5:00
Number of points:	72
Notes:	

Statistics	Channel:	Aerosol
	Units:	mg/m^3
	Average:	0.009
	Minimum:	0
	Time of Minimum:	12:20:20
	Date of Minimum:	09/08/2000
	Maximum:	0.04
	Time of Maximum:	15:55:20
	Date of Maximum:	09/08/2000
Calibration	Sensor:	Aerosol
	Cal. date	09/23/1999

Ambient air re-zero performed at 10:15



Maywood Pilot Study
Downwind Dust Concentrations >Ambient, 9-8-00
mg/m3
0.05
0.04
0.03
0.02
0.01
0
-0.01
-0.02
-0.03
-0.04
Ambient air re-zero
Drop in levels due to decrease in fog
8:06:04
8:26:04
9:06:04
9:26:04
9:46:04
Time

AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: Soils Aquisition	WEATHER CONDITIONS: Hazey, wind from ~~west~~ RMA east	DATE: 9-8-00
PERSON PERFORMING MONITORING: RMCoblentz		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See HWP #14, 15, 16 & 17			Dust Trak	22008

INSTRUMENTS CALIBRATION	PPE IN USE:	PROCESS:
YES [X] NO [ ]	See HWP	Soils excavation

MONITORING DATA

LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H2S (ppm)
Stationary downwind West ~~East~~ RMA boundary (See attached graph)							

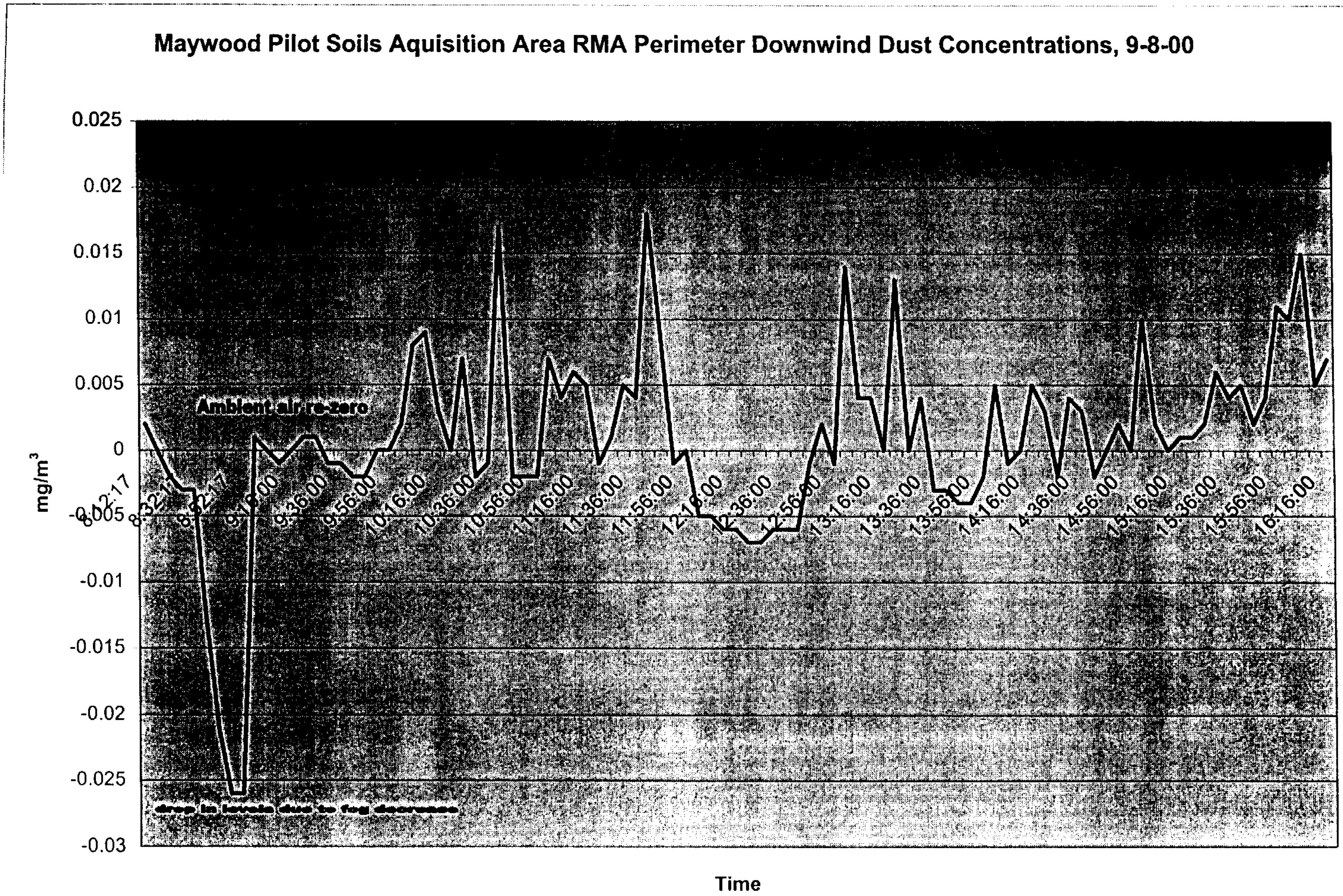
CONTINUED ON REVERSE SIDE

Soils Aquisition Area
Dust Monitoring Summary, 9-8-00

Model:	Dust Trak	Model:	Dust Trak
Serial Number:	22008	Serial Nu	22008
Test ID:	Sample run, Part 1	Test ID:	Sample run, Part 2
Test Abbreviation:		Test Abbreviation:	
Start Date:	9/8/00	Start Dat	9/8/00
Start Time:	8:07:17	Start Tim	8:56:00
Duration (dd:hh:mm:ss):	00:00:45:00	Duration	00:07:20:00
Time constant (seconds):	10	Time con	10
Log Interval (mm:ss):	5:00	Log Inter	5:00
Number of points:	9	Number	88
Notes:		Notes:	

Statistics	Channel:	Aerosol	Statistics	Channel:	Aerosol
	Units:	mg/m^3		Units:	mg/m^3
	Average:	-0.01		Average:	0.002
	Minimum:	-0.026		Minimum:	-0.007
	Time of Minimum:	8:47:17		Time of Minimum:	12:21:00
	Date of Minimum:	9/8/00		Date of Minimum:	9/8/00
	Maximum:	0.002		Maximum:	0.018
	Time of Maximum:	8:12:17		Time of Maximum:	11:41:00
	Date of Maximum:	9/8/00		Date of Maximum:	9/8/00
Calibration	Sensor:	Aerosol	Calibratio	Sensor:	Aerosol
	Cal. date	9/23/99		Cal. date	9/23/99

Ambient air re-zero performed at 08:56



Maywood Pilot Soils Aquisition Area RMA Perimeter Downwind Dust Concentrations, 9-8-00
0.025
0.02
0.015
0.01
0.005
0
-0.005
-0.01
-0.015
-0.02
-0.025
-0.03
mg/m^3
Ambient air re-zero
drop in levels due to fog decrease
8:52:17
9:16:00
9:36:00
9:56:00
10:16:00
10:36:00
10:56:00
11:16:00
11:36:00
11:56:00
12:16:00
12:36:00
12:56:00
13:16:00
13:36:00
13:56:00
14:16:00
14:36:00
14:56:00
15:16:00
15:36:00
15:56:00
16:16:00
Time

AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: Pilot	WEATHER CONDITIONS: Hazey, wind from the ~~W~~ East	DATE: 9-11-00
PERSON PERFORMING MONITORING: [illegible signature]		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See HWP 14, 15, 16, & 17			Dust Trak	~~2200~~ ~~22070~~ 22007
N/A				

INSTRUMENTS CALIBRATION	PPE IN USE:	PROCESS:
YES [X] NO [ ]	See HWP	Soil Processing

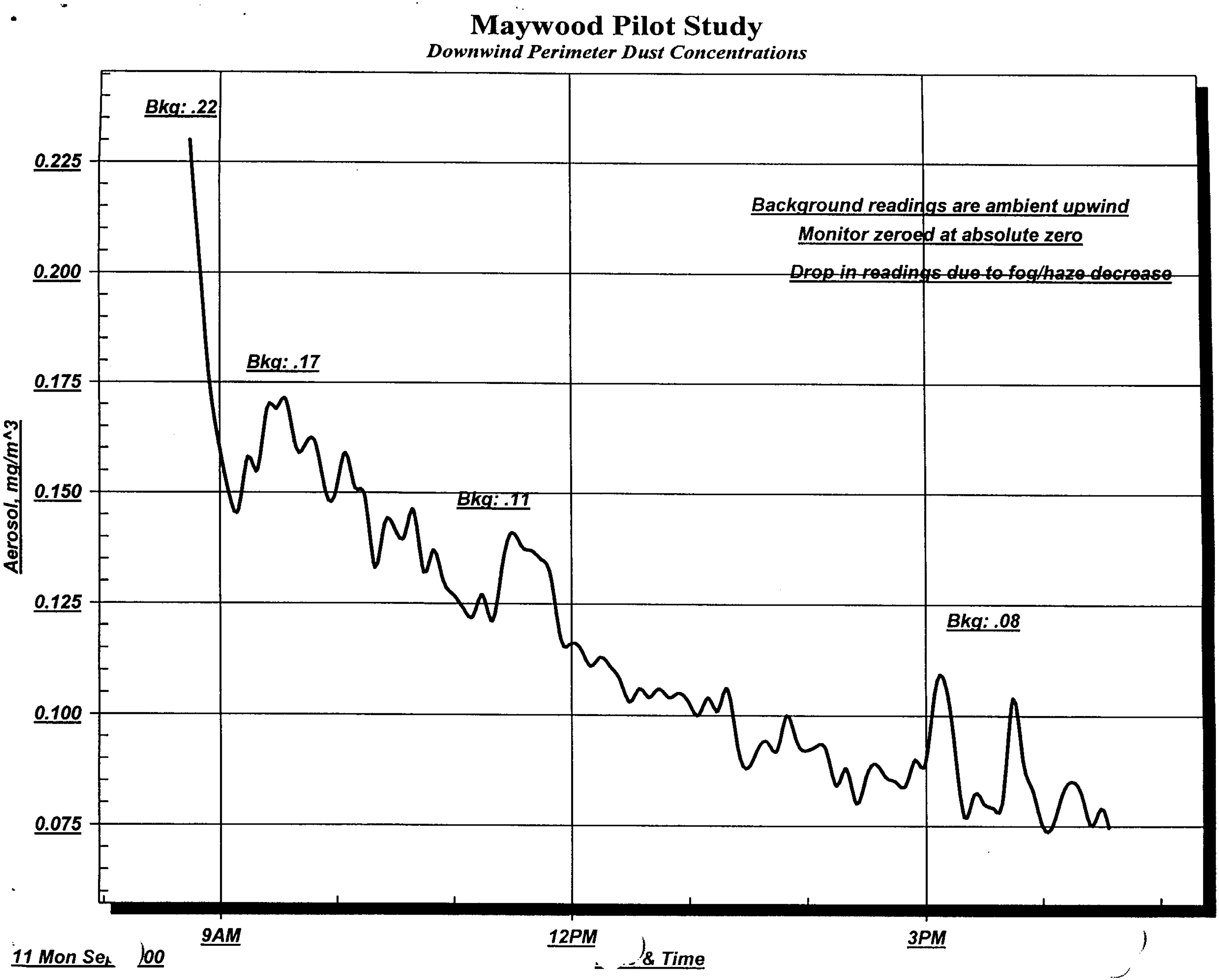
MONITORING DATA

LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H2S (ppm)
Stationary monitoring West perimeter (see attached graph)							
N/A							

CONTINUED ON REVERSE SIDE

Current Graph:9-11-00Pilot
Start time: 08:39:31 09/11/2000 Stop time: 16:34:31 09/11/2000

Legend:	Aerosol
Channel:	Aerosol
(Units)	mg/m^3
Average:	0.116
Lowest point:	0.073
Time	16:34:31
Date	09/11/2000
Highest point:	0.230
Time	08:44:31
Date	09/11/2000
Log interval:	00:05:00
hh:mm:ss	



Maywood Pilot Study
Downwind Perimeter Dust Concentrations
Bkg: .22
Bkg: .17
Bkg: .11
Bkg: .08
Background readings are ambient upwind
Monitor zeroed at absolute zero
Drop in readings due to fog/haze decrease
Aerosol, mg/m^3
0.225
0.200
0.175
0.150
0.125
0.100
0.075
9AM
12PM
3PM
& Time

AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: Soils Aquisition	WEATHER CONDITIONS: Hazey, wind from the east	DATE: 9-11-00
PERSON PERFORMING MONITORING: RM Coblentz		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See HWP 14, 15, 16, & 17			Dust Trak	22008
N/A				

INSTRUMENTS CALIBRATION	PPE IN USE	PROCESS
YES [X] NO [ ]	Soil exc See HWP	Soil excavation

MONITORING DATA

LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H_2S (ppm)
Stationary monitoring at Downwind (west) RMA boundary (See attached graph)							
N/A							

CONTINUED ON REVERSE SIDE

Current Graph:9-11-00SoilAqPart1
Start time: 07:33:48 09/11/2000   Stop time: 13:03:48 09/11/2000

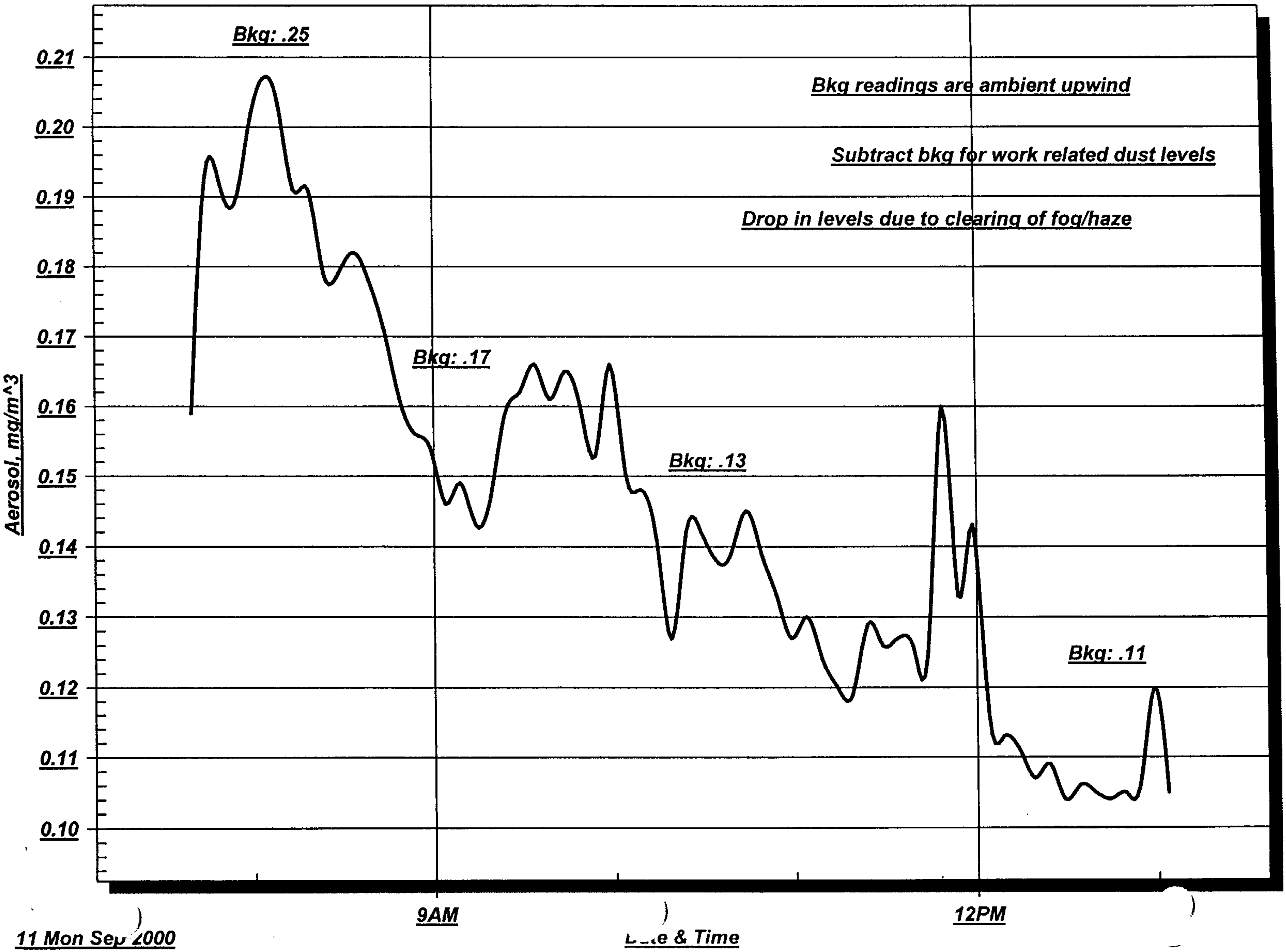
Legend:	Aerosol
Channel:	Aerosol
(Units)	mg/m^3
Average:	0.146
Lowest point:	0.103
Time	13:03:48
Date	09/11/2000
Highest point:	0.207
Time	08:03:48
Date	09/11/2000
Log interval: hh:mm:ss	00:05:00

Current Graph:9-11-00SoilAqPart2
Start time: 13:07:27 09/11/2000 Stop time: 15:27:27 09/11/2000

Legend:	Aerosol
Channel:	Aerosol
(Units)	mg/m^3
Average:	-0.009
Lowest point:	-0.021
Time	15:22:27
Date	09/11/2000
Highest point:	0.001
Time	13:17:27
Date	09/11/2000
Log interval:	00:05:00
hh:mm:ss	

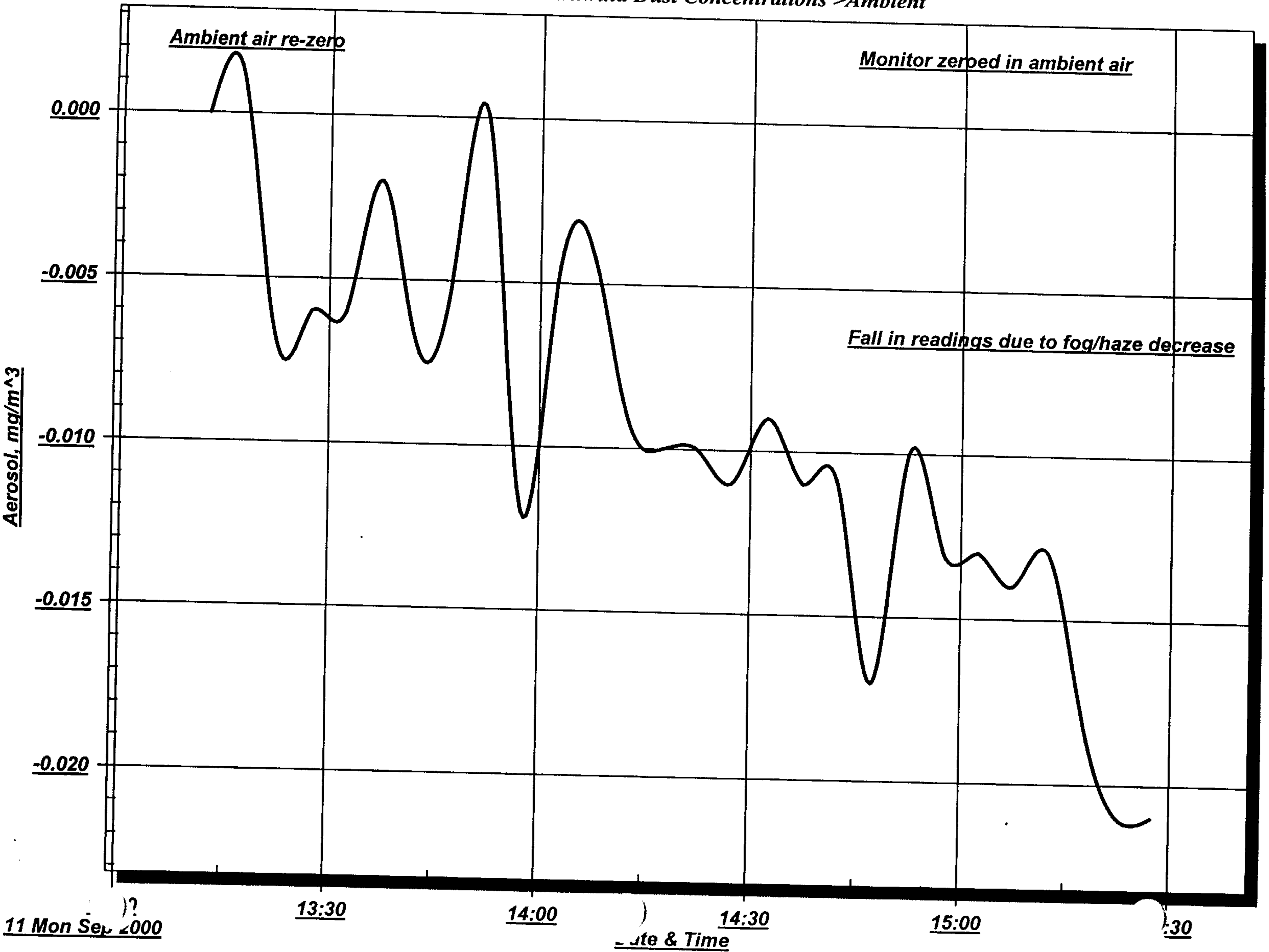
Soils Aquisition Area

RMA Perimeter Downwind Dust Concentrations



Soils Aquisition Area

RMA Perimeter Downwind Dust Concentrations >Ambient



AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: PILOT	WEATHER CONDITIONS: HAzey, wind from the south	DATE: 9-12-00
PERSON PERFORMING MONITORING: RMCoblentz		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See HWP 14, 15, 16, & 17			Dust Trak	22007
N/A				

INSTRUMENTS CALIBRATION YES [X] NO [ ]

PPE IN USE: See HWP

PROCESS: Soil Processing

MONITORING DATA

LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H2S (ppm)
Stationary monitoring at north perimeter (see attached graph)							
N/A							

CONTINUED ON REVERSE SIDE

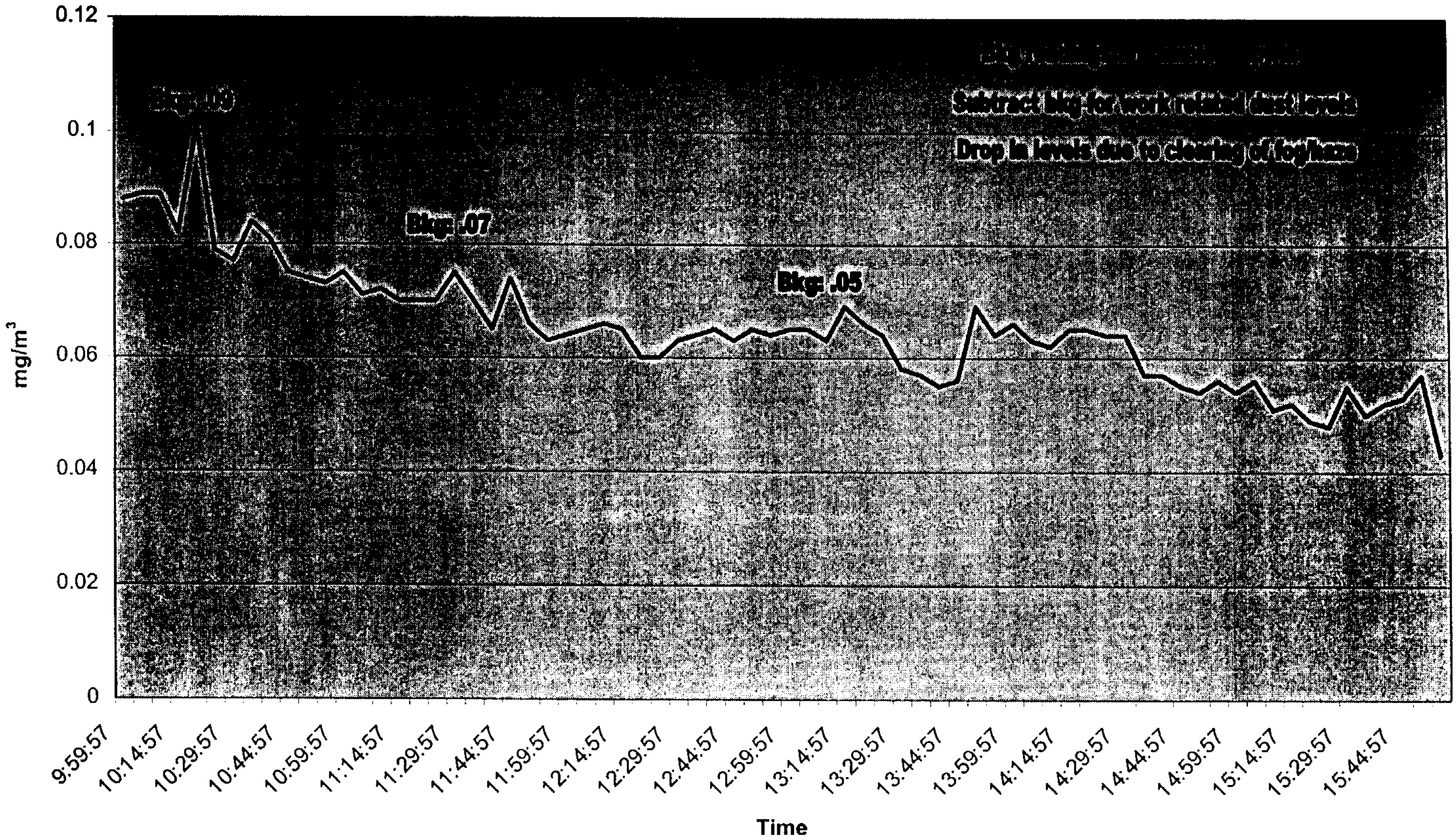
FUSRAP S-023 (09/22/94)

Maywood Pilot Study
Dust Monitoring Summary, 9-12-00

Model:	Dust Trak	Statistics	Channel:	Aerosol
Serial Number:	22007		Units:	mg/m^3
Test ID:	1		Average:	0
Test Abbreviation:			Minimum:	0.043
Start Date:	9/12/00		Time of Minimum:	15:54:57
Start Time:	9:54:57		Date of Minimum:	9/12/00
Duration (dd:hh:mm:ss):	-11501:-3:-59:-27		Maximum:	0.101
Time constant (seconds):	10		Time of Maximum:	10:19:57
Log Interval (mm:ss):	5:00		Date of Maximum:	9/12/00
Number of points:	72			
Notes:				

All readings are gross readings. Subtract Bkg for net dust level (See chart)

Maywood Pilot Study
Downwind Perimeter Dust Concentrations, 9-12-00

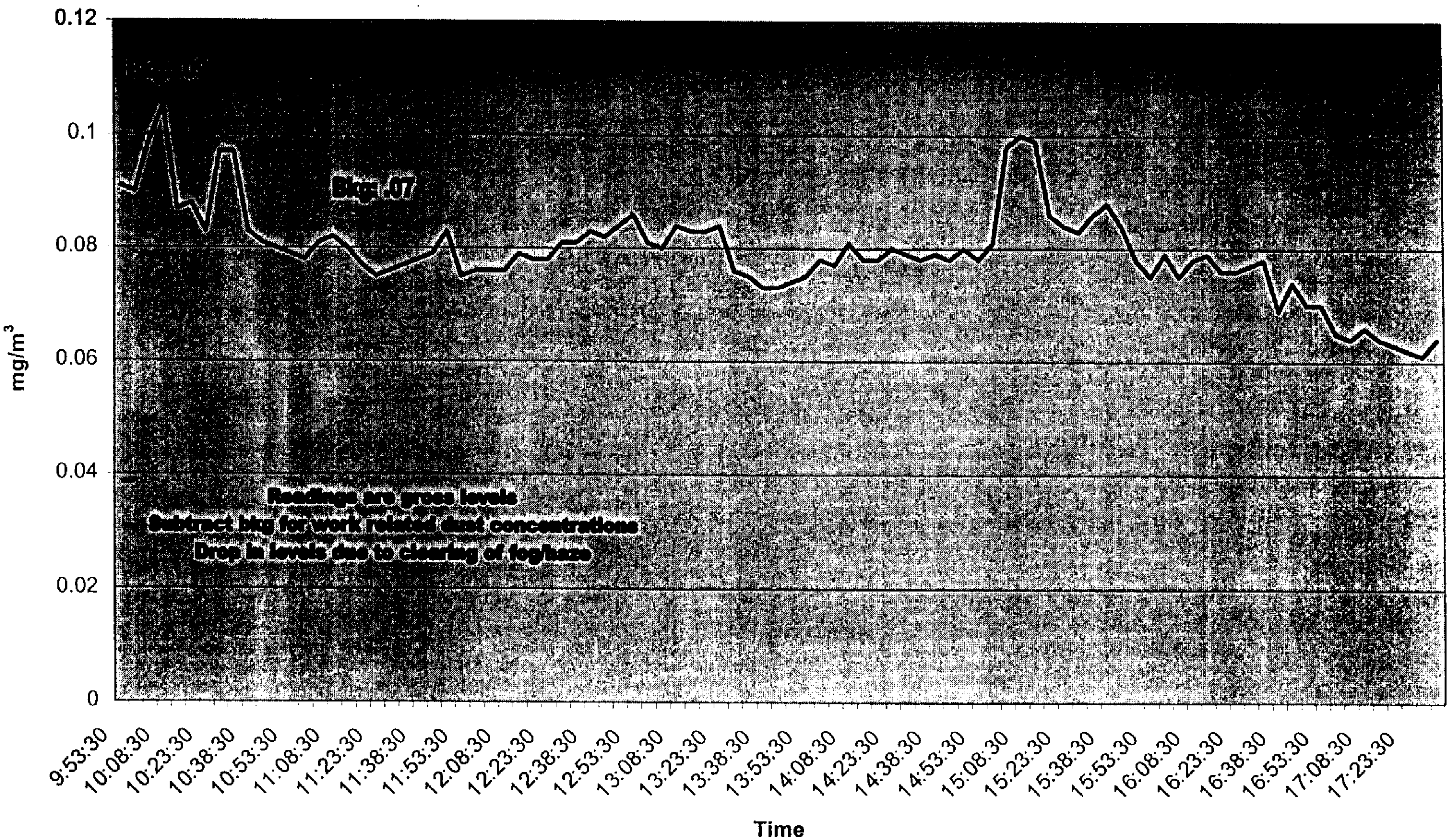


Maywood Soils Aquisition Area
Dust Monitoring Summary

Model:	Dust Trak	Statistics	Channel:	Aerosol
Serial Number:	22008		Units:	mg/m^3
Test ID:	Soil Acquisition Area		Average:	0.08
Test Abbreviation:			Minimum:	0.061
Start Date:	9/12/00		Time of Minimum:	17:28:30
Start Time:	9:48:30		Date of Minimum:	9/12/00
Duration (dd:hh:mm:ss):	00:07:45:00		Maximum:	0.105
Time constant (seconds):	10		Time of Maximum:	10:08:30
Log Interval (mm:ss):	5:00		Date of Maximum:	9/12/00
Number of points:	93			
Notes:		Calibration	Sensor:	Aerosol
			Cal. date	9/23/99

Readings are gross levels. Subtract bkg for net dust levels. (see chart)

Maywood Soils Aquisition Area
Downwind Perimeter Dust Concentrations, 9-12-00



AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: Soils Aquisition	WEATHER CONDITIONS: Cloudy, Fog - clearing @ ~1000 wind out of the west	DATE: 9-13-00
PERSON PERFORMING MONITORING: RMCoblentz		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See HWP 14, 15, 16, & 17			Dust Trak	21760
N/A				

INSTRUMENTS CALIBRATION	PPE IN USE:	PROCESS:
YES [✓] NO [ ]	See HWP	Soil Excavation

MONITORING DATA

LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H2S (ppm)
Stationary monitoring downwind of RMA on east side (see chart for levels)							
N/A							

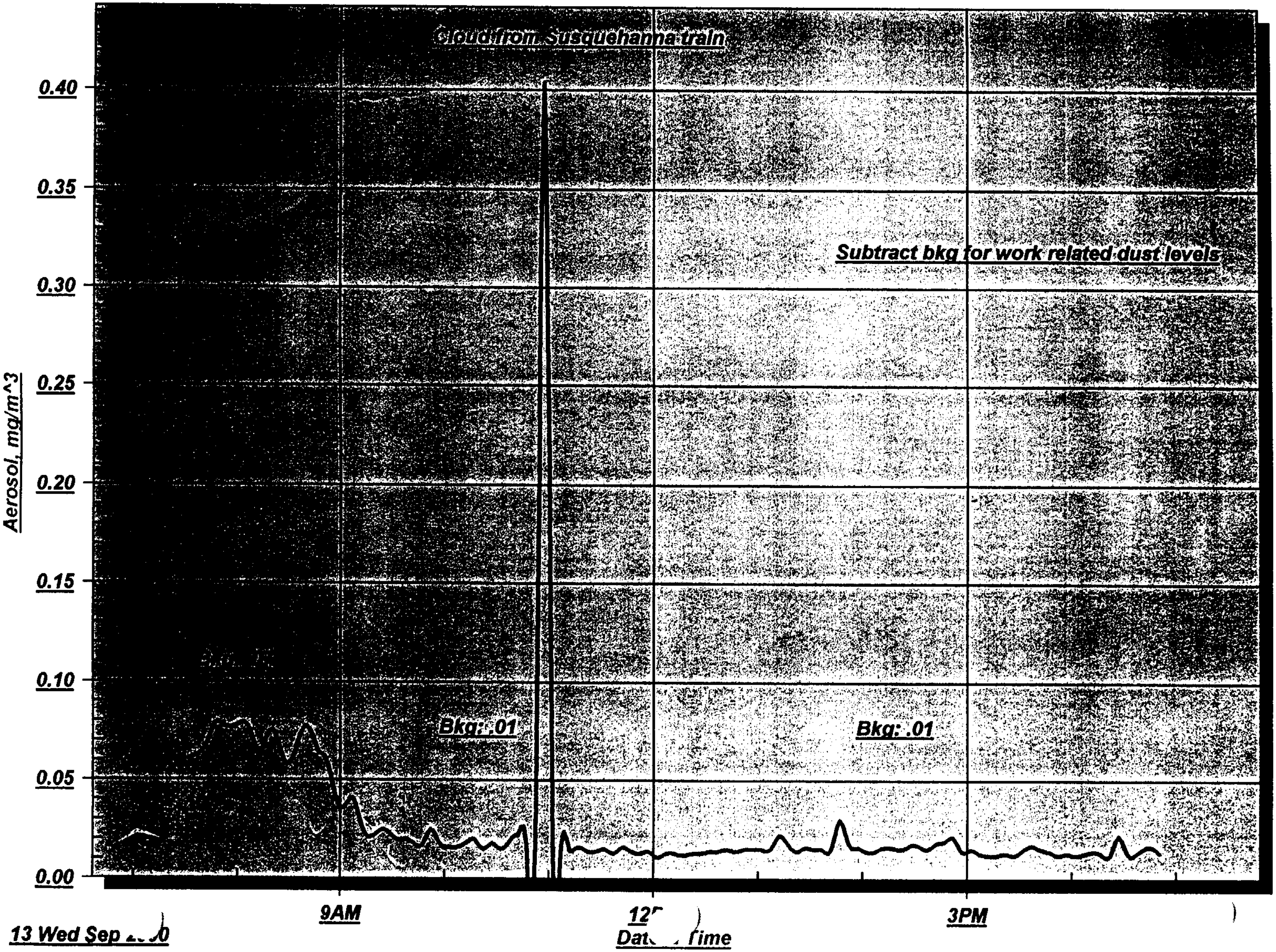
CONTINUED ON REVERSE SIDE

Current Graph: 9-13-00SoilAq
Start time: 07:27:01 09/13/2000 Stop time: 16:52:01 09/13/2000

Legend:	Aerosol
Channel:	Aerosol
(Units)	mg/m^3
Average:	0.028
Lowest point:	0.011
Time	12:02:01
Date	09/13/2000
Highest point:	0.404
Time	10:57:01
Date	09/13/2000
Log interval:	00:05:00
hh:mm:ss	

Soils Aquisition Area

Downwind Perimeter Dust Concentrations



AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: PILOT	WEATHER CONDITIONS: Cloudy, fog, clearing @ ~1000 / Wind from the west	DATE: 9-13-00
PERSON PERFORMING MONITORING: RMCoblentz		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See HWP # 14, 15, 16, & 17			DUST TRAK	21762
N/A				

INSTRUMENTS CALIBRATION YES [X] NO [ ]	PPE IN USE: See HWP	PROCESS: SOIL Processing

MONITORING DATA

LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H2S (ppm)
UPWIND Background	0800	0.1	N/A				
EAST RMA perimeter (gross reading)	0800	0.115					
UPWIND Background	1000	0.02					
EAST RMA perimeter (gross reading)	1000	0.025					
UPWIND Background	1300	0.01					
EAST RMA perimeter (gross reading)	1300	0.018					
UPWIND Background	1400	0.01					
EAST RMA perimeter (gross reading)	1400	0.012					
EAST RMA perimeter (gross reading)	1630	0.021					
N/A							

CONTINUED ON REVERSE SIDE

AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: PILOT	WEATHER CONDITIONS: Clear, wind out of the NNE	DATE: 9-14-00
PERSON PERFORMING MONITORING: RMCoblentz	Wind out of ESE after 1030	

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See HWP 14, 15, 16, & 17			DUST TRAK	21762
			Multi-Rae	21804
			DUST TRAK	21763

INSTRUMENTS CALIBRATION YES [X] NO [ ]

PPE IN USE: See HWP

PROCESS: SOIL Processing

MONITORING DATA

LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H2S (ppm)
Downwind (South) of RMA	0800	.029					
upwind Ambient background	0800	.02					
Downwind (WEST) of RMA	1030	.035					
upwind ambient background	1030	.03					
Downwind (West) of RMA	1330	.042					
upwind background	1330	.03					
I/S RMA, Stepan pile Remnants (excavating)	1400	.057	Ø	Ø	20.8	Ø	Ø
STEPAN Soils Load area	1410	.052	Ø	Ø	20.6	Ø	Ø

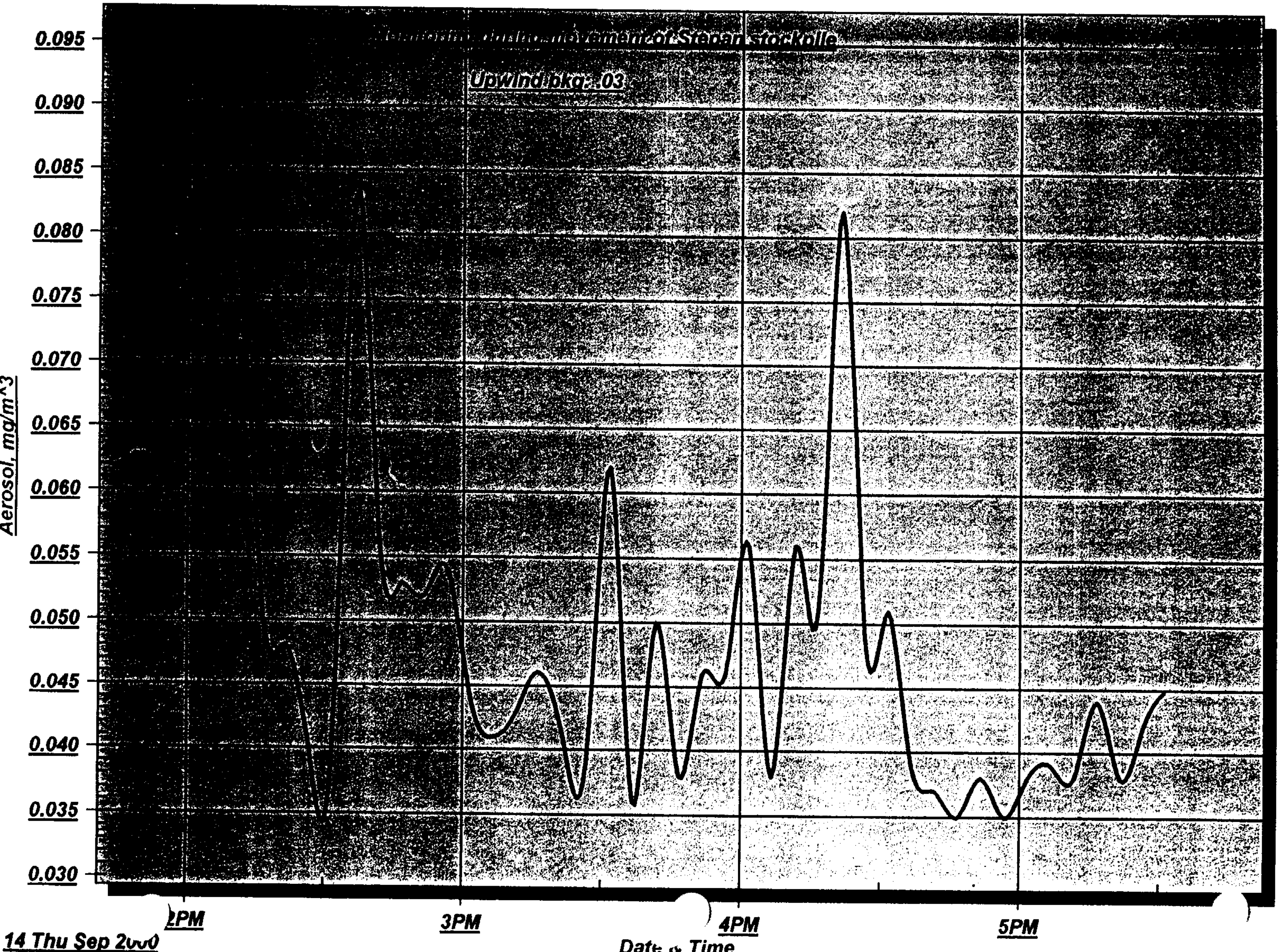
CONTINUED ON REVERSE SIDE

Current Graph: 9-14-00 PIlot Work Area
Start time: 13:56:40 09/14/2000 Stop time: 17:31:40 09/14/2000

Legend:	Aerosol
Channel:	Aerosol
(Units)	mg/m^3
Average:	0.049
Lowest point:	0.035
Time	16:46:40
Date	09/14/2000
Highest point:	0.092
Time	14:01:40
Date	09/14/2000
Log interval:	00:05:00
hh:mm:ss	

Maywood Pilot Study

Work Area Dust Concentrations



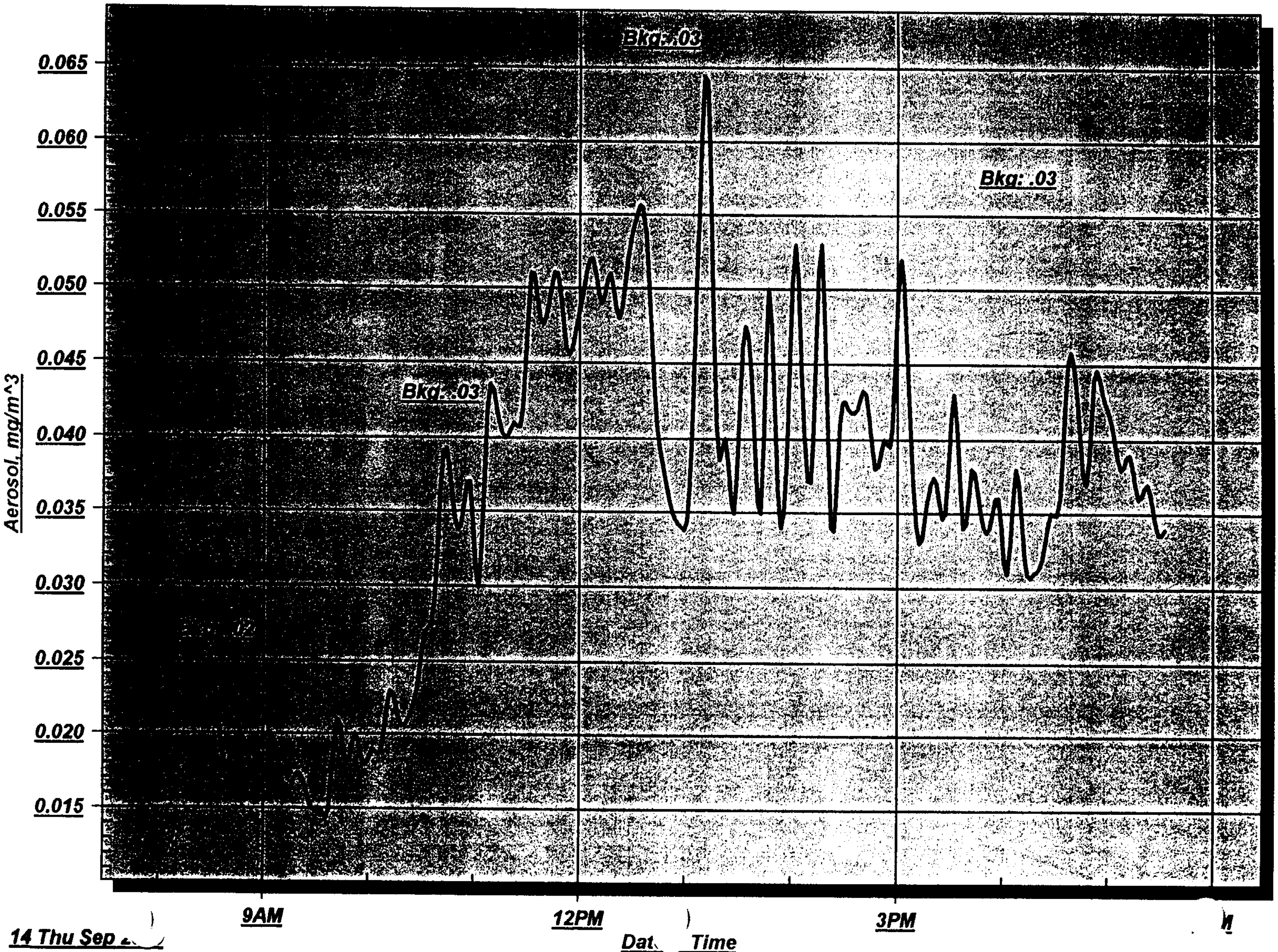
Current Graph: 9-14-00PilotDW

Start time: 08:17:23 09/14/2000 Stop time: 17:32:23 09/14/2000

Legend:	Aerosol
Channel:	Aerosol
(Units)	mg/m^3
Average:	0.036
Lowest point:	0.015
Time	09:27:23
Date	09/14/2000
Highest point:	0.064
Time	13:12:23
Date	09/14/2000
Log interval:	00:05:00
hh:mm:ss	

Maywood Pilot Study

Downwind Perimeter Dust Concentrations



AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: Soils Aquisition	WEATHER CONDITIONS: Clear wind from the Southeast	DATE: 9-14-00
PERSON PERFORMING MONITORING: RMCoblentz		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See HWP 14, 15, 16, & 17			DUST TRAK	21760
			MULT-RAE	~~21810~~ 21804
N/A				

INSTRUMENTS CALIBRATION YES (X) NO ( )

PPE IN USE: See HWP

PROCESS: SOIL EXCAVATION

MONITORING DATA

LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H2S (ppm)
Stationary Dust Monitoring at perimeter fence NW of RMA (see chart)							
Inside slug hole after excavation	1700	N/A	Ø	Ø	20.8	Ø	Ø
N/A							

CONTINUED ON REVERSE SIDE

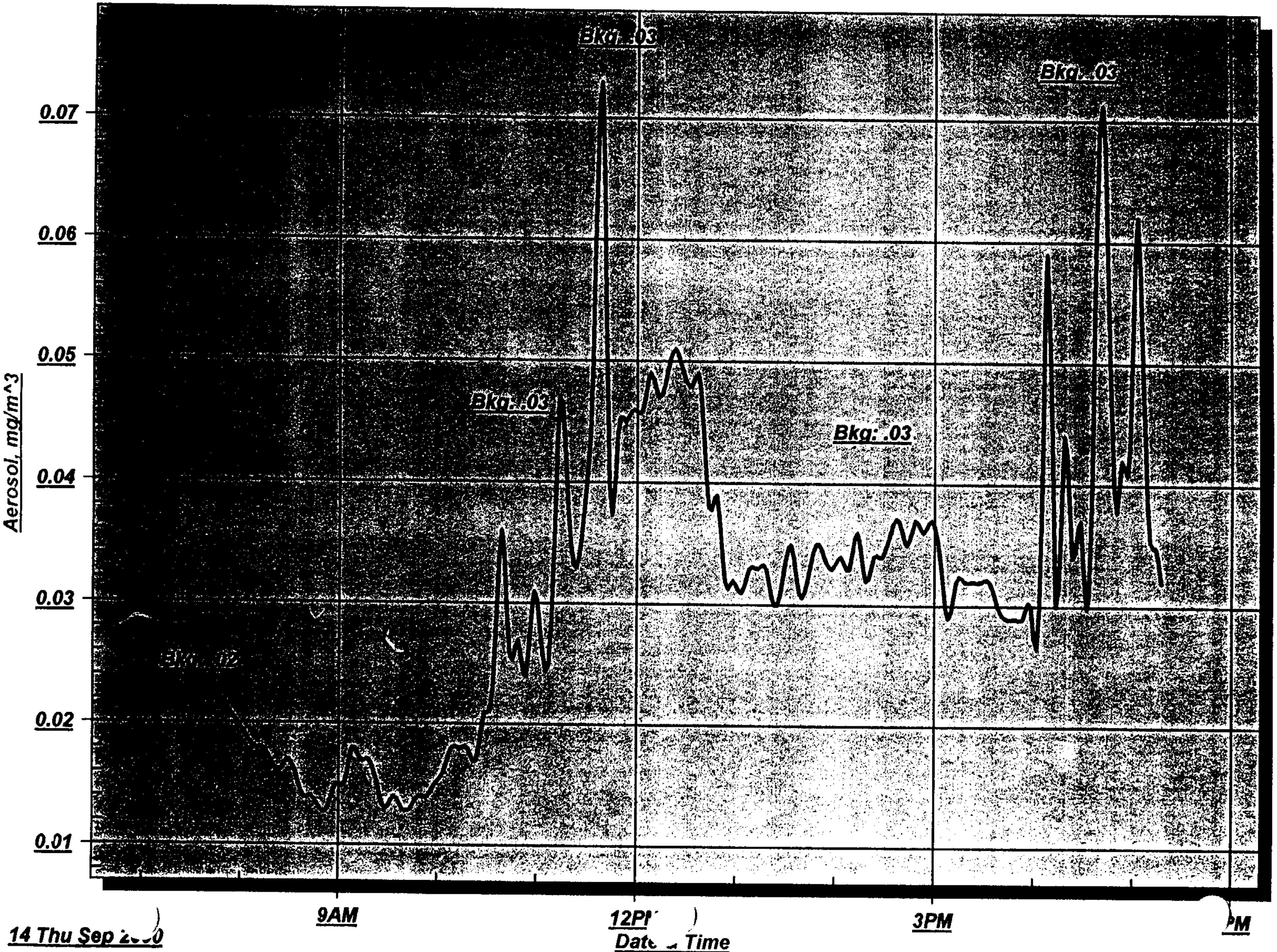
Current Graph: 9-14-00 Soils Aquisition

Start time: 07:23:13 09/14/2000 Stop time: 17:18:13 09/14/2000

Legend:	Aerosol
Channel:	Aerosol
(Units)	mg/m^3
Average:	0.031
Lowest point:	0.013
Time	08:48:13
Date	09/14/2000
Highest point:	0.073
Time	11:38:13
Date	09/14/2000
Log interval:	00:05:00
hh:mm:ss	

Pilot Soils Aquisition Area

Downwind Perimeter Dust Concentrations



AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: Pilot	WEATHER CONDITIONS: Clear, wind from the west	DATE: 9-15-00
PERSON PERFORMING MONITORING: RM Coblentz		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See HWP 14, 15, 16, & 17			DUST TRAK	21762
N/A			DUST TRAK	21763
			N/A	

INSTRUMENTS CALIBRATION	PPE IN USE:	PROCESS:
YES [X] NO [ ]	See HWP	Whitney disassembly

MONITORING DATA

LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H2S (ppm)
Stationary dust monitoring on east RMA boundary (see chart)							
Stationary dust monitoring in RMA work area immediately downwind of work (See chart)							
N/A							

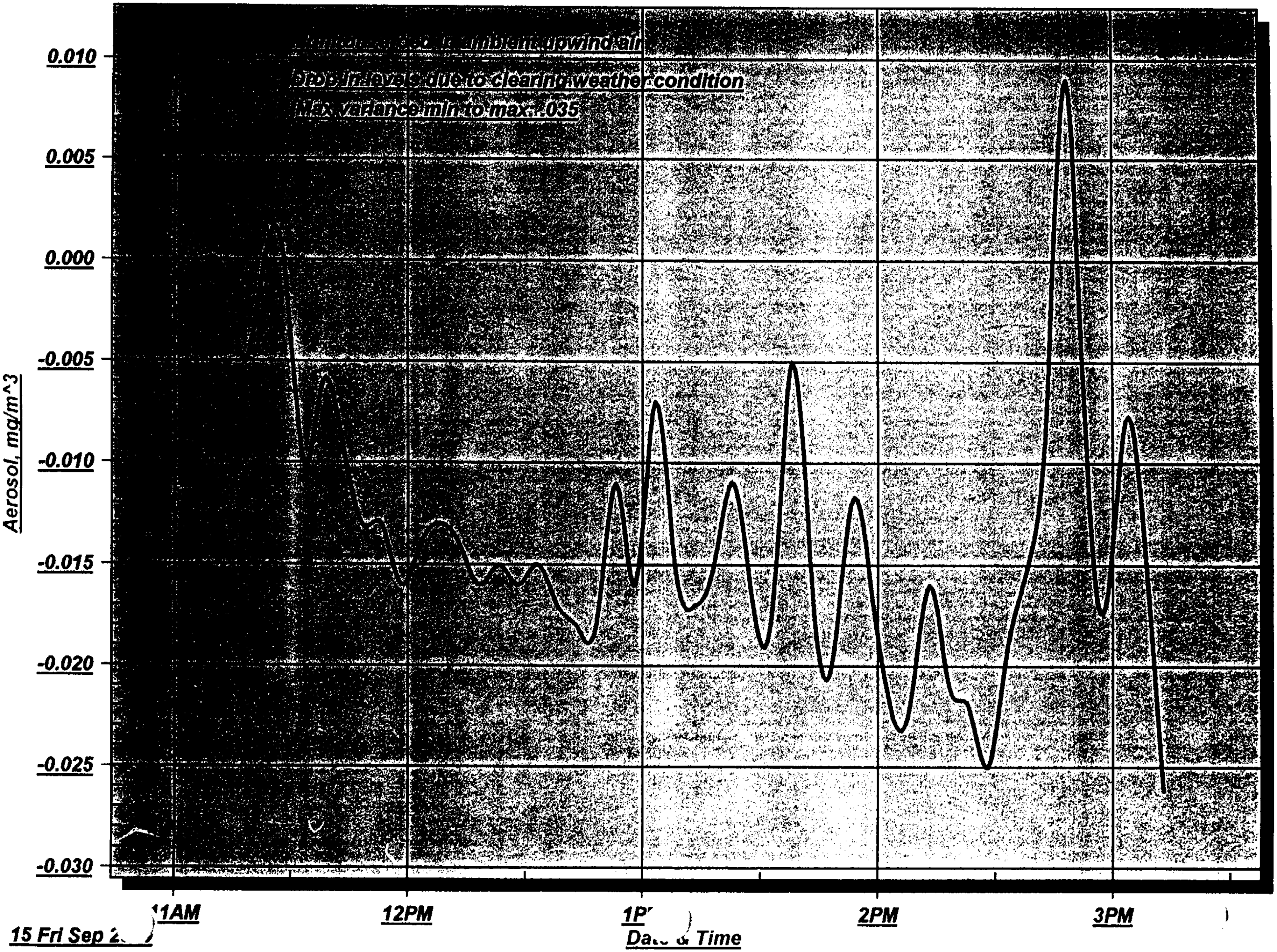
CONTINUED ON REVERSE SIDE

Current Graph: 9-15-00 Pilot RMA Work Area
Start time: 11:03:11 09/15/2000 Stop time: 15:13:11 09/15/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	-0.013
Lowest point: Time Date	-0.027 15:13:11 09/15/2000
Highest point: Time Date	0.009 14:48:11 09/15/2000
Log interval: hh:mm:ss	00:05:00

Maywood Pilot Study

Work Area Dust Concentrations



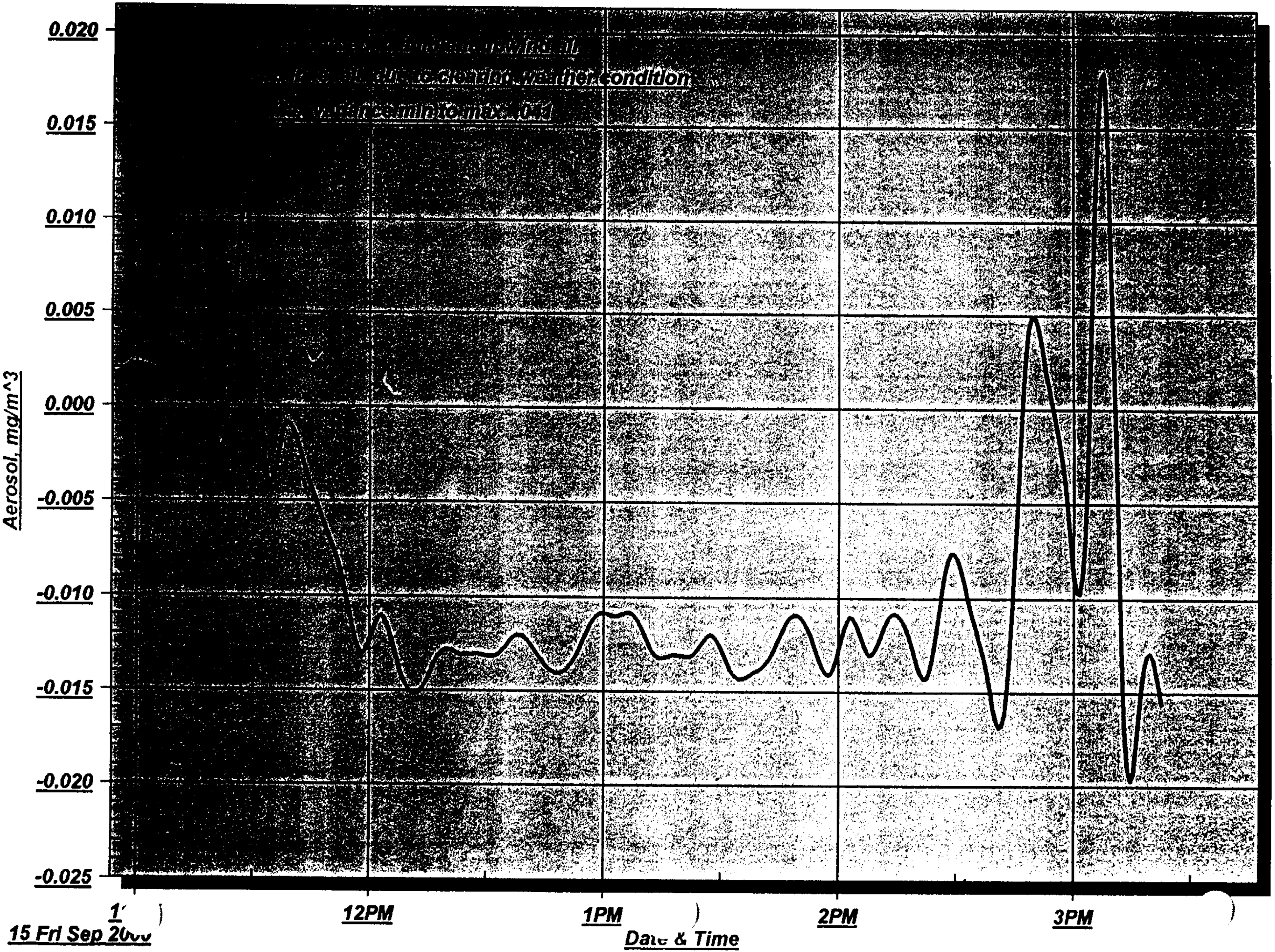
Current Graph: 9-15-00 Pilot D/W

Start time: 11:12:55 09/15/2000 Stop time: 15:22:55 09/15/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	-0.009
Lowest point:	-0.016
Time	15:12:55
Date	09/15/2000
Highest point:	0.018
Time	15:07:55
Date	09/15/2000
Log interval: hh:mm:ss	00:05:00

Maywood Pilot Study

RMA Perimeter Downwind Dust Concentrations



AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: PILOT

WEATHER CONDITIONS: Clear, wind from the NW

DATE: 9-16-00

PERSON PERFORMING MONITORING: RMCablentz

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See HWP 14, & 15			DUST TRAK	21760
N/A			DUST TRACK	21762
			N/A	

INSTRUMENTS CALIBRATION YES [X] NO [ ]

PPE IN USE: See HWP

PROCESS: Pressure washing whitney plant

MONITORING DATA

LOCATION AND REMARKS	TIME	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H_2S (ppm)
Stationary work area dust monitoring southeast work area (see chart)						
Stationary ~~South~~ Rmc RMA boundary dust monitoring South east of work activities (see chart)						
N/A						

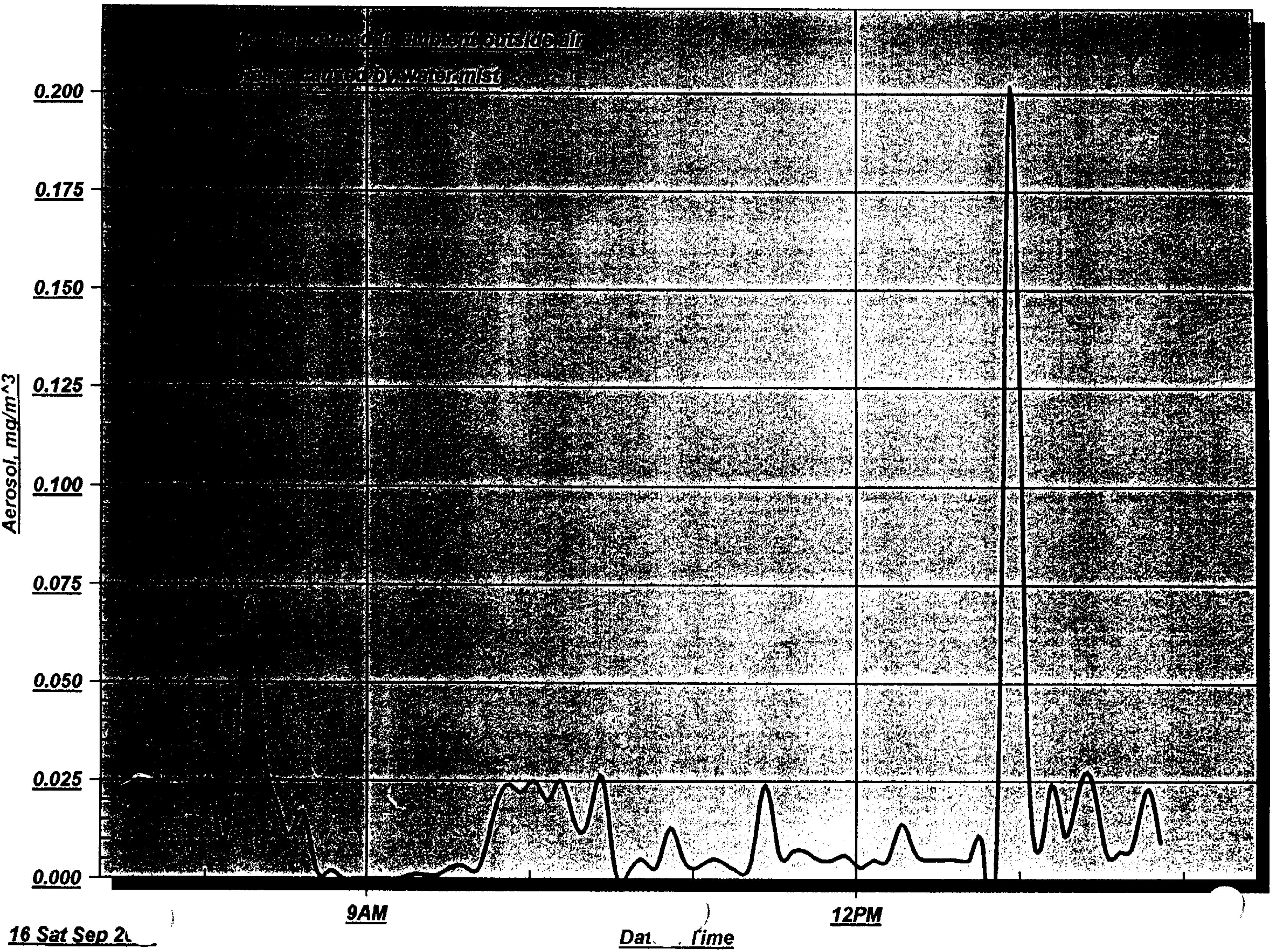
CONTINUED ON REVERSE SIDE

Current Graph: 9-16-00 Pilot Work Area
Start time: 07:51:28 09/16/2000 Stop time: 13:51:28 09/16/2000

Legend:	Aerosol
Channel:	Aerosol
(Units)	mg/m^3
Average:	0.015
Lowest point:	0.000
Time	08:51:28
Date	09/16/2000
Highest point:	0.202
Time	12:56:28
Date	09/16/2000
Log interval:	00:05:00
hh:mm:ss	

Maywood Pilot Study

Work Area Dust Concentrations >Ambient



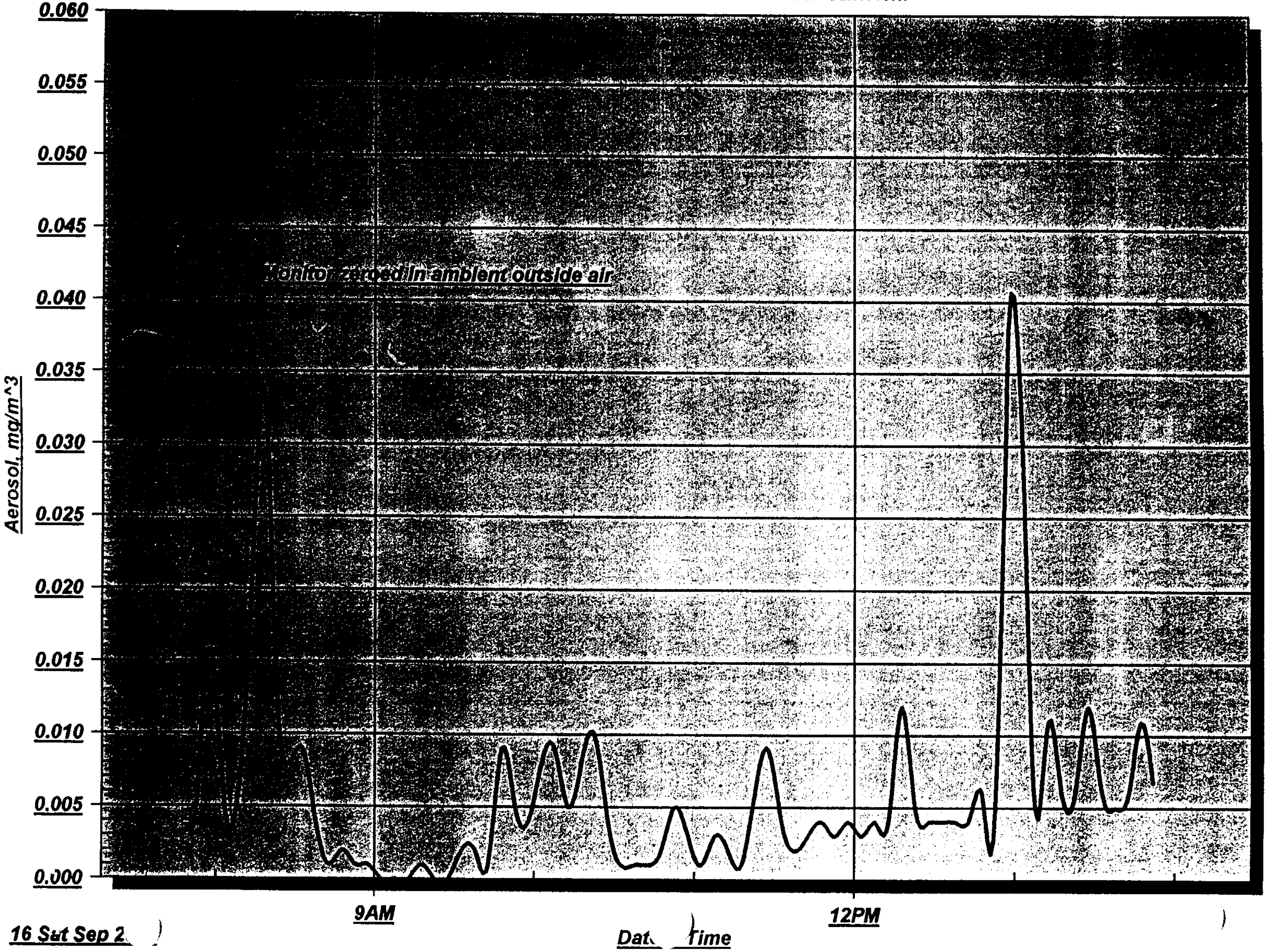
Current Graph: 9-16-00 Pilot D/W

Start time: 07:47:41 09/16/2000 Stop time: 13:52:41 09/16/2000

Legend:	Aerosol
Channel:	Aerosol
(Units)	mg/m^3
Average:	0.006
Lowest point:	0.000
Time	09:02:41
Date	09/16/2000
Highest point:	0.038
Time	12:57:41
Date	09/16/2000
Log interval:	00:05:00
hh:mm:ss	

Maywood Pilot Study

Downwind RMA Perimeter Dust Concentrations >Ambient



AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: Pilot	WEATHER CONDITIONS: Partly cloudy, wind from the South	DATE: 9-18-00
PERSON PERFORMING MONITORING: RMCoblentz		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See HWP 14, 15, 16, & 17			Dust Trak	21762
		N/A		

INSTRUMENTS CALIBRATION YES [X] NO [ ]

PPE IN USE: See HWP

PROCESS: Soil Processing

MONITORING DATA

LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H_2S (ppm)
Stationary Dust Monitoring on North Perimeter Fence adjacent to RMA (see chart)							
N/A							

CONTINUED ON REVERSE SIDE

AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: Soils Aquisition Area	WEATHER CONDITIONS: Partly Cloudy, wind from the south	DATE: 9-18-00

PERSON PERFORMING MONITORING: RMCoblentz

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See HWP 14, 15, 16, & 17			Dust Trak	21760
N/A				

INSTRUMENTS CALIBRATION YES [X] NO [ ]

PPE IN USE: See HWP

PROCESS: Soil excavations

MONITORING DATA

LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H2S (ppm)
Stationary Dust Monitoring on North perimeter fence adjacent to SAA (see chart)							
N/A							

CONTINUED ON REVERSE SIDE

Current Graph: 9-18-00 Soil Aquisition
Start time: 08:01:52 09/18/2000 Stop time: 17:11:52 09/18/2000

Legend:	Aerosol
Channel:	Aerosol
(Units)	mg/m^3
Average:	0.033
Lowest point:	0.024
Time	10:36:52
Date	09/18/2000
Highest point:	0.071
Time	14:46:52
Date	09/18/2000
Log interval:	00:05:00
hh:mm:ss	

AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: Soil Aquisition	WEATHER CONDITIONS: Cloudy, wind out of the north	DATE: 9-19-00
PERSON PERFORMING MONITORING: RMCoblentz		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See HWP 14, 15, 16, & 17			DUST TRAK	21760
		NA		

INSTRUMENTS CALIBRATION YES [X] NO [ ]

PPE IN USE: See HWP

PROCESS: SOIL EXCAVATION

MONITORING DATA

LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H2S (ppm)
STATIONARY monitoring South of RMA boundary (see chart)							
(Note: Monitoring Secured @ 1100 due to Rain)							
NA							

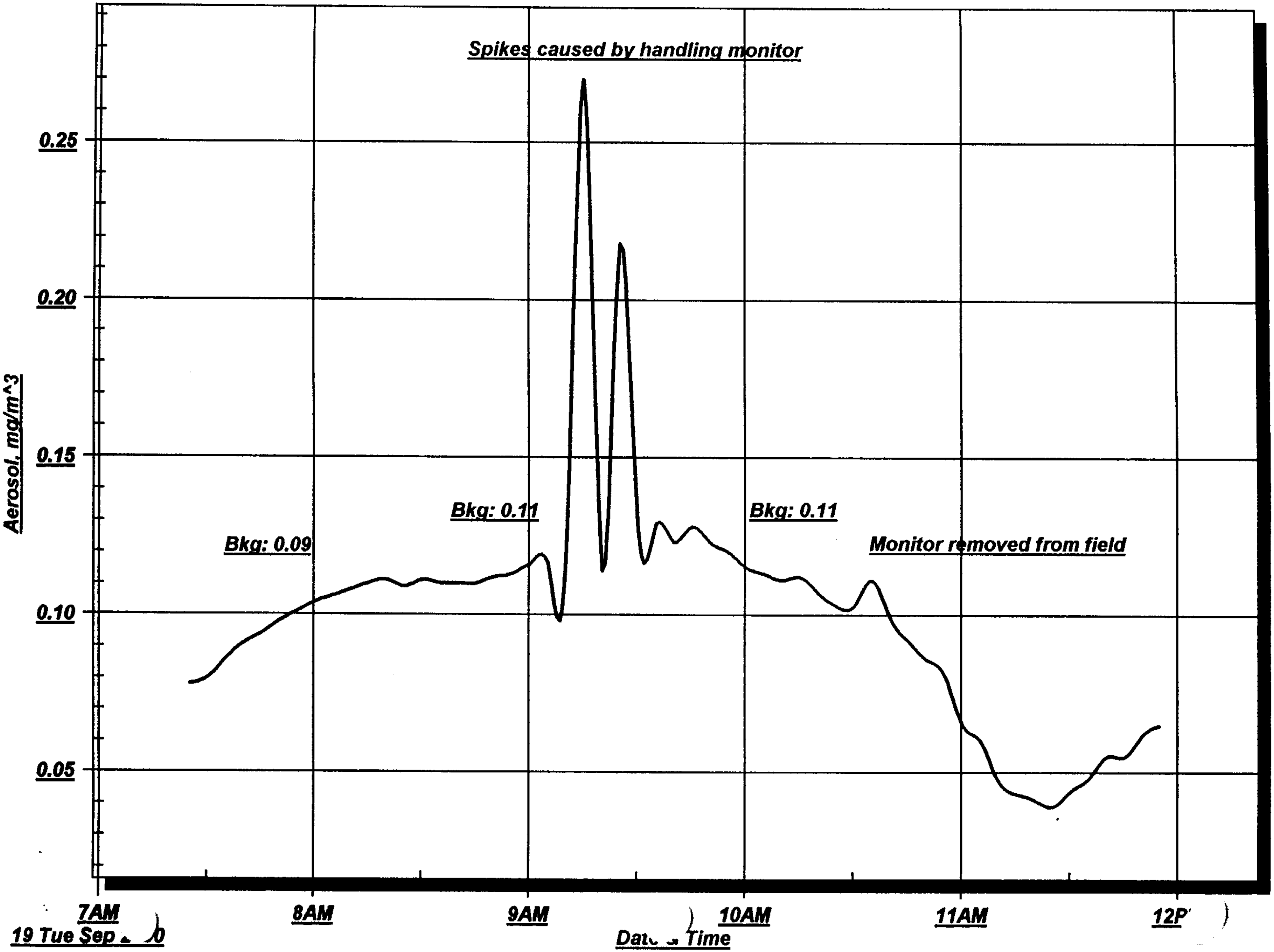
CONTINUED ON REVERSE SIDE

Current Graph: 9-19-00 Soil Aquisition
Start time: 07:20:24 09/19/2000 Stop time: 11:55:24 09/19/2000

Legend:	Aerosol
Channel:	Aerosol
(Units)	mg/m^3
Average:	0.100
Lowest point:	0.039
Time	11:25:24
Date	09/19/2000
Highest point:	0.270
Time	09:15:24
Date	09/19/2000
Log interval:	00:05:00
hh:mm:ss	

Pilot Soils Aquisition Area

Downwind Perimeter Dust Concentrations



AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: PILOT	WEATHER CONDITIONS: Cloudy, wind out of the north	DATE: 9-19-00
PERSON PERFORMING MONITORING: RM Coblentz		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See HWP 14, 15, 16, & 17			DUST TRAK	21762
N/A				

INSTRUMENTS CALIBRATION YES [X] NO [ ]	PPE IN USE: See HWP	PROCESS: Soil Processing

MONITORING DATA

LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H2S (ppm)
STATIONARY Monitoring south of RMA boundary (See Chart)							
(NOTE: Monitoring secured @ due to Rain)							
N/A							

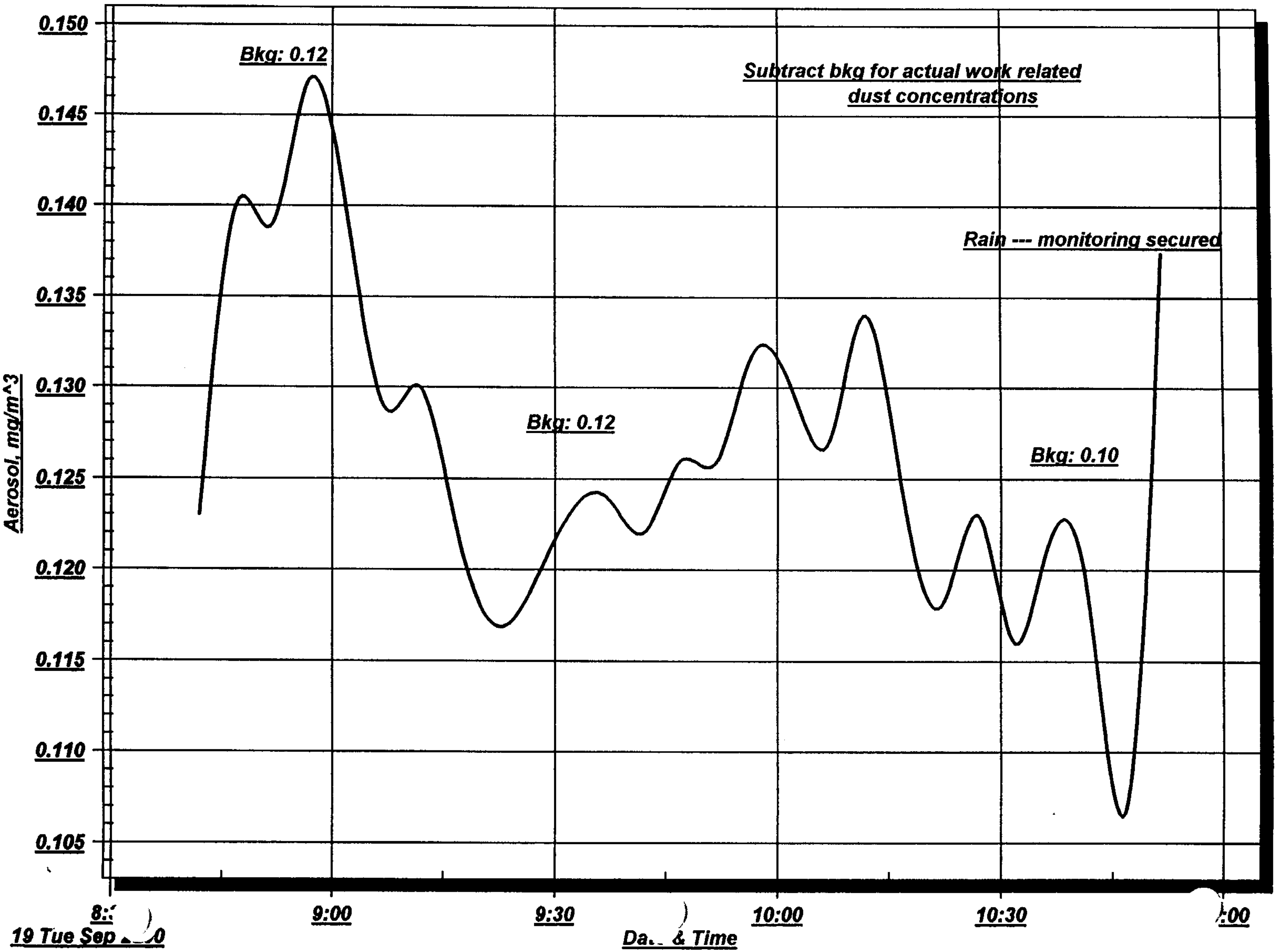
CONTINUED ON REVERSE SIDE

Current Graph: 9-19-00 Pilot
Start time: 08:36:55 09/19/2000   Stop time: 10:51:55 09/19/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	0.127
Lowest point: Time Date	0.107 10:46:55 09/19/2000
Highest point: Time Date	0.147 08:56:55 09/19/2000
Log interval: hh:mm:ss	00:05:00

Maywood Pilot Study

Downwind Perimeter Dust Concentrations



AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: Soils Aquisition	WEATHER CONDITIONS: Clear, wind out of the South	DATE: 9-20-00
PERSON PERFORMING MONITORING: RM Coblentz		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See HWP 14, 15, 16, 17			Dust Trak	21760
N/A			N/A	

INSTRUMENTS CALIBRATION YES [X] NO [ ]

PPE IN USE: See HWP

PROCESS: SOIL EXCAVATION

MONITORING DATA

LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H_2S (ppm)
Stationary dust monitoring on perimeter fence north of RMA (see chart)							
N/A							

CONTINUED ON REVERSE SIDE

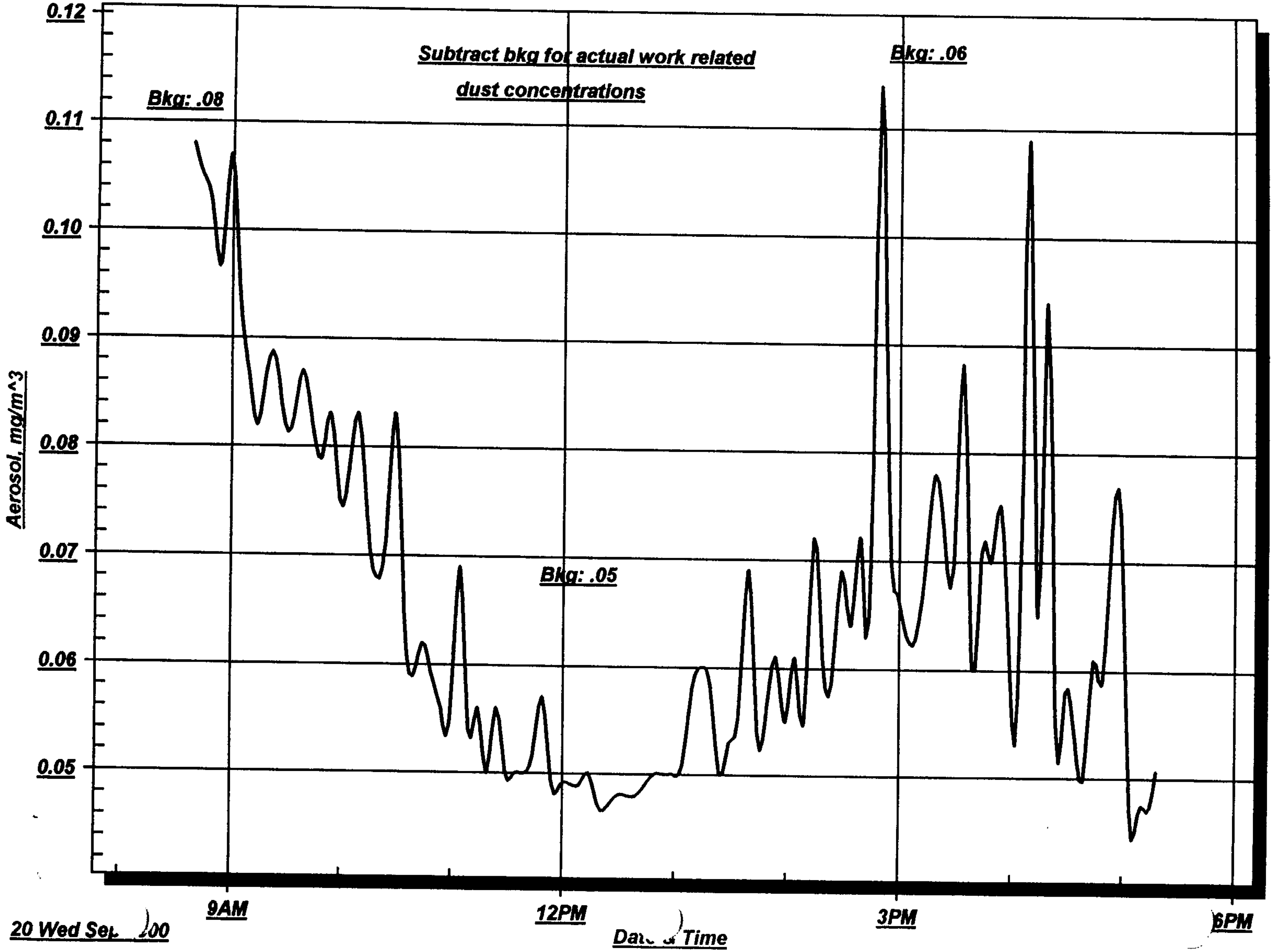
Current Graph: 9-20-00 Soil Aquisition

Start time: 08:33:58 09/20/2000 Stop time: 17:18:58 09/20/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	0.066
Lowest point: Time Date	0.047 12:18:58 09/20/2000
Highest point: Time Date	0.114 14:48:58 09/20/2000
Log interval: hh:mm:ss	00:05:00

Soils Aquisition Area

Downwind Perimeter Dust Concentrations



AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: Pilot	WEATHER CONDITIONS: Clear, wind out of the south	DATE: 9-20-00
PERSON PERFORMING MONITORING: RMCoblentz		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See HWP # 14, 15, 16, & 17			Dust Trak	21762
N/A			Multi-Rae	21810
			N/A	

INSTRUMENTS CALIBRATION YES [X] NO [ ]

PPE IN USE: See HWP

PROCESS: Soil Processing

MONITORING DATA

LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H2S (ppm)
Ditch @ North edge of STEPAN Stockpile	0830	N/A	Ø	20.8	Ø	Ø	Ø
Ditch @ north edge of Stepan Stockpile	1145	N/A	Ø	21.0	Ø	Ø	Ø
Stationary monitoring @ North perimeter Fence adjacent to RMA (See Chart)							
N/A							

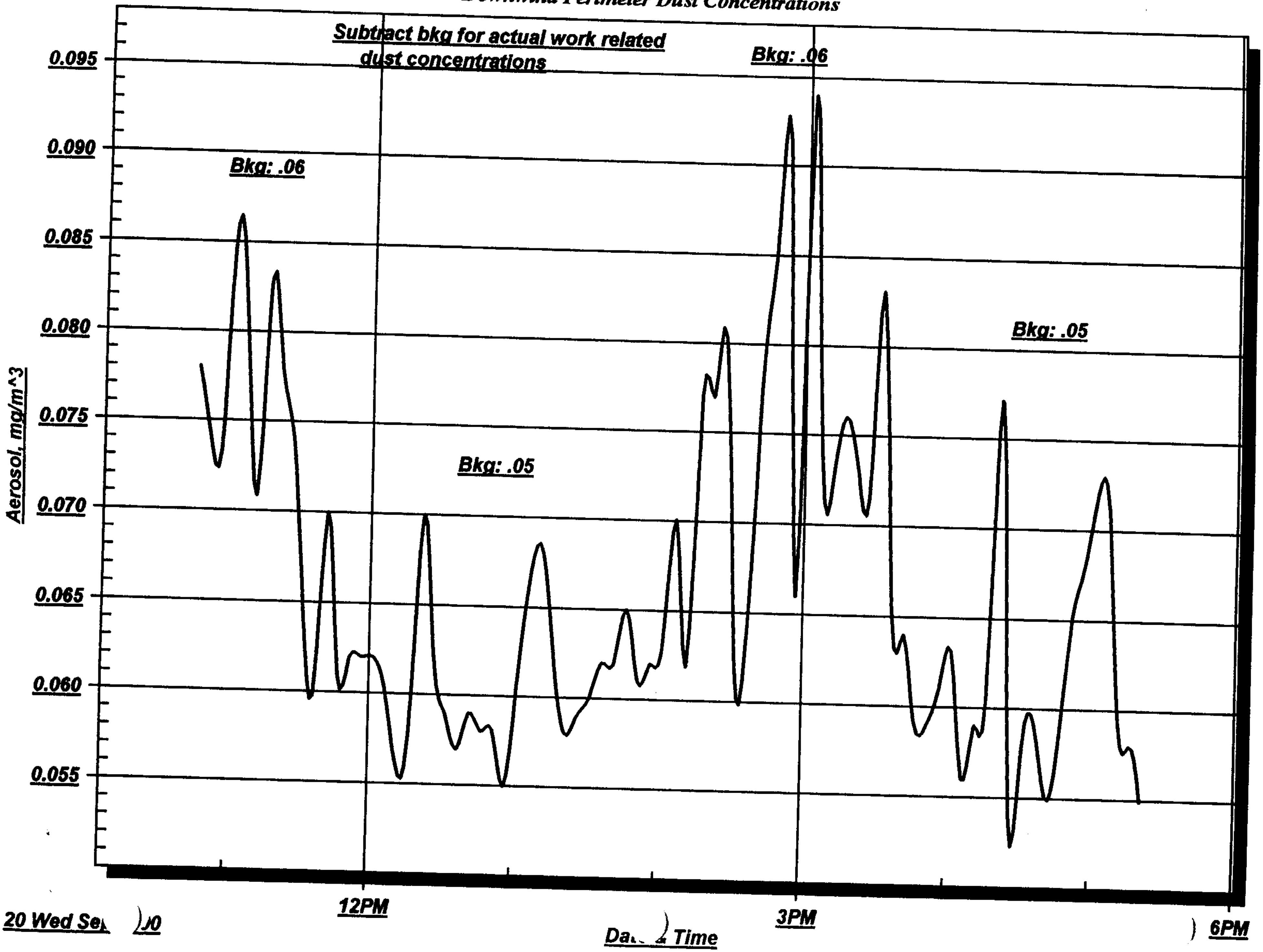
CONTINUED ON REVERSE SIDE

Current Graph: 9-20-00 Pilot
Start time: 10:41:55 09/20/2000 Stop time: 17:21:55 09/20/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	0.066
Lowest point: Time Date	0.054 16:26:55 09/20/2000
Highest point: Time Date	0.094 15:01:55 09/20/2000
Log interval: hh:mm:ss	00:05:00

Maywood Pilot Study

Downwind Perimeter Dust Concentrations



AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: SOIL AQUISITION	WEATHER CONDITIONS: Partly cloudy, wind ~~of~~ are from South	DATE: 9-21-00
PERSON PERFORMING MONITORING:		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See HWP 14, 15, 16, & 17			DUST TRAK	21760
N/A				

INSTRUMENTS CALIBRATION	PPE IN USE:	PROCESS:
YES [X] NO [ ]	See HWP	SOIL EXCAVATION

MONITORING DATA

LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H2S (ppm)
STATIONARY dust monitoring North of RMA boundary (See chart)							
N/A							

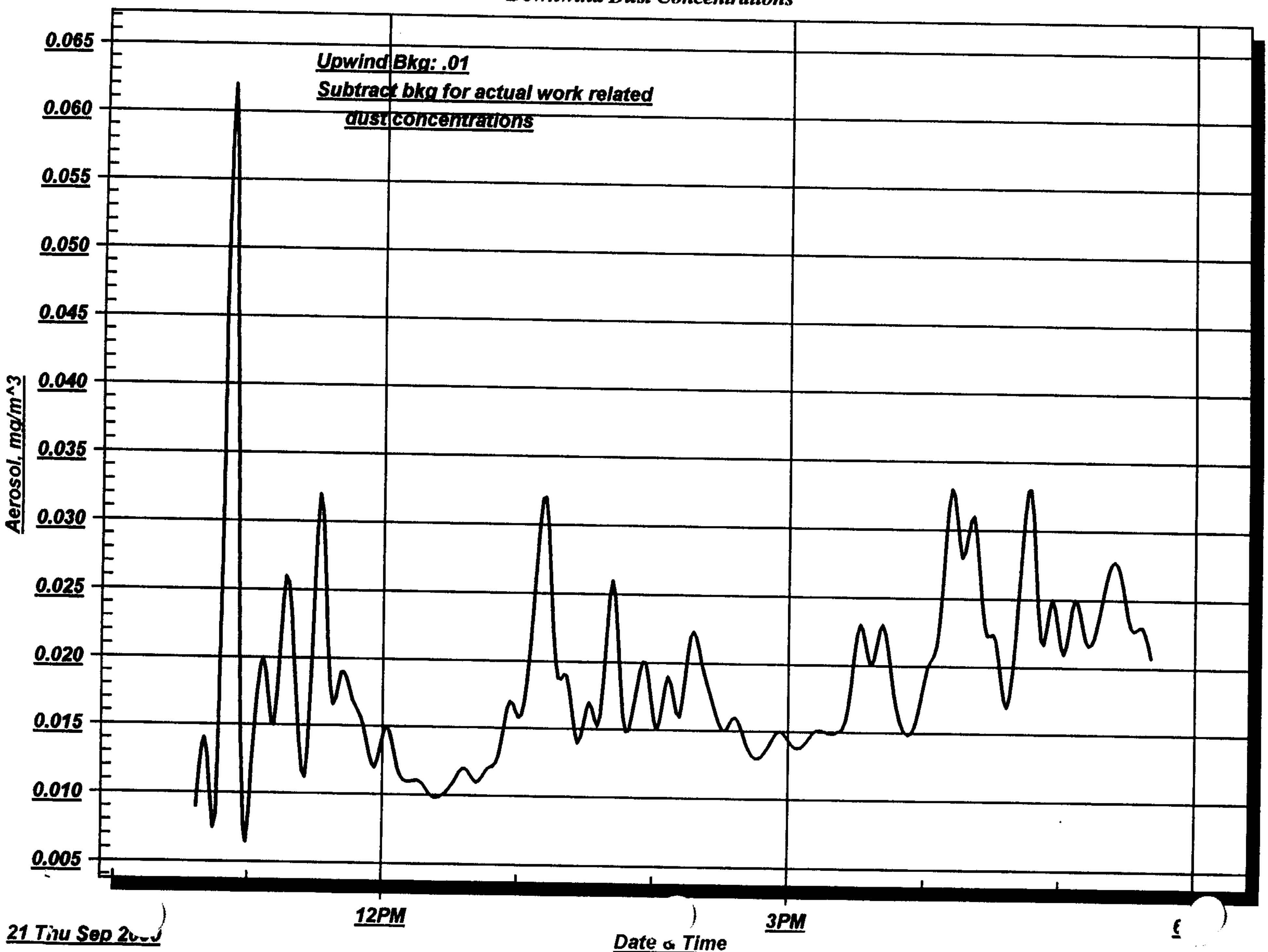
CONTINUED ON REVERSE SIDE

Current Graph: 9-21-00 Soil Aquisition
Start time: 10:31:28 09/21/2000 Stop time: 17:41:28 09/21/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	0.019
Lowest point:	0.009
Time	10:36:28
Date	09/21/2000
Highest point:	0.062
Time	10:51:28
Date	09/21/2000
Log interval: hh:mm:ss	00:05:00

Soils Aquisition Area

Downwind Dust Concentrations



21 Thu Sep 2...

AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: PILOT	WEATHER CONDITIONS: ~~Clear~~ wind from the South Partly cloudy,	DATE: 9-21-00
PERSON PERFORMING MONITORING: RMCoblentz		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See HWP 14, 15, 16, & 17			DUST TRAK	21762
NA				

INSTRUMENTS CALIBRATION	PPE IN USE:	PROCESS:
YES [X] NO [ ]	See HWP	SOIL Processing

MONITORING DATA

LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H2S (ppm)
STATIONARY dust monitoring north of RMA boundary (see chart)							
NA							

CONTINUED ON REVERSE SIDE

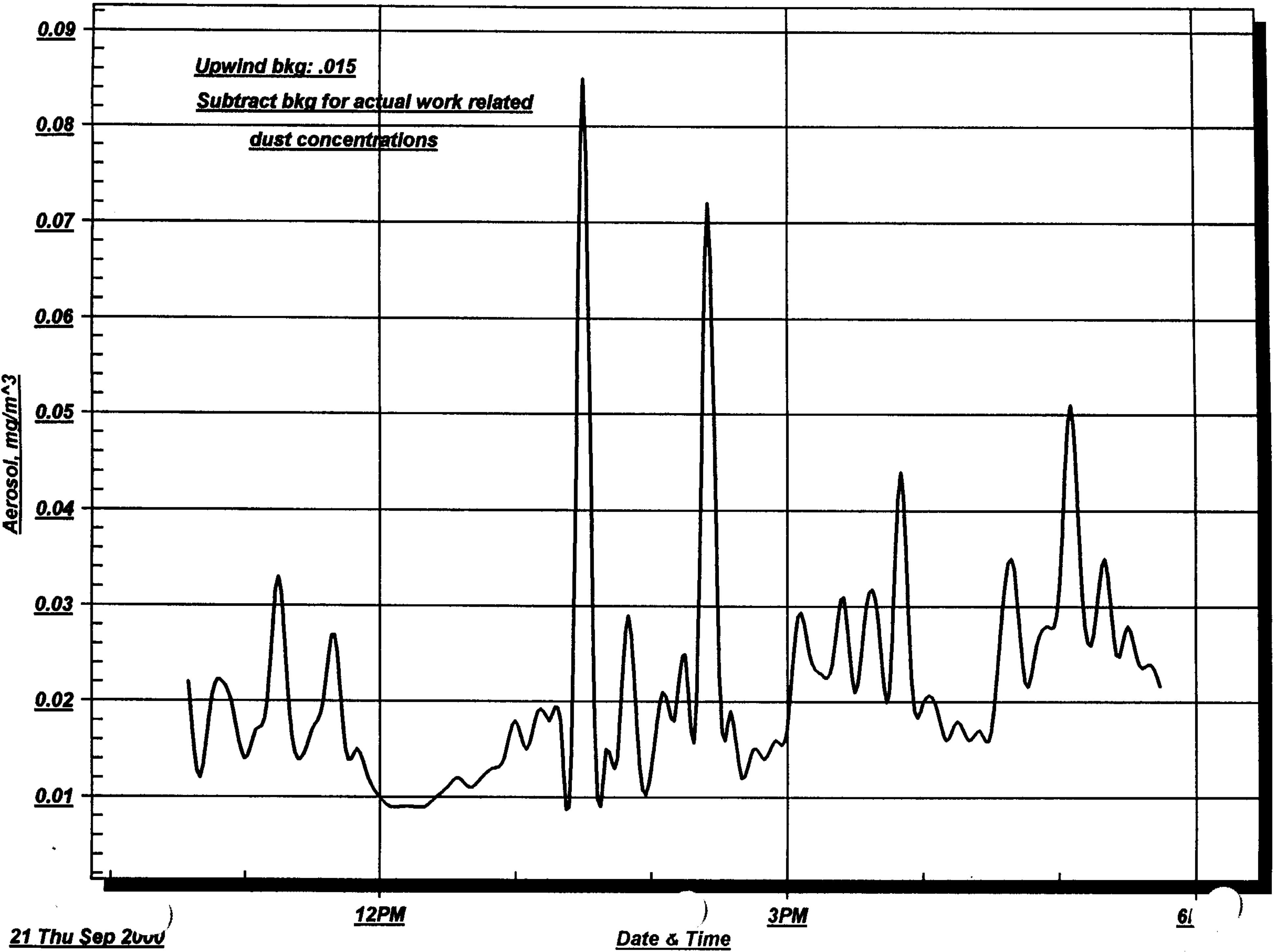
Current Graph: 9-21-00 Pilot

Start time: 10:29:44 09/21/2000 Stop time: 17:44:44 09/21/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	0.022
Lowest point:	0.009
Time	12:04:44
Date	09/21/2000
Highest point:	0.085
Time	13:29:44
Date	09/21/2000
Log interval: hh:mm:ss	00:05:00

Maywood Pilot Study

Downwind Dust Concentrations



AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: PILOT	WEATHER CONDITIONS: Clear, wind out of the West	DATE: 9/22/00
PERSON PERFORMING MONITORING: RMCoblontz		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See HWP # 14, 15, 16, & 17			Dust Trak	21762
N/A				

INSTRUMENTS CALIBRATION YES [X] NO [ ]

PPE IN USE: See HWP

PROCESS: STAGING EQUIPMENT

MONITORING DATA

LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H2S (ppm)
Stationary dust monitoring east of RMA boundary (see chart)							
N/A							

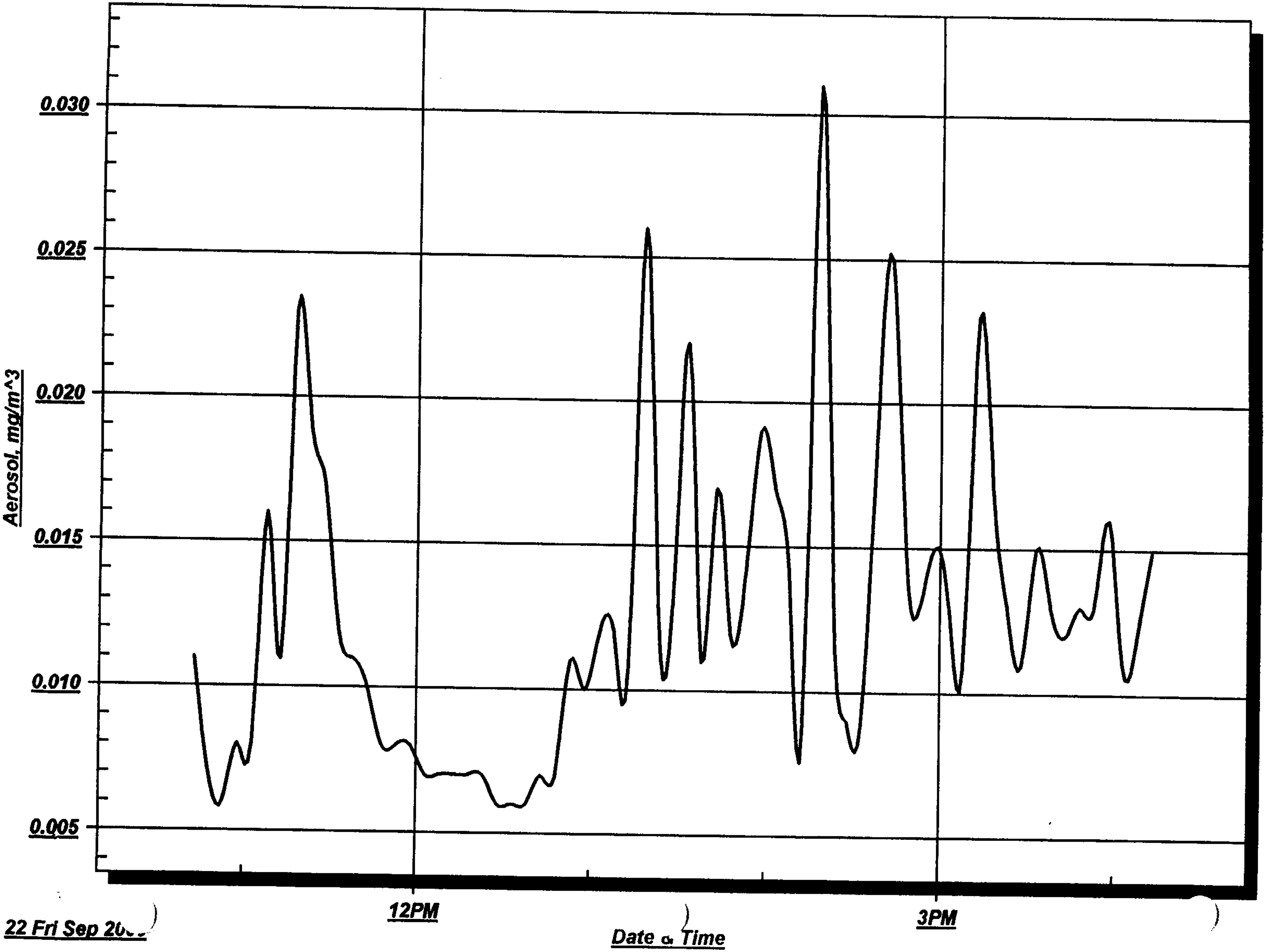
CONTINUED ON REVERSE SIDE

Current Graph: 9-22-00 PIlot
Start time: 10:37:57 09/22/2000 Stop time: 16:12:57 09/22/2000

Legend:	Aerosol
Channel:	Aerosol
(Units)	mg/m^3
Average:	0.013
Lowest point:	0.006
Time	10:52:57
Date	09/22/2000
Highest point:	0.031
Time	14:17:57
Date	09/22/2000
Log interval:	00:05:00
hh:mm:ss	

Maywood Pilot Study

Downwind Dust Concentrations



AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: Soil Aquisition	WEATHER CONDITIONS: Clear, wind from the west	DATE: 9-22-00
PERSON PERFORMING MONITORING: RMCoblentz		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See HWP # 14, 15, 16, & 17			Dust Trak	21760
N/A				

INSTRUMENTS CALIBRATION	PPE IN USE:	PROCESS:
YES [X] NO [ ]	See HWP	Soil excavation

MONITORING DATA

LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H_2S (ppm)
Stationary Dust monitoring east of RMA boundary (see chart)							
N/A							

CONTINUED ON REVERSE SIDE

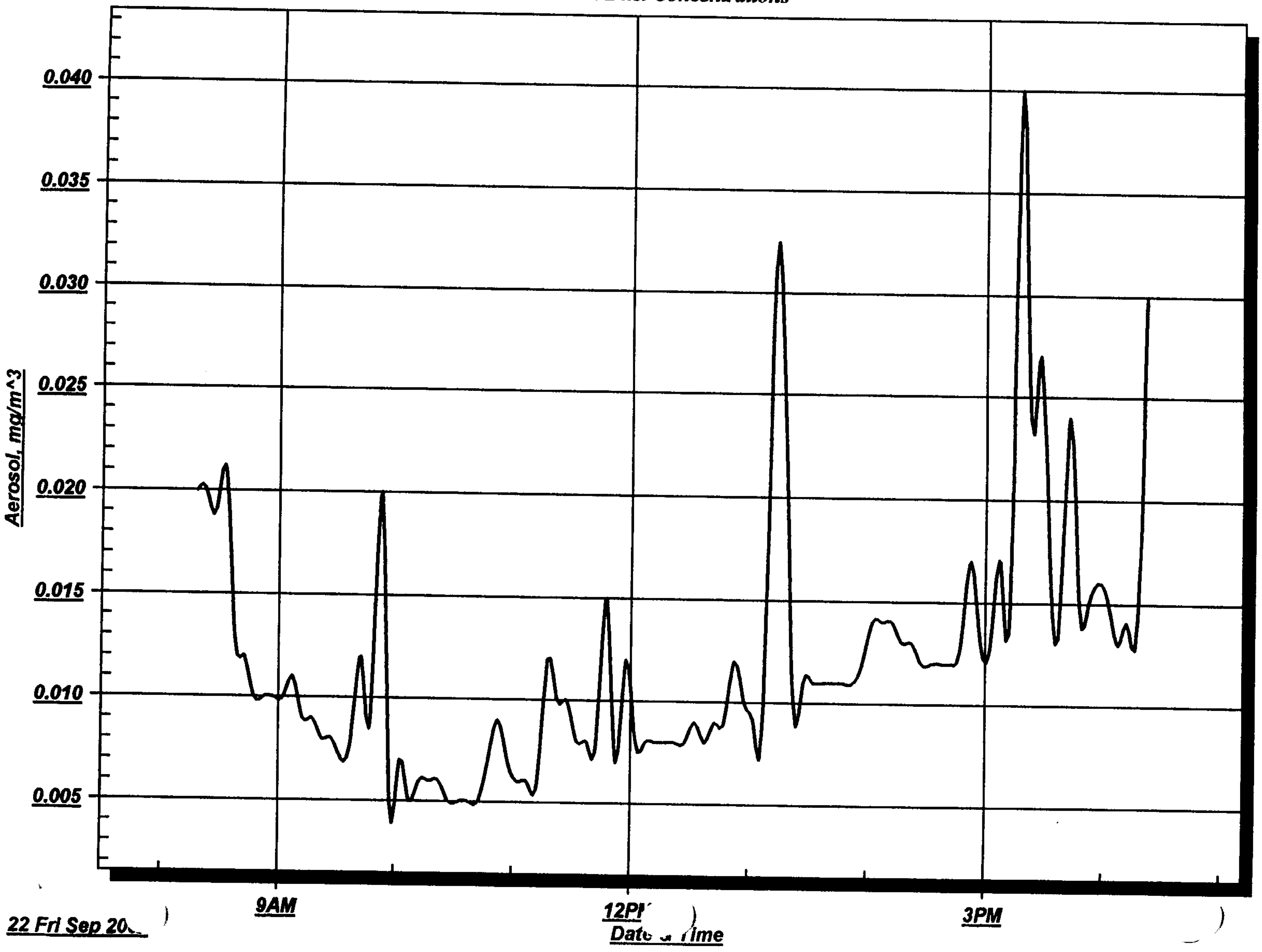
FUSRAP S-023 (09/22/94)

Current Graph: 9-22-00 Soil Aquisition
Start time: 08:12:31 09/22/2000 Stop time: 16:22:31 09/22/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	0.012
Lowest point: Time Date	0.005 09:57:31 09/22/2000
Highest point: Time Date	0.040 15:17:31 09/22/2000
Log interval: hh:mm:ss	00:05:00

Soils Aquisition Area

Downwind Dust Concentrations



AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: Soil Aquisition	WEATHER CONDITIONS: Clear, Wind from the north	DATE: 9/27/00
PERSON PERFORMING MONITORING: RMCoblentz		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See HWP #14, 15	16, & 17		Dust Trak	21760
N/A			N/A	

INSTRUMENTS CALIBRATION YES [X] NO [ ]

PPE IN USE: See HWP

PROCESS:

MONITORING DATA

LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H2S (ppm)
Stationary dust monitoring south side of	RMA	(see	chart)				
N/A							

CONTINUED ON REVERSE SIDE

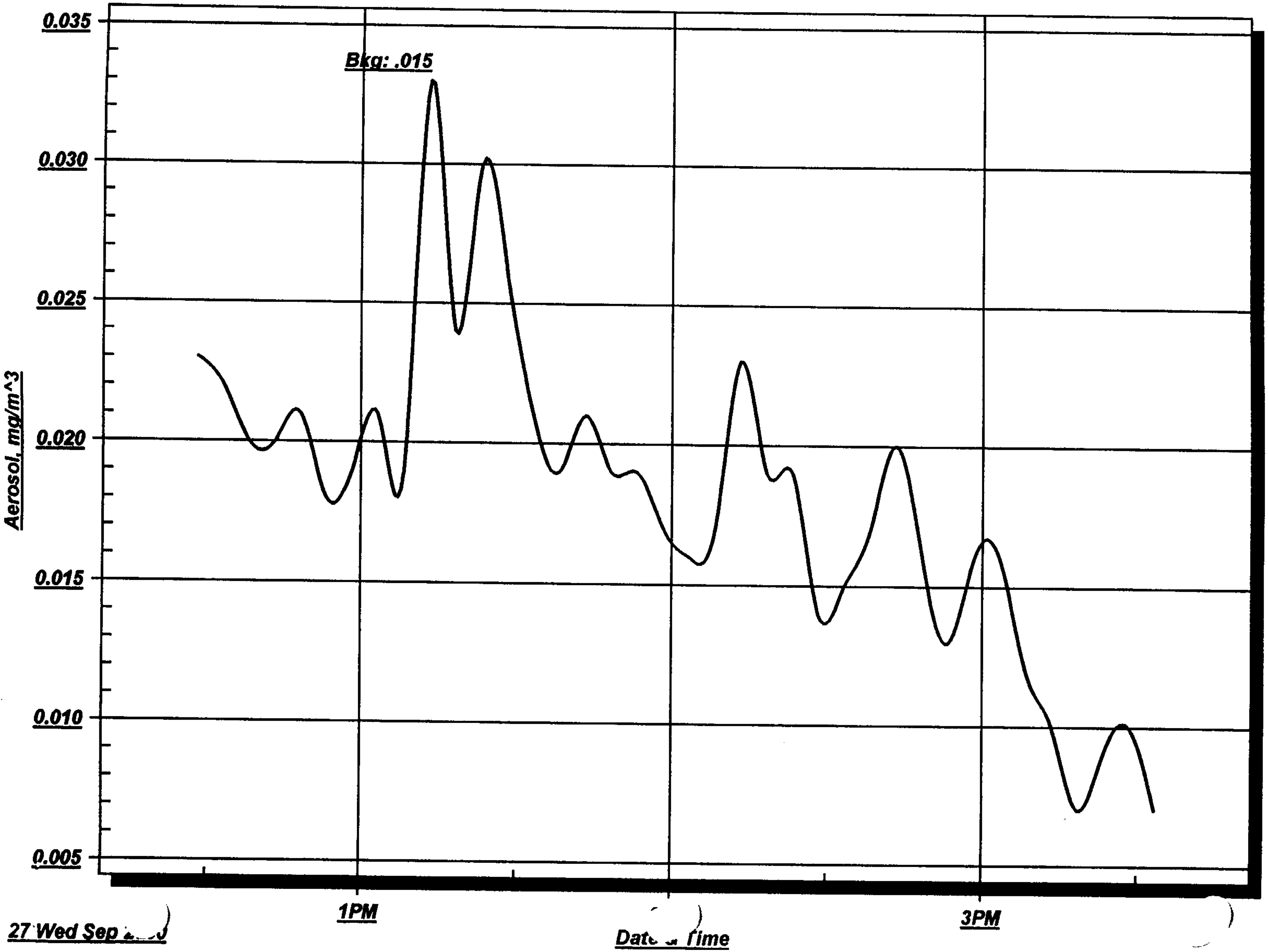
FUSRAP S-023 (09/22/94)

Current Graph: 9-27-00 Soil Aquisition

Start time: 12:23:16 09/27/2000 Stop time: 15:33:16 09/27/2000

Legend:	Aerosol
Channel:	Aerosol
(Units)	mg/m^3
Average:	0.018
Lowest point:	0.007
Time	15:18:16
Date	09/27/2000
Highest point:	0.033
Time	13:13:16
Date	09/27/2000
Log interval:	00:05:00
hh:mm:ss	

Soils Aquisition Area



AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: PILOT	WEATHER CONDITIONS: Clear, Wind from the north	DATE: 9-27-00	
PERSON PERFORMING MONITORING: RM Coblentz			

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See HWP # 14, 15, 16, & 17			DUST TRAK	
			DUST TRAK	
N/A				

INSTRUMENTS CALIBRATION YES [X] NO [ ]	PPE IN USE: See HWP	PROCESS: SOIL PROCESSING

MONITORING DATA

LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H2S (ppm)
STATIONARY DUST monitoring in Whitney plant work area (See chart)							
STATIONARY DUST monitoring south of RMA boundary (See Chart)							
N/A							

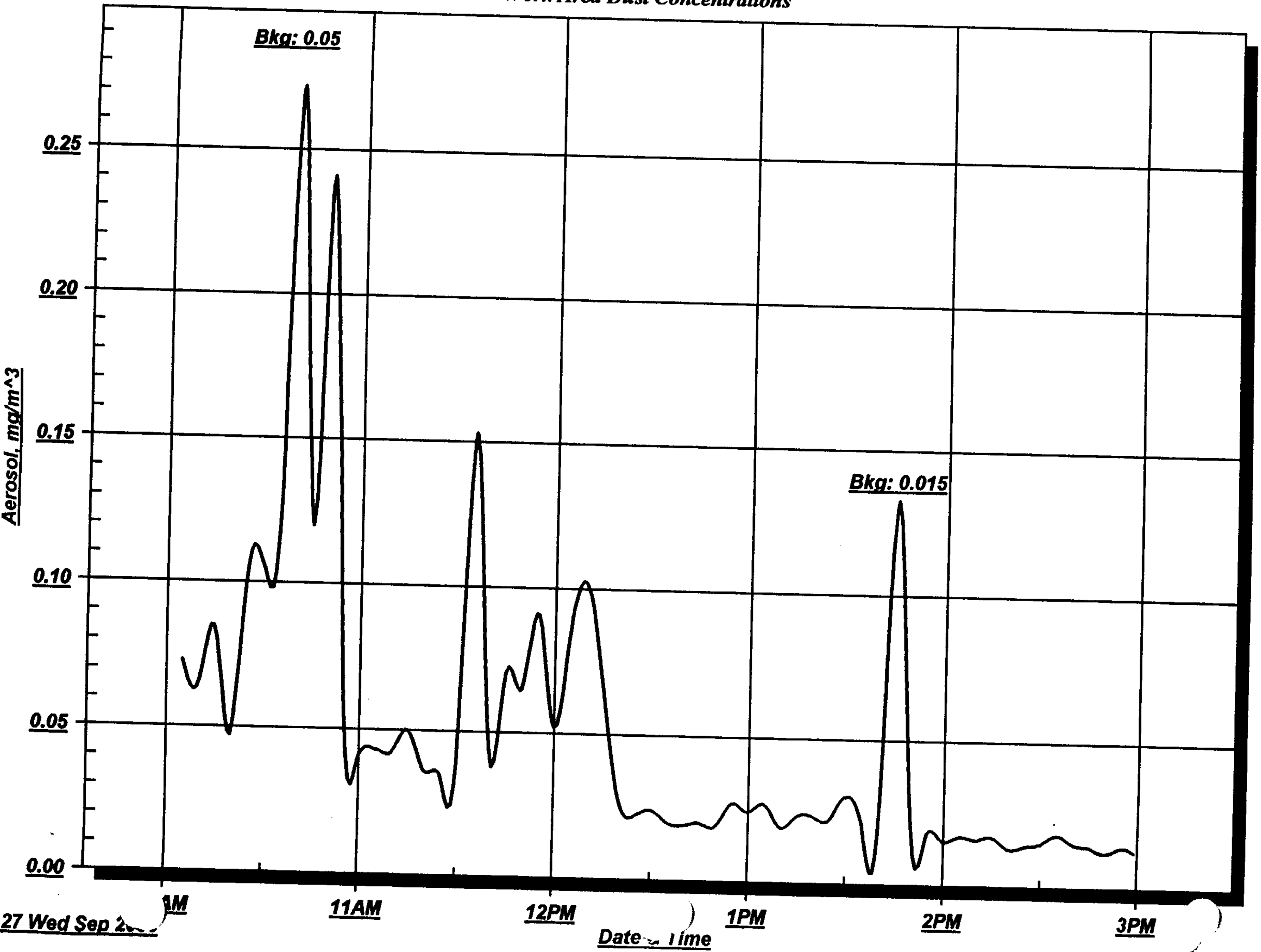
CONTINUED ON REVERSE SIDE

Current Graph: 9-27-00 Pilot Work Area
Start time: 09:59:51 09/27/2000 Stop time: 14:59:51 09/27/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	0.051
Lowest point:	0.012
Time	14:49:51
Date	09/27/2000
Highest point:	0.272
Time	10:39:51
Date	09/27/2000
Log interval: hh:mm:ss	00:05:00

Maywood Pilot Study

Work Area Dust Concentrations

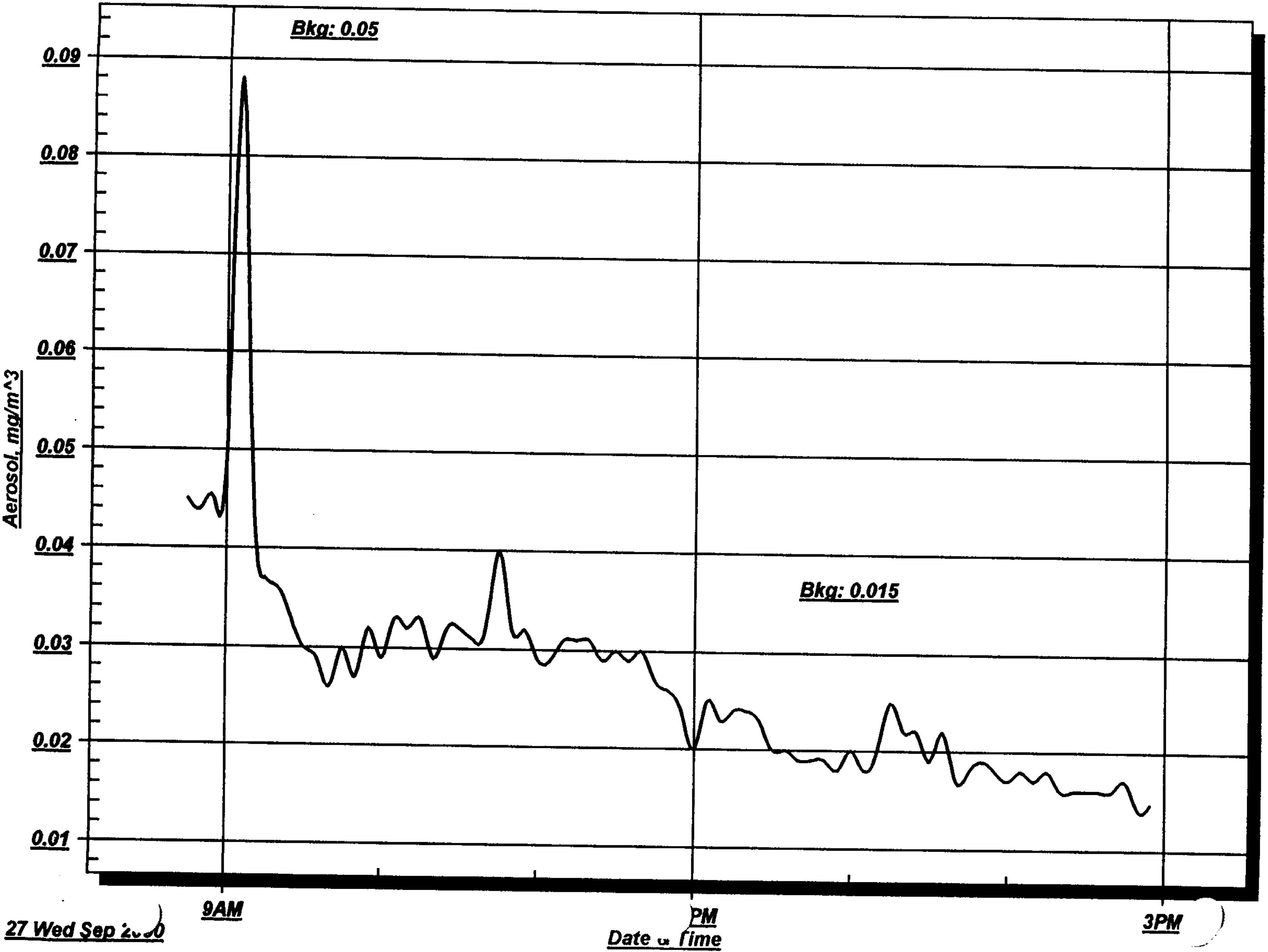


Current Graph: 9-27-00 Pilot Downwind
Start time: 08:39:56 09/27/2000 Stop time: 14:54:56 09/27/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	0.027
Lowest point: Time Date	0.014 14:49:56 09/27/2000
Highest point: Time Date	0.088 09:04:56 09/27/2000
Log interval: hh:mm:ss	00:05:00

Maywood Pilot Study

Downwind Dust Concentrations



AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: Soil Aquisition	WEATHER CONDITIONS: Partly Cloudy Random winds	DATE: 9-28-00
PERSON PERFORMING MONITORING: RM Coblentz		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	INSTRUMENT INFORMATION SERIAL NO.
See HWP 14, 15, 16, & 17			Dust Trak	21760
NA			NA	

INSTRUMENTS CALIBRATION YES [ ] NO [ ]	PPE IN USE:	PROCESS:

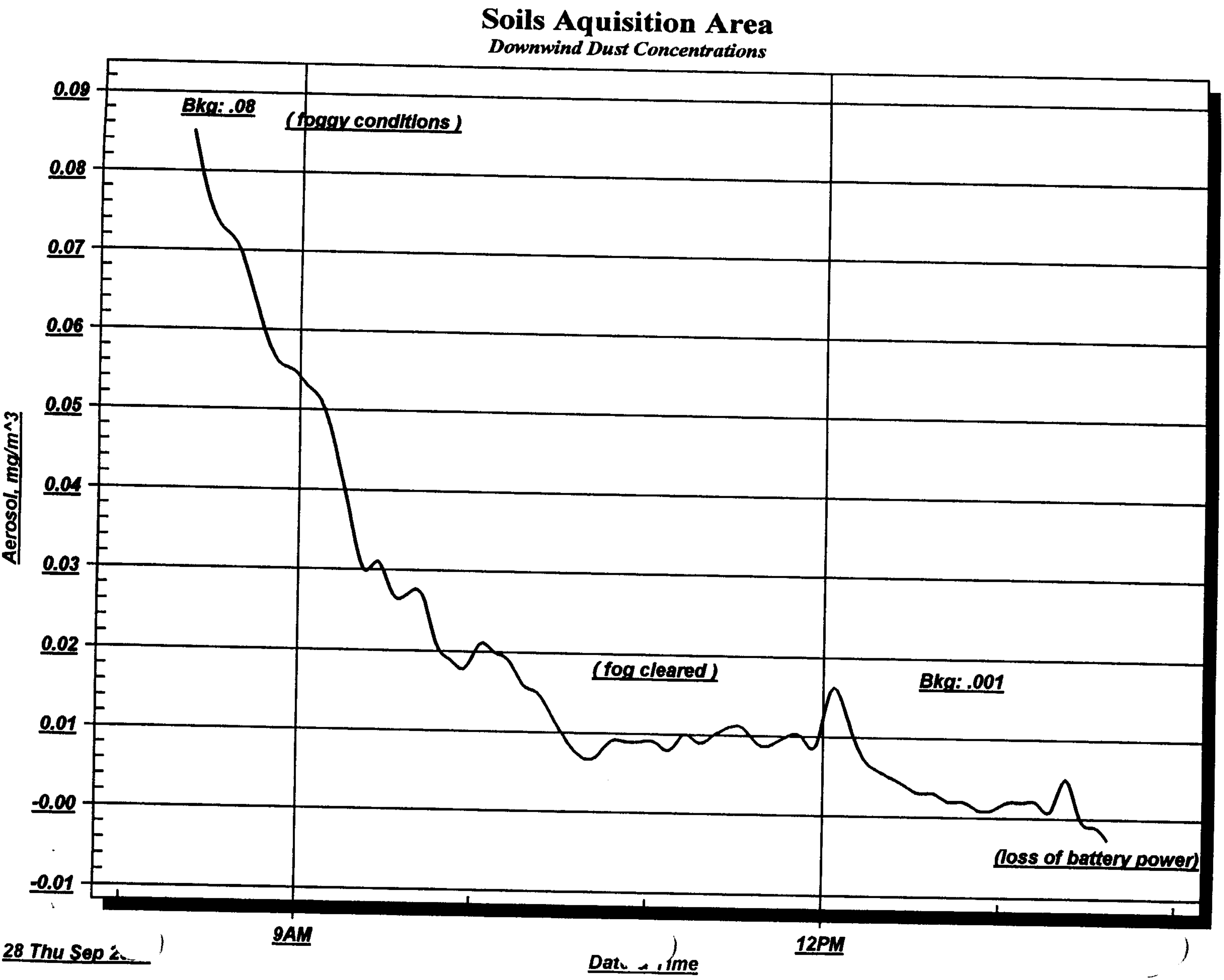
MONITORING DATA

LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H2S (ppm)
Stationary dust monitoring on perimeter fence adjacent to RMA boundary North (see attached graph)							
NA							

CONTINUED ON REVERSE SIDE

Current Graph: 9-28-00 Soil Aquisition
Start time: 08:17:36 09/28/2000 Stop time: 13:37:36 09/28/2000

Legend:	Aerosol
Channel:	Aerosol
(Units)	mg/m^3
Average:	0.020
Lowest point:	-0.003
Time	13:37:36
Date	09/28/2000
Highest point:	0.085
Time	08:22:36
Date	09/28/2000
Log interval:	00:05:00
hh:mm:ss	



Soils Aquisition Area
Downwind Dust Concentrations
Bkg: .08
(foggy conditions)
(fog cleared)
Bkg: .001
(loss of battery power)
Aerosol, mg/m^3
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
-0.00
-0.01
9AM
12PM

AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: PILOT	WEATHER CONDITIONS: Partly Cloudy, wind from the north	DATE: 9/29/00
PERSON PERFORMING MONITORING: RM Coblentz		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See HWP 14, 15, 16, & 17			DUST TRAK	21762
			DUST TRAK	21763
N/A			N/A	

INSTRUMENTS CALIBRATION YES [X] NO [ ]	PPE IN USE: See HWP	PROCESS: SOIL PROCESSING Rinse Plant Testing

MONITORING DATA

LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H2S (ppm)
Stationary dust monitoring downwind (south of RMA boundary) see chart							
Work area monitoring (monitor hanging on excavator door until ~1530 hrs.)							
Ambulatory monitoring for dust during operation of 1st Rinse plant after 1530 hrs							
N/A							

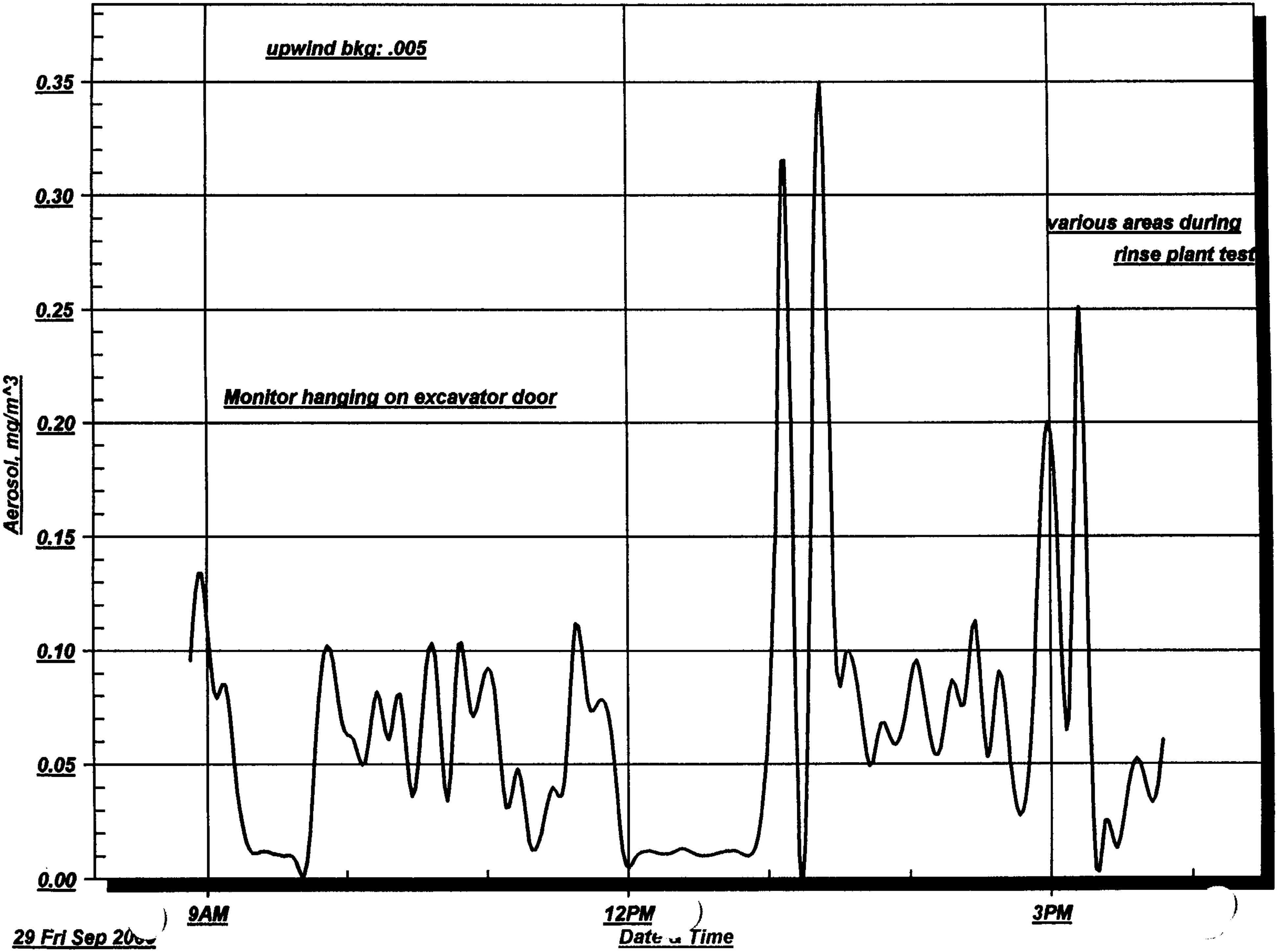
CONTINUED ON REVERSE SIDE

Current Graph: 9-29-00 Pilot Work Area
Start time: 08:47:43 09/29/2000 Stop time: 15:47:43 09/29/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	0.067
Lowest point: Time Date	0.008 09:37:43 09/29/2000
Highest point: Time Date	0.350 13:22:43 09/29/2000
Log interval: hh:mm:ss	00:05:00

Maywood Pilot Study

Work Area Dust Concentrations

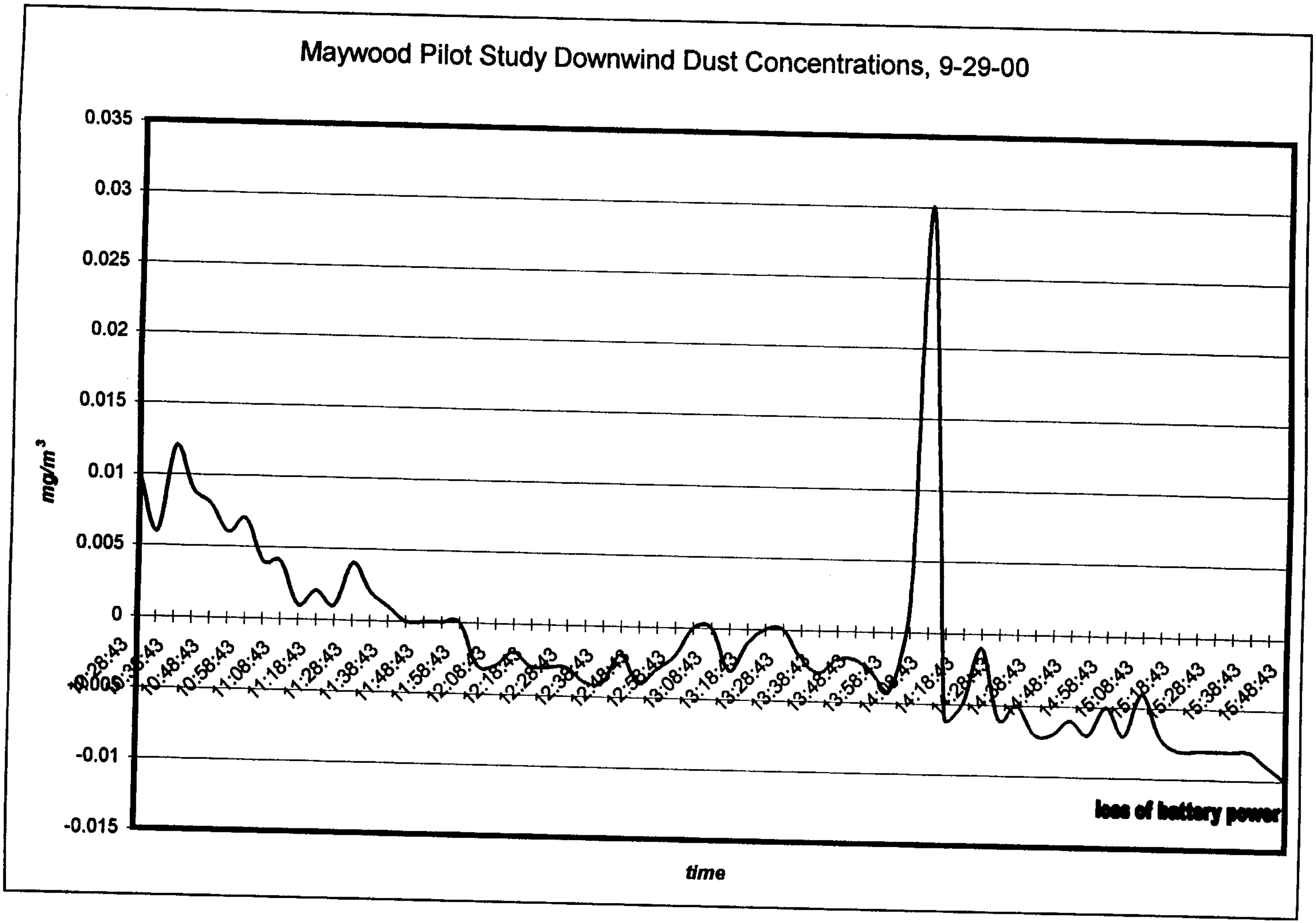


Pilot Downwind Dust Monitoring Summary

Model:	Dust Trak
Serial Number:	22007
Test ID:	1
Test Abbreviation:	
Start Date:	9/29/00
Start Time:	10:23:43
Duration (dd:hh:mm:ss):	-11501:-4:-29:-27
Time constant (seconds):	10
Log Interval (mm:ss):	5:00
Number of points:	66
Notes:	

Statistics	Channel:	Aerosol
	Units:	mg/m^3
	Average:	0
	Minimum:	-24.999
	Time of Minimum:	15:53:43
	Date of Minimum:	9/29/00
	Maximum:	0.03
	Time of Maximum:	14:08:43
	Date of Maximum:	9/29/00
Calibration	Sensor:	Aerosol
	Cal. date	9/23/99

Loss of battery power caused false data point of -24.999. Ommitted from graph.



Maywood Pilot Study Downwind Dust Concentrations, 9-29-00
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
-0.005
-0.01
-0.015
mg/m3
10:28:43
10:38:43
10:48:43
10:58:43
11:08:43
11:18:43
11:28:43
11:38:43
11:48:43
11:58:43
12:08:43
12:18:43
12:28:43
12:38:43
12:48:43
12:58:43
13:08:43
13:18:43
13:28:43
13:38:43
13:48:43
13:58:43
14:08:43
14:18:43
14:28:43
14:38:43
14:48:43
14:58:43
15:08:43
15:18:43
15:28:43
15:38:43
15:48:43
loss of battery power
time

AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: PILOT	WEATHER CONDITIONS: Partly cloudy wind from the EAST		DATE: 10/2/00	
PERSON PERFORMING MONITORING: RMCoblentz				

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See HWP # 14, 15, 16, & 17			DUST TRAK	21762
N/A			N/A	

INSTRUMENTS CALIBRATION YES [X] NO [ ]	PPE IN USE: See HWP	PROCESS: SOIL Processing

MONITORING DATA

LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H2S (ppm)
Stationary dust monitoring west of RMA (see chart)							
N/A							

CONTINUED ON REVERSE SIDE

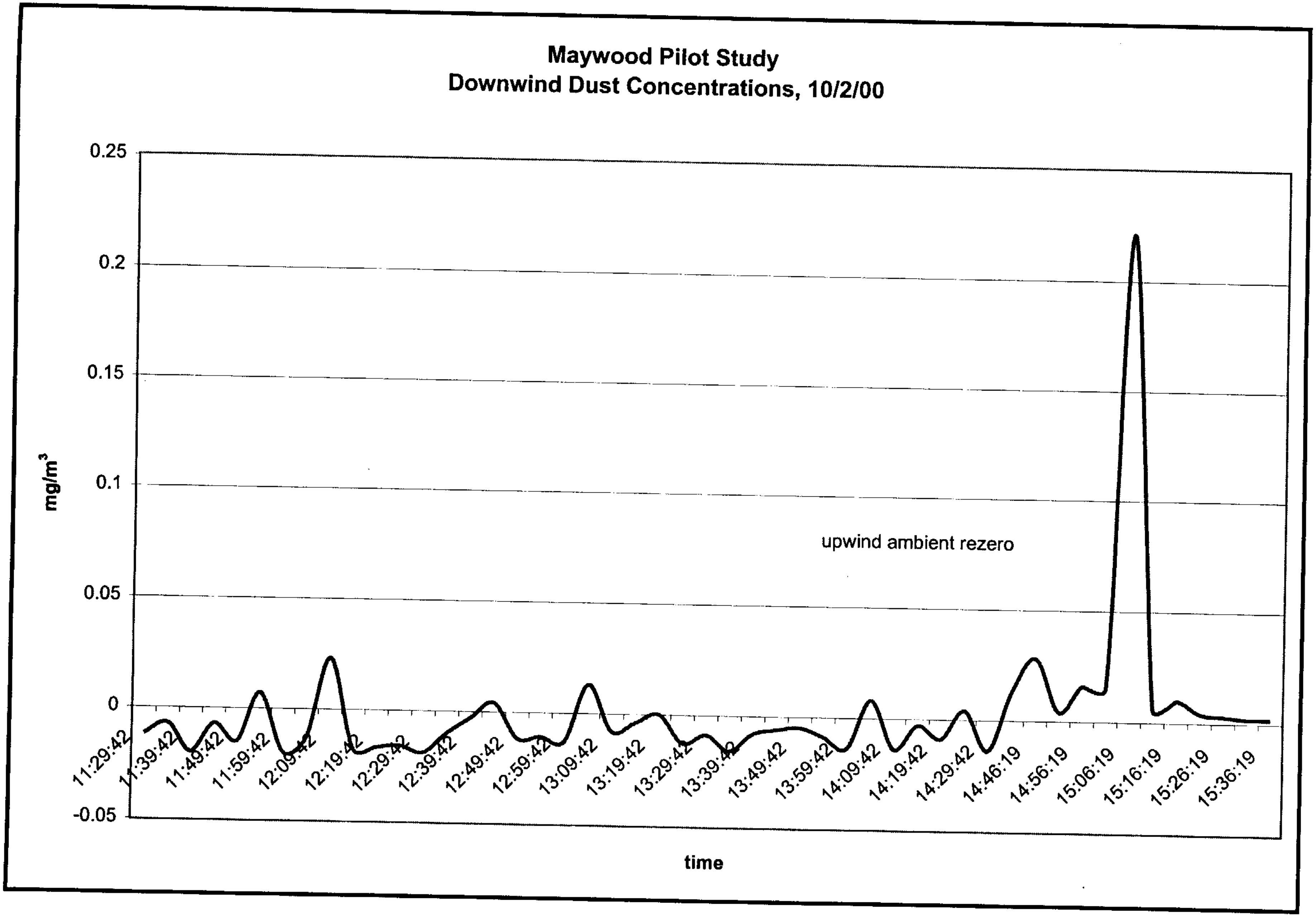
Maywood Pilot Plant Dust Monitoring Summary

10/02/2000

Model:	Dust Trak		
Serial Number:	22007		
Test ID:	Pilot Down Wind Part 1		
Test Abbreviation:			
Start Date:	10/02/2000		
Start Time:	11:24:42		
Duration (dd:hh:mm:ss):	00:03:05:00		
Time constant (seconds):	10		
Log Interval (mm:ss):	5:00		
Number of points:	37		
Notes:			
Statistics	Channel:	Aerosol	
	Units:	mg/m^3	
	Average:		-0.008
	Minimum:		-0.02
	Time of Minimum:		11:39:42
	Date of Minimum:		10/02/2000
	Maximum:		0.023
	Time of Maximum:		12:09:42
	Date of Maximum:		10/02/2000
Calibration	Sensor:	Aerosol	
	Cal. date		09/23/1999

Model:	Dust Trak		
Serial Number:	22007		
Test ID:	Pilot Down Wind Part 2		
Test Abbreviation:			
Start Date:	10/02/2000		
Start Time:	14:36:19		
Duration (dd:hh:mm:ss):	00:01:00:00		
Time constant (seconds):	10		
Log Interval (mm:ss):	5:00		
Number of points:	12		
Notes:			
Statistics	Channel:	Aerosol	
	Units:	mg/m^3	
	Average:		0.027
	Minimum:		0.002
	Time of Minimum:		15:31:19
	Date of Minimum:		10/02/2000
	Maximum:		0.221
	Time of Maximum:		15:06:19
	Date of Maximum:		10/02/2000
Calibration	Sensor:	Aerosol	
	Cal. date		09/23/1999

Monitor zeroed in upwind ambient air



Maywood Pilot Study
Downwind Dust Concentrations, 10/2/00
0.25
0.2
0.15
0.1
0.05
0
-0.05
mg/m3
upwind ambient rezero
11:29:42
11:39:42
11:49:42
11:59:42
12:09:42
12:19:42
12:29:42
12:39:42
12:49:42
12:59:42
13:09:42
13:19:42
13:29:42
13:39:42
13:49:42
13:59:42
14:09:42
14:19:42
14:29:42
14:46:19
14:56:19
15:06:19
15:16:19
15:26:19
15:36:19
time

AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: PILOT	WEATHER CONDITIONS: Clear wind from the northeast	DATE: 10/3/00
PERSON PERFORMING MONITORING: RMCoblentz		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
See HWP 14, 15, 16, & 17			DUST TRAK	21760
N/A				

INSTRUMENTS CALIBRATION	PPE IN USE:	PROCESS:
YES [X] NO [ ]	See HWP	SOIL Processing

MONITORING DATA

LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H2S (ppm)
Stationary dust monitoring south west of RMA boundary (see graph data)							
N/A							

CONTINUED ON REVERSE SIDE

Pilot Downwind Dust Monitoring Summary, 10/3/2000

Model:	Dust Trak		
Serial Number:	22008		
Test ID:	Pilot D/W Part 1		
Test Abbreviation:			
Start Date:	10/03/2000		
Start Time:	8:20:13		
Duration (dd:hh:mm:ss):	00:01:45:00		
Time constant (seconds):	10		
Log Interval (mm:ss):	5:00		
Number of points:	21		
Notes:			
Statistics	Channel:	Aerosol	
	Units:	mg/m^3	
	Average:	-0.03	
	Minimum:	-0.082	
	Time of Minimum:	10:05:13	
	Date of Minimum:	10/03/2000	
	Maximum:	0.012	
	Time of Maximum:	8:25:13	
	Date of Maximum:	10/03/2000	
Calibration	Sensor:	Aerosol	
	Cal. date	09/23/1999	

Model:	Dust Trak		
Serial Number:	22008		
Test ID:	Pilot D/W Part 2		
Test Abbreviation:			
Start Date:	10/03/2000		
Start Time:	10:12:01		
Duration (dd:hh:mm:ss):	00:05:15:00		
Time constant (seconds):	10		
Log Interval (mm:ss):	5:00		
Number of points:	63		
Notes:			
Statistics	Channel:	Aerosol	
	Units:	mg/m^3	
	Average:	-0.005	
	Minimum:	-0.016	
	Time of Minimum:	13:47:01	
	Date of Minimum:	10/03/2000	
	Maximum:	0.016	
	Time of Maximum:	11:22:01	
	Date of Maximum:	10/03/2000	
Calibration	Sensor:	Aerosol	
	Cal. date	09/23/1999	

Monitor zeroed in upwind ambient air.

AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: FMSS PILOT PLANT	WEATHER CONDITIONS: PARTLY CLOUDY - EAST WIND	DATE: 10/4/00

PERSON PERFORMING MONITORING: B. COBLENTZ

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION	
			TYPE	SERIAL NO.
SEE HWP 14,			DUSTRACK	21760
15, 16, 17				

INSTRUMENTS CALIBRATION YES [✓] NO [ ]

PPE IN USE: SEE HWP

PROCESS: SOIL SORT

MONITORING DATA

LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H2S (ppm)
STATIONARY DUST MONITORING	SEE ATTACHED DATA GRAPH.						
@ WEST OF RMA BOUNDARY							

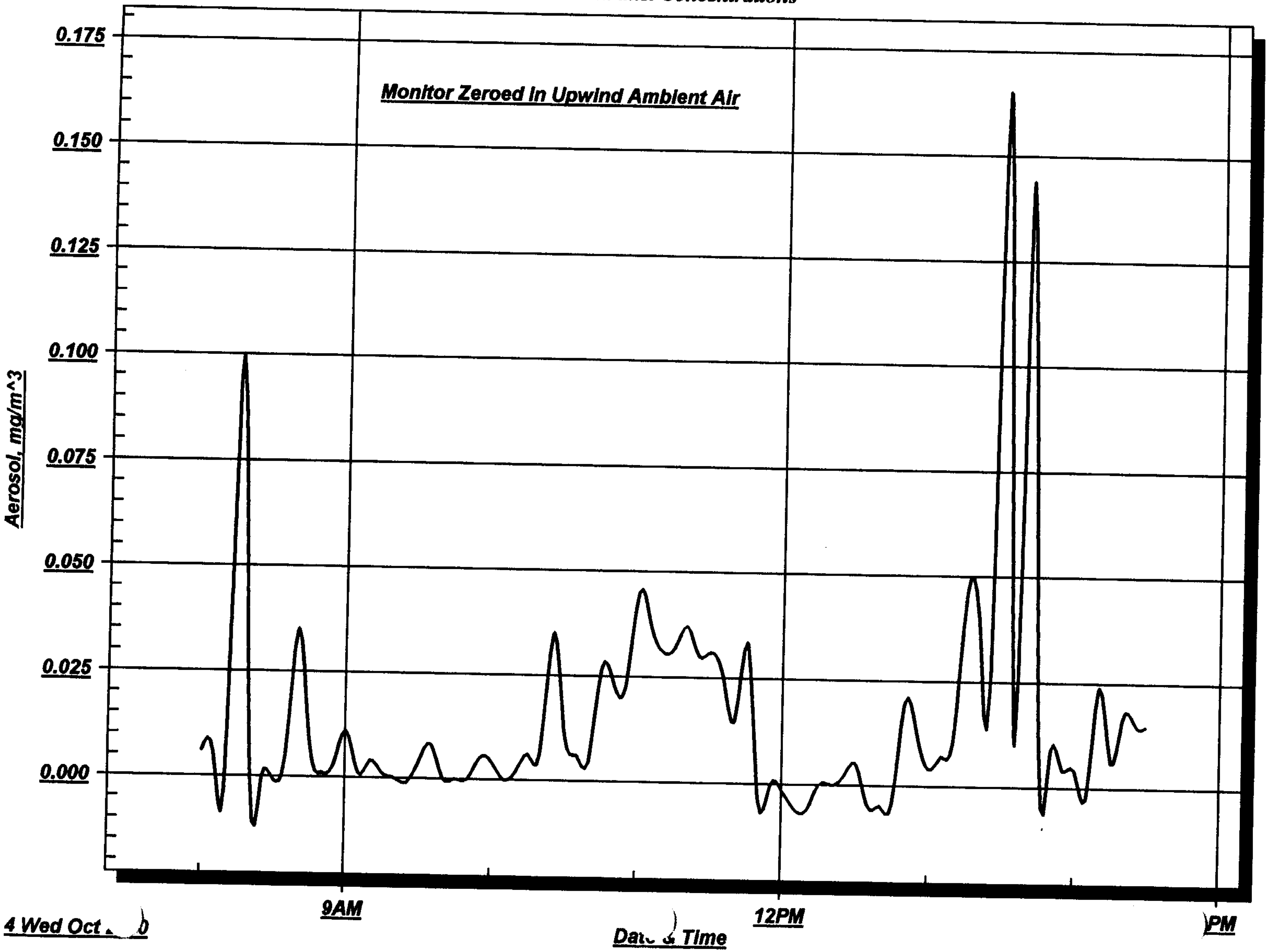
CONTINUED ON REVERSE SIDE

Current Graph: Pilot Plant Down Wind Dust Monitoring Summary 10/4/00
Start time: 07:55:23 10/04/2000 Stop time: 14:30:23 10/04/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	0.016
Lowest point: Time Date	-0.006 12:05:23 10/04/2000
Highest point: Time Date	0.165 13:30:23 10/04/2000
Log interval: hh:mm:ss	00:05:00

Maywood Pilot Study

Down Wind dust Concentrations



AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: Fmss-Pilot	WEATHER CONDITIONS: Cool, gusty wind out of NW	DATE: 10/10/02
PERSON PERFORMING MONITORING: B.A. Miller		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
HWP's used: 014, 015			Dust Trak	21760
016, 017				

INSTRUMENTS CALIBRATION YES [X] NO [ ]

PPE IN USE: See HWP's

PROCESS: Soil Remediation: Excavation, Processing

MONITORING DATA

LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H2S (ppm)
Downwind from Soil Acquisition Area		*					
* See attached graph							
for dust levels							
OV & 4-gas levels noted in SAA							
notebook							

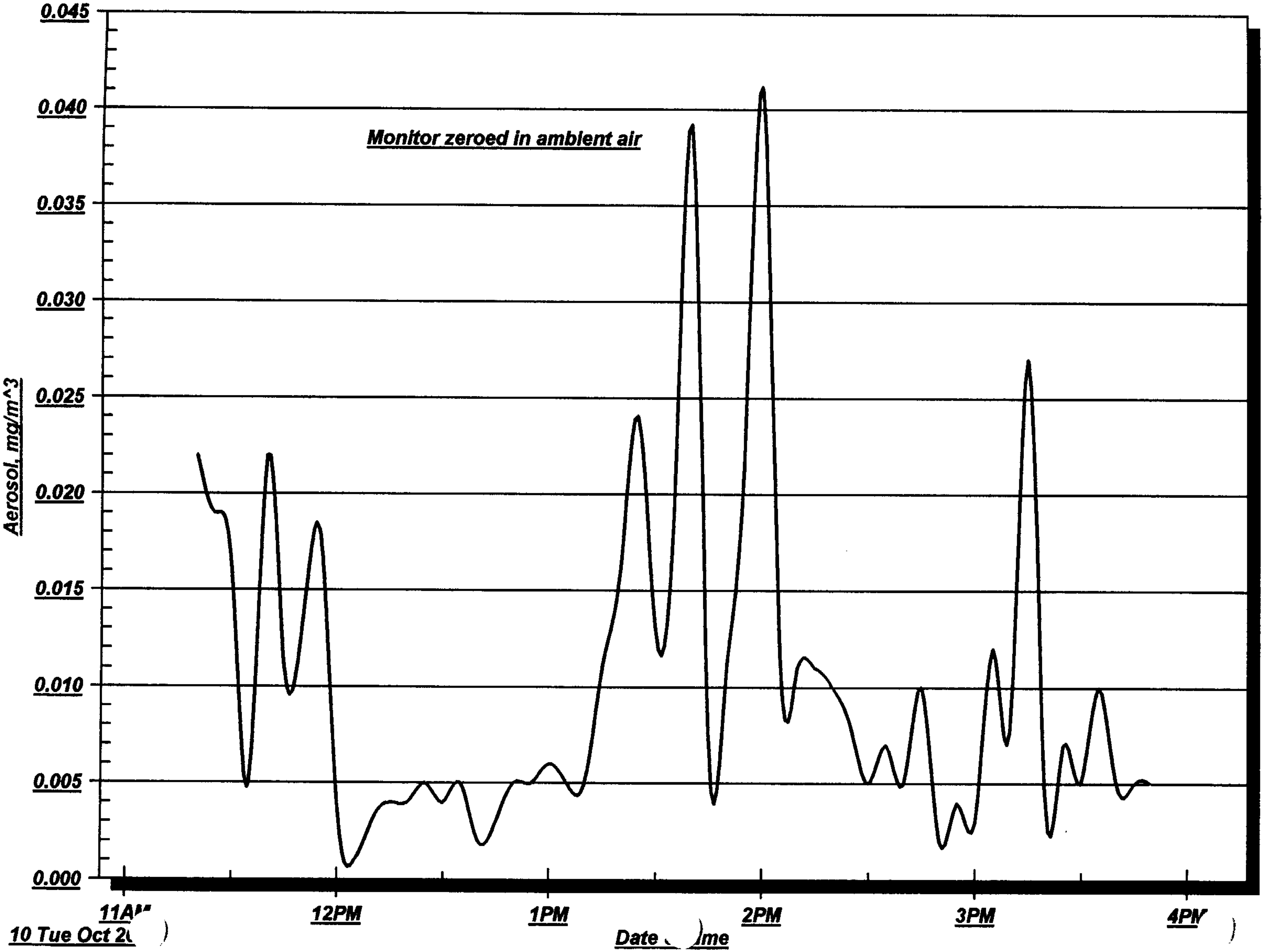
CONTINUED ON REVERSE SIDE

Current Graph: Soil Aquisition Area
Start time: 11:14:53 10/10/2000 Stop time: 15:49:53 10/10/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	0.010
Lowest point: Time Date	0.001 12:04:53 10/10/2000
Highest point: Time Date	0.041 13:59:53 10/10/2000
Log interval: hh:mm:ss	00:05:00

Soil Aquisition Area Excavation Dust Monitoring

10-10-00



AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: SOIL ACQUISTION	WEATHER CONDITIONS: WIND FROM THE SOUTHWEST 46°-69°	DATE: 10-11-00
PERSON PERFORMING MONITORING: BA MILLER		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION	
			TYPE	SERIAL NO.
SEE HWP 14,15,16,17			DUST TRACK	21760

INSTRUMENTS CALIBRATION YES [✓] NO [ ]	PPE IN USE: SEE HWP	PROCESS: SOIL EXCAVATION

MONITORING DATA

LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H2S (ppm)
STATIONARY DUST MONITORING							
NORTHEAST OF RMA BOUNDRY							
(SEE GRAPH DATA)							

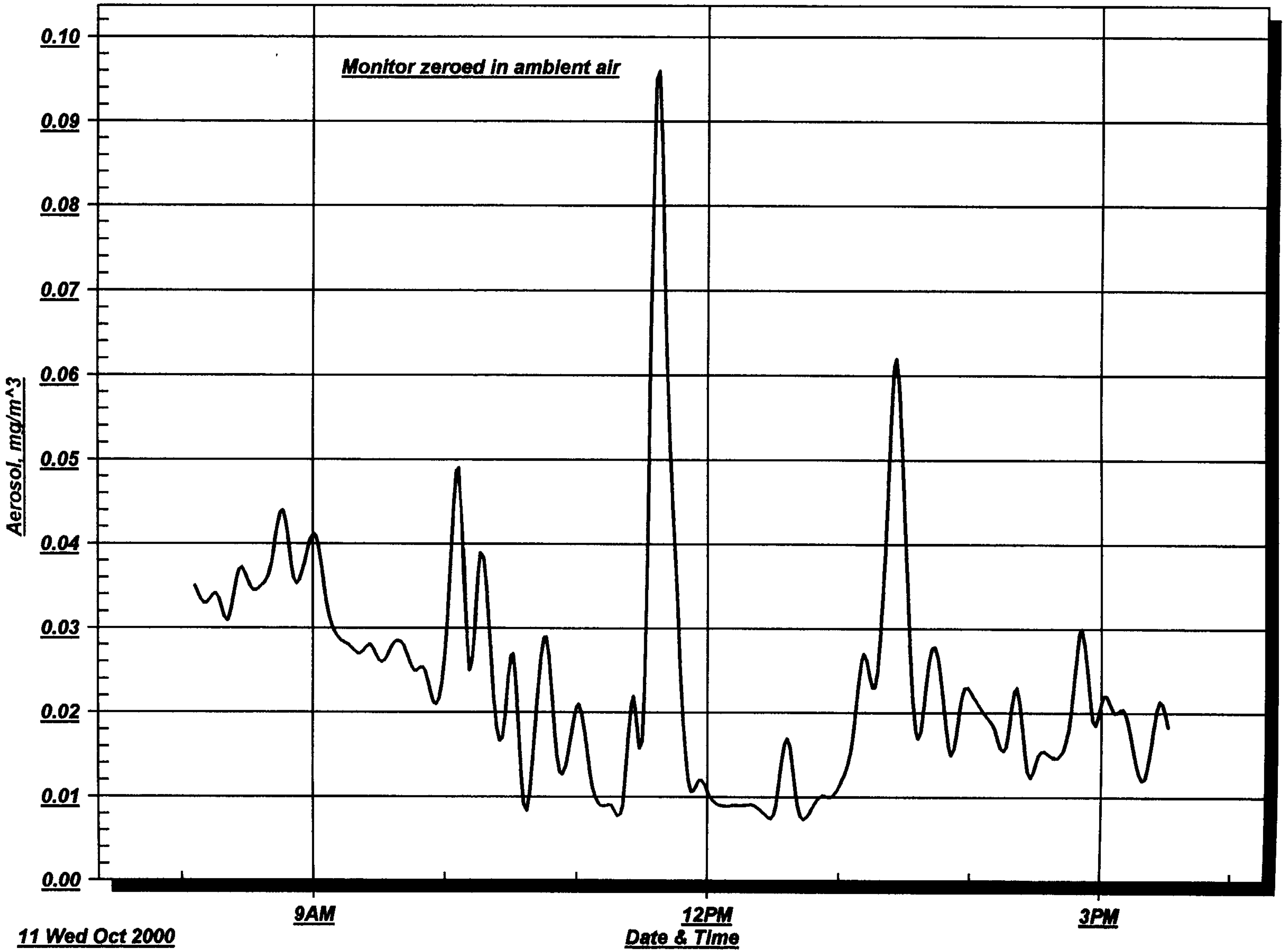
CONTINUED ON REVERSE SIDE

Current Graph: Soil Acquisition Area Downwind Dust Monitoring Summary
Start time: 08:01:08 10/11/2000 Stop time: 15:31:08 10/11/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	0.024
Lowest point: Time Date	0.008 12:26:08 10/11/2000
Highest point: Time Date	0.095 11:36:08 10/11/2000
Log interval: hh:mm:ss	00:05:00

Soil Acquisition Area Downw(ɪ Dust Monitoring Summary

10-11-00



AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: PILOT PLANT	WEATHER CONDITIONS: WIND FROM THE NORTHEAST	DATE: 10-12-00
PERSON PERFORMING MONITORING:		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION	
			TYPE	SERIAL NO.
SEE HWP			DUST TRAK	21760
14,15,16,17				

INSTRUMENTS CALIBRATION YES [✓] NO [ ]	PPE IN USE: SEE HWP	PROCESS: SOIL PROCESSING

MONITORING DATA

LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H2S (ppm)
SOUTHWEST OF PILOT PLANT							
RMA							
(SEE GRAPH DATA)							

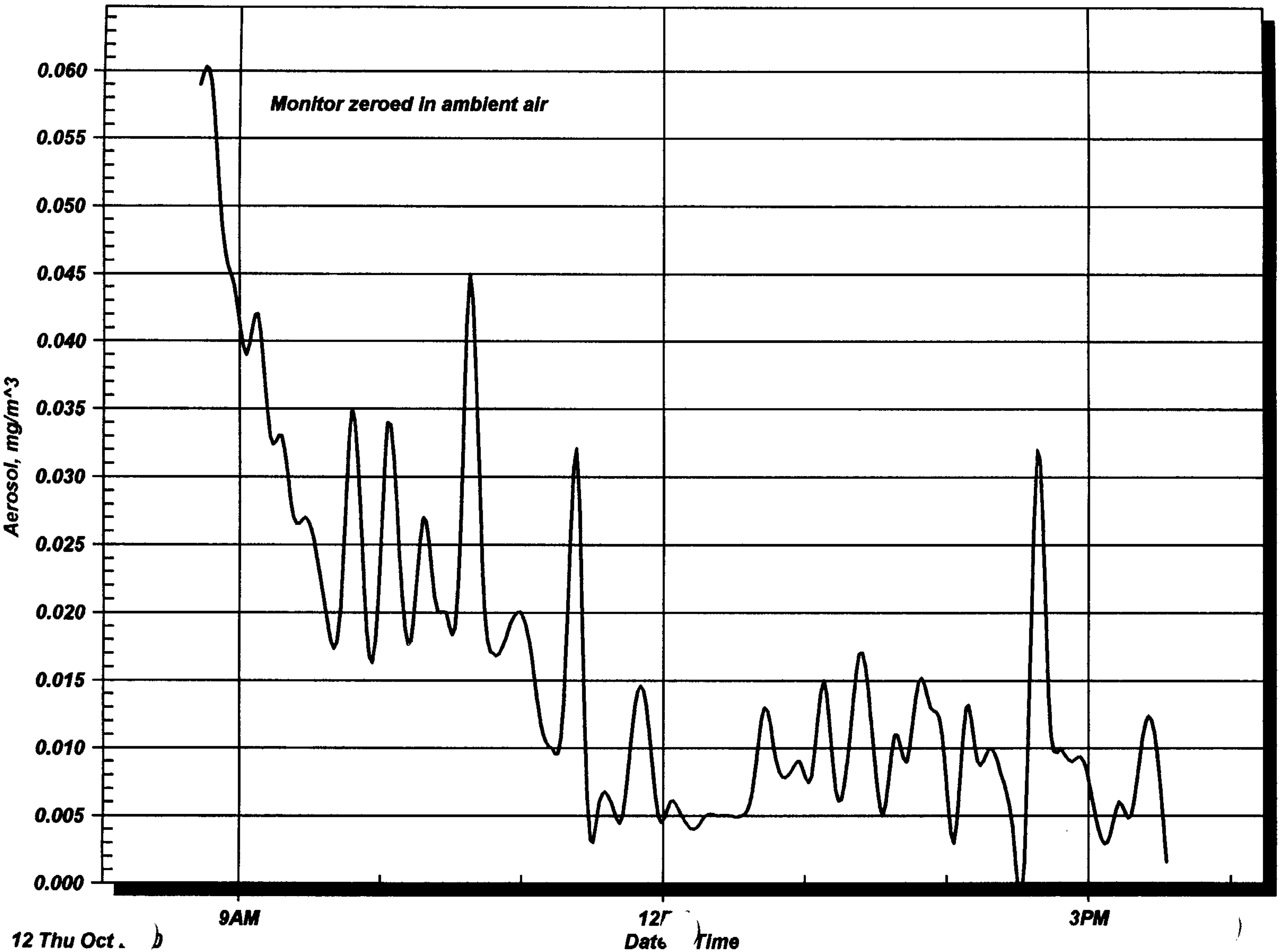
CONTINUED ON REVERSE SIDE

Current Graph: Pilot Plant Downwind Dust Monitoring Study
Start time: 08:37:56 10/12/2000 Stop time: 15:32:56 10/12/2000

Legend:	Aerosol
Channel:	Aerosol
(Units)	mg/m^3
Average:	0.016
Lowest point:	0.001
Time	15:32:56
Date	10/12/2000
Highest point:	0.059
Time	08:42:56
Date	10/12/2000
Log interval:	00:05:00
hh:mm:ss	

Pilot Plant Downwind Dust Monitoring Study

10-12-00



AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: SOIL ACQUISITION	WEATHER CONDITIONS: NORTHWEST WIND	DATE: 10-19-00
PERSON PERFORMING MONITORING:		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION	
			TYPE	SERIAL NO.
SEE HWP			DUST TRAK	21760
14,15,16,17				

INSTRUMENTS CALIBRATION	PPE IN USE:	PROCESS:
YES [✓] NO [ ]	SEE HWP	SOIL EXCAVATION

MONITORING DATA

LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H2S (ppm)
SOIL ACQUISITION AREA –							
DOWN WIND DUST MONITORING							
DURING EXCAVATION –							
SEE ATTACHED DATA							

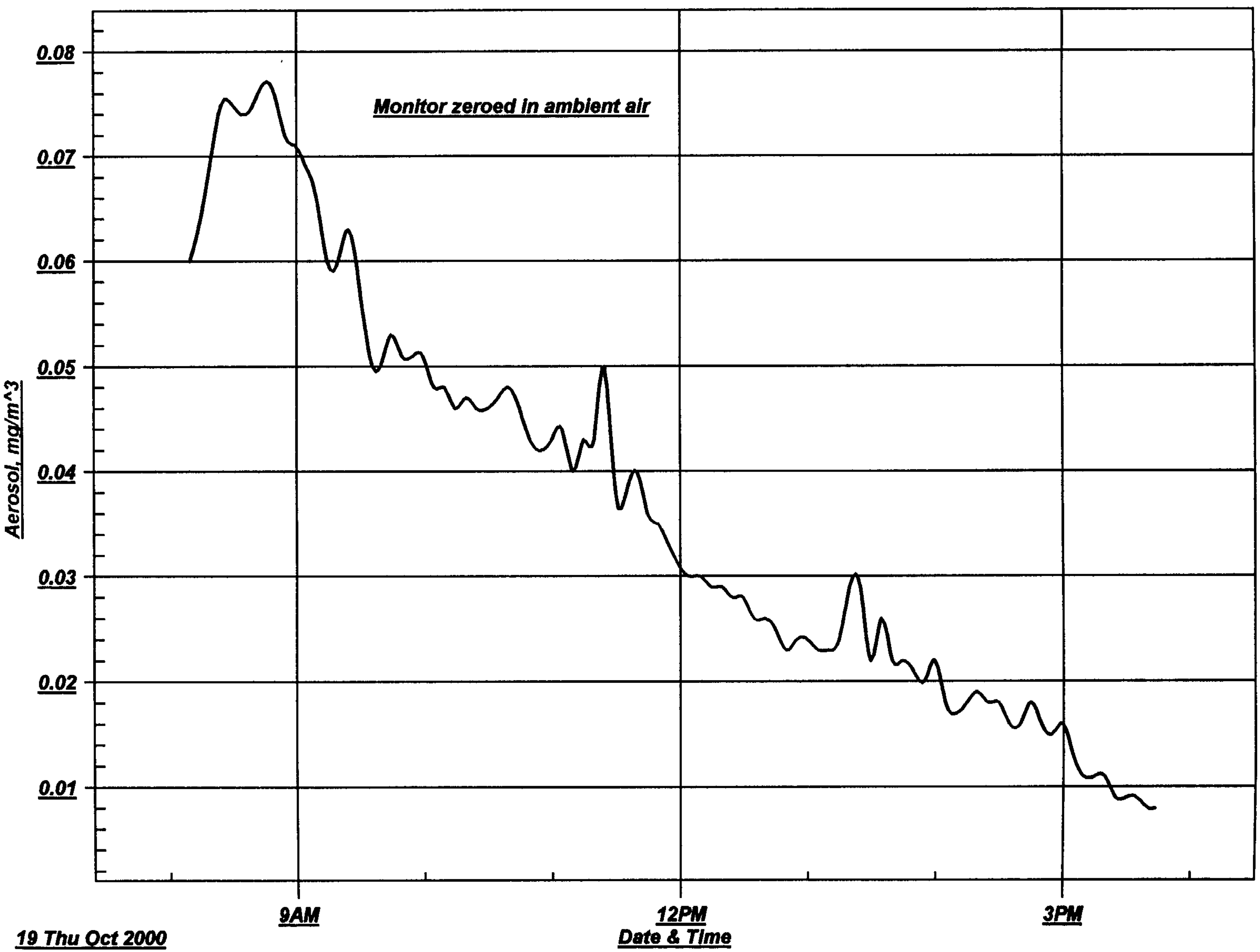
CONTINUED ON REVERSE SIDE

Current Graph: Soil Acquisition Downwind Dust Monitoring Summary
Start time: 08:04:34 10/19/2000 Stop time: 15:44:34 10/19/2000

Legend:	Aerosol
Channel:	Aerosol
(Units)	mg/m^3
Average:	0.037
Lowest point:	0.008
Time	15:39:34
Date	10/19/2000
Highest point:	0.077
Time	08:44:34
Date	10/19/2000
Log interval:	00:05:00
hh:mm:ss	

Soil Acquisition Downwind ust Monitoring Summary

10-19-00



AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: FMSS: PILOT	WEATHER CONDITIONS: CLEAR/COOL	DATE: 10-31-00
PERSON PERFORMING MONITORING: R. SPILLANE		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION: TYPE	SERIAL NO.
D. PARIS	6.7	FES	TSI DUST TRAK	

INSTRUMENTS CALIBRATION	PPE IN USE:	PROCESS:
YES [✓] NO [ ]	SEE HWP 015	SOIL PROCESSING

MONITORING DATA

LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H_2S (ppm)
PILOT PAD RMA @ MANLIFT PLATFORM	0812						~~6~~ RS
	↓						
SEE ATTACHED graph & SUMMARY							
sheet for dust level RESULTS	1412						

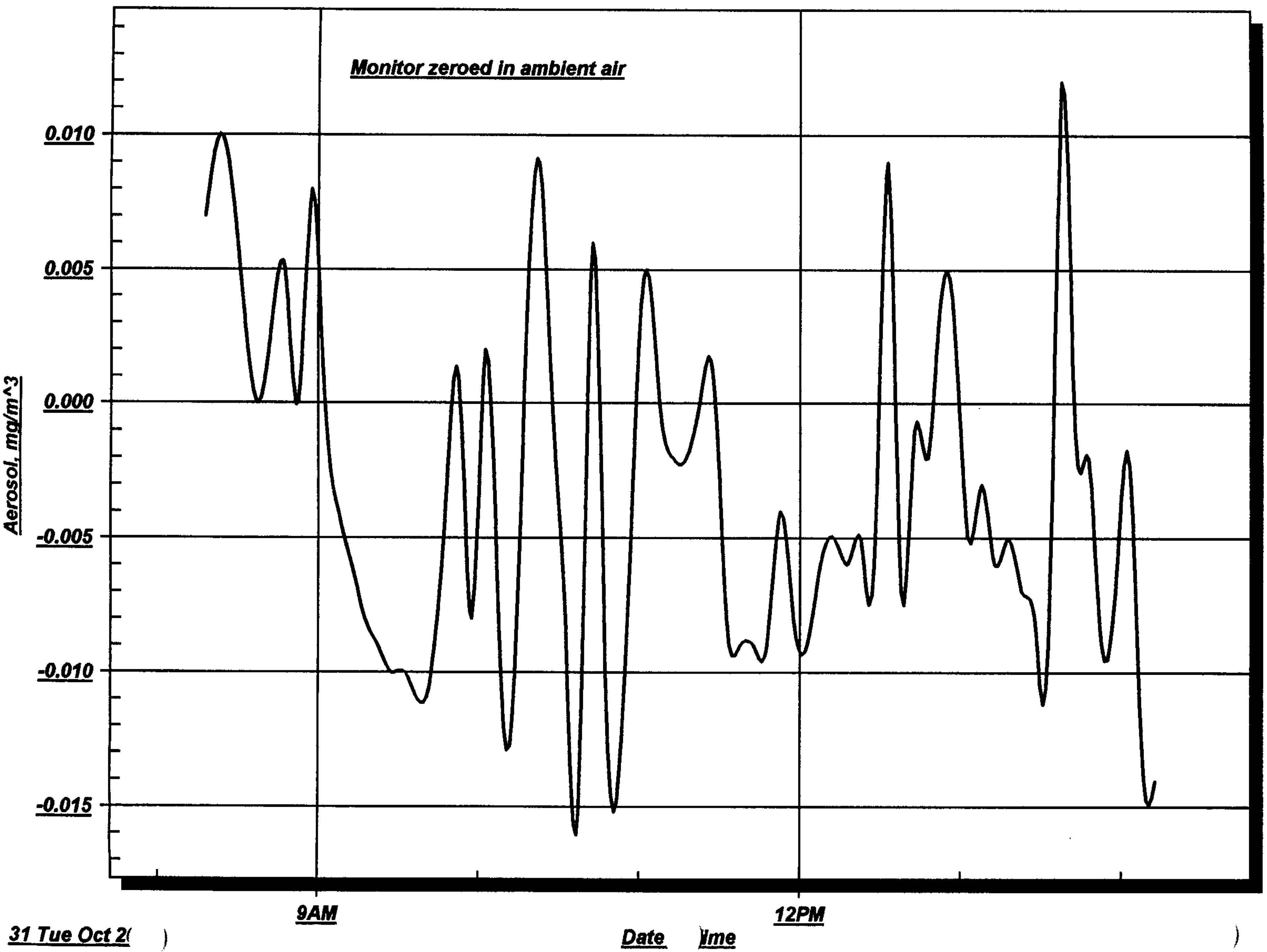
CONTINUED ON REVERSE SIDE

Current Graph: Pilot Plant Manlift Work Area
Start time: 08:12:34 10/31/2000 Stop time: 14:12:34 10/31/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	-0.003
Lowest point:	-0.015
Time	10:37:34
Date	10/31/2000
Highest point:	0.012
Time	13:37:34
Date	10/31/2000
Log interval: hh:mm:ss	00:05:00

Pilot Plant Manlift Work Area

10/31/00



AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: FMSS: Pilot	WEATHER CONDITIONS: Clear / Cool	DATE: 10/31/00
PERSON PERFORMING MONITORING:		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
Angelo Garcia	7	Thermo	TSI Dust Trak	21762
Dan Cordova	7	Thermo	TSI Dust Trak	21762

INSTRUMENTS CALIBRATION	PPE IN USE:	PROCESS:
YES [✓] NO [ ]	See HWP 14	Soil Processing

MONITORING DATA

LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H_2S (ppm)
SGS Platform @ Pilot Pad RMA	1036						
	↓						
See Attached Graph & Summary							
Sheet for Dust level Results	1522						

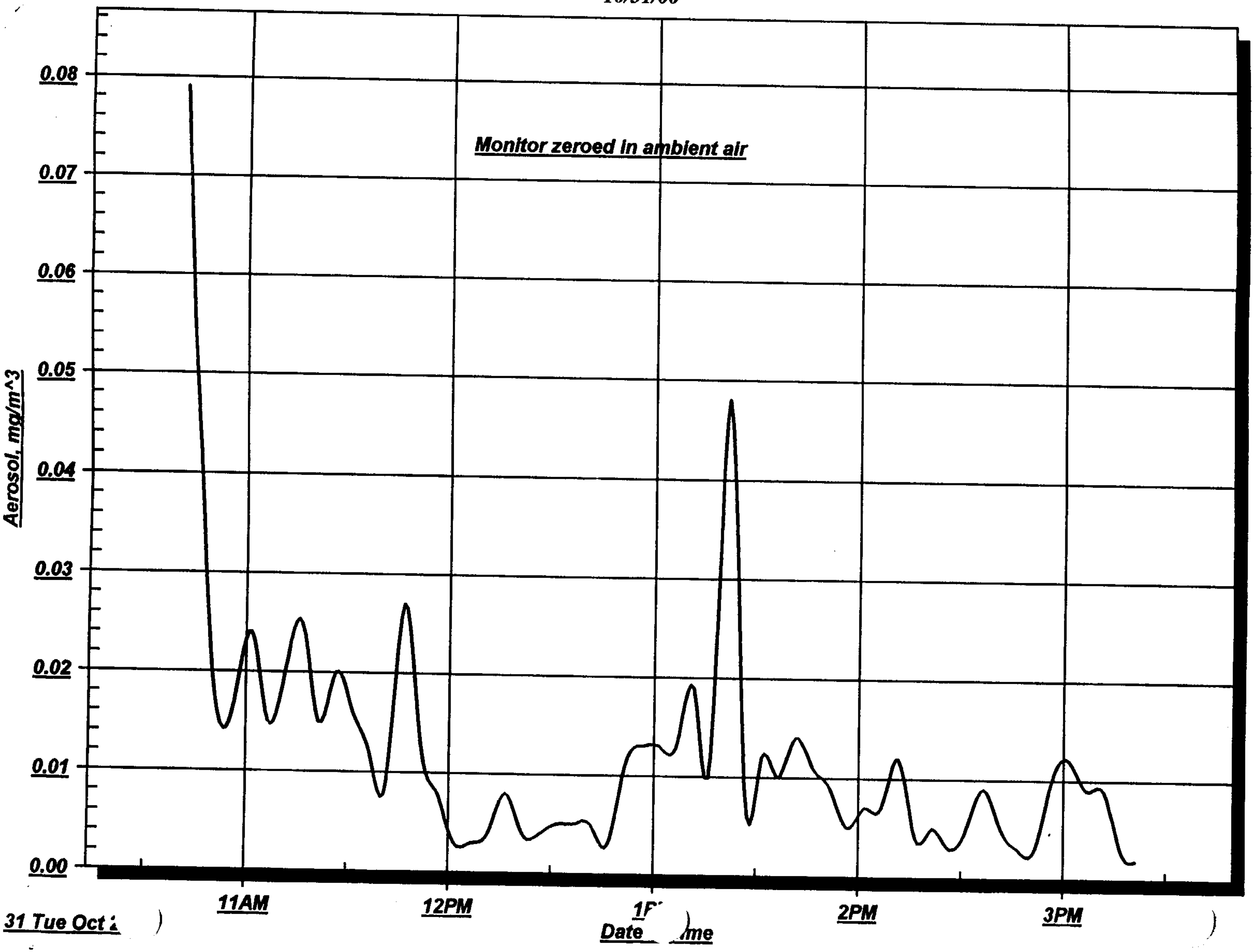
CONTINUED ON REVERSE SIDE

Current Graph: SGS Platform Work Area
Start time: 10:36:35 10/31/2000 Stop time: 15:21:35 10/31/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	0.012
Lowest point: Time Date	0.002 15:21:35 10/31/2000
Highest point: Time Date	0.079 10:41:35 10/31/2000
Log interval: hh:mm:ss	00:05:00

SGS Platform Work Area

10/31/00



AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: FMSS: PiloT	WEATHER CONDITIONS: CLEAR / COOL	DATE: 11/01/00
PERSON PERFORMING MONITORING: B. Spillane BS		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
R. KOETZLE	7.0	FES	TSI DUST TRAK	21760

INSTRUMENTS CALIBRATION YES [✓] NO [ ]	PPE IN USE: SEE HASP # 14	PROCESS: SOIL PROCESSING

MONITORING DATA

LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H_2S (ppm)
BiviTec PLANT @ PiLoT PAD RMA	0753						
	↓						
SEE ATTACHED GRAPH & SUMMARY							
Sheet for Dust level RESULTS							
	15:08						

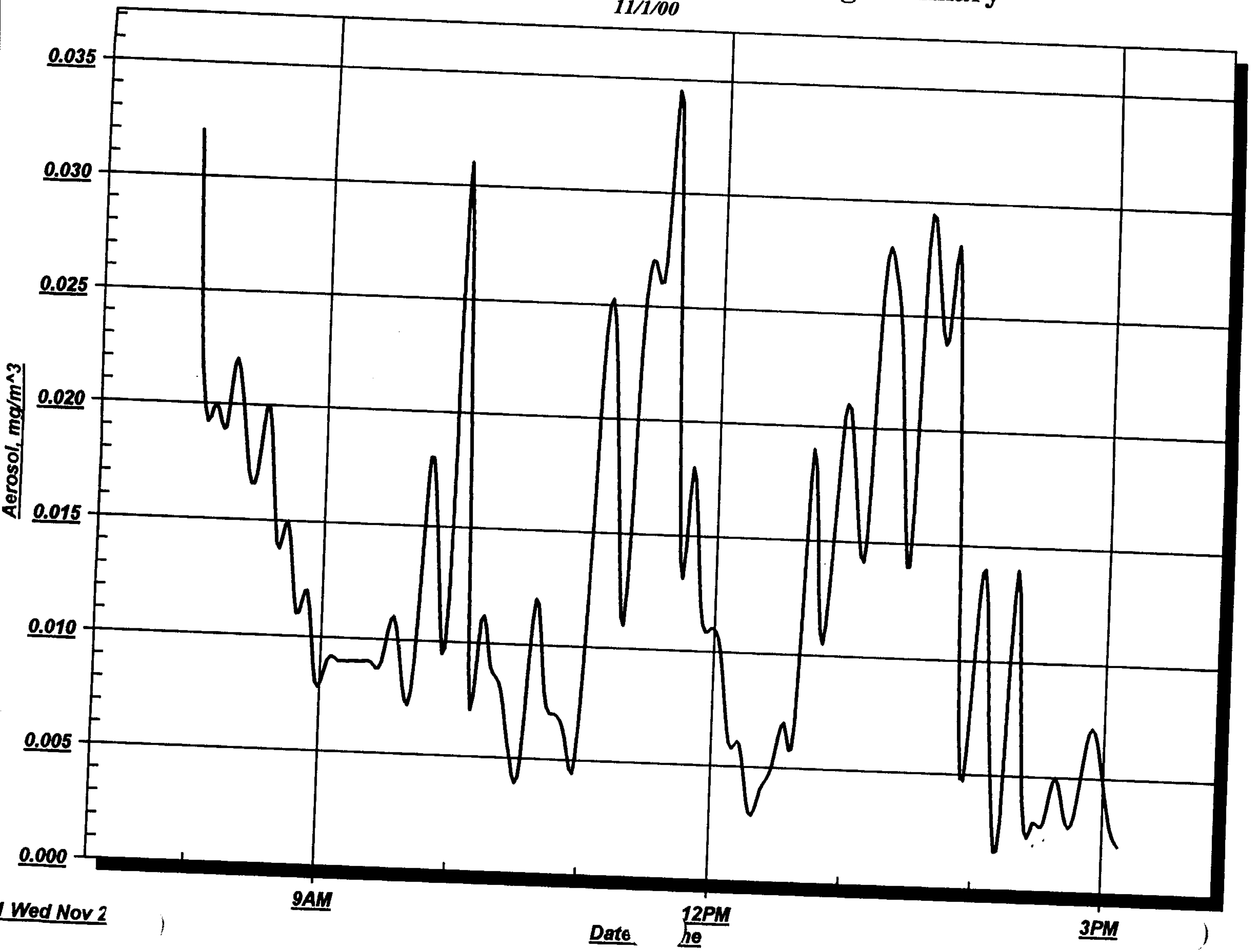
CONTINUED ON REVERSE SIDE

Current Graph: Pilot Plant Bivitec Unit Dust Monitoring Summary
Start time: 07:53:03 11/01/2000 Stop time: 15:08:03 11/01/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	0.013
Lowest point: Time Date	0.002 15:08:03 11/01/2000
Highest point: Time Date	0.034 11:38:03 11/01/2000
Log interval: hh:mm:ss	00:05:00

Pilot Plant Bivitec Unit Dust Monitoring Summary

11/1/00



AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: FMSS: PILOT	WEATHER CONDITIONS: CLEAR / COOL	DATE: 11/01/00

PERSON PERFORMING MONITORING: B. Spillane

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
Angelo Garcia	4.25	THERMO	TSI DUST TRAK	21762
Dan Cordova	6.32	THERMO	TSI DUST TRAK	21762

INSTRUMENTS CALIBRATION YES [✓] NO [ ]

PPE IN USE: SEE HWP 14

PROCESS: SOIL PROCESSING

MONITORING DATA

LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H2S (ppm)
SGS PLATFORM @ PILOT PAD RMA	0758						
	↓						
SEE ATTACHED GRAPH & SUMMARY							
SHEET FOR DUST LEVEL RESULTS							
	1508						

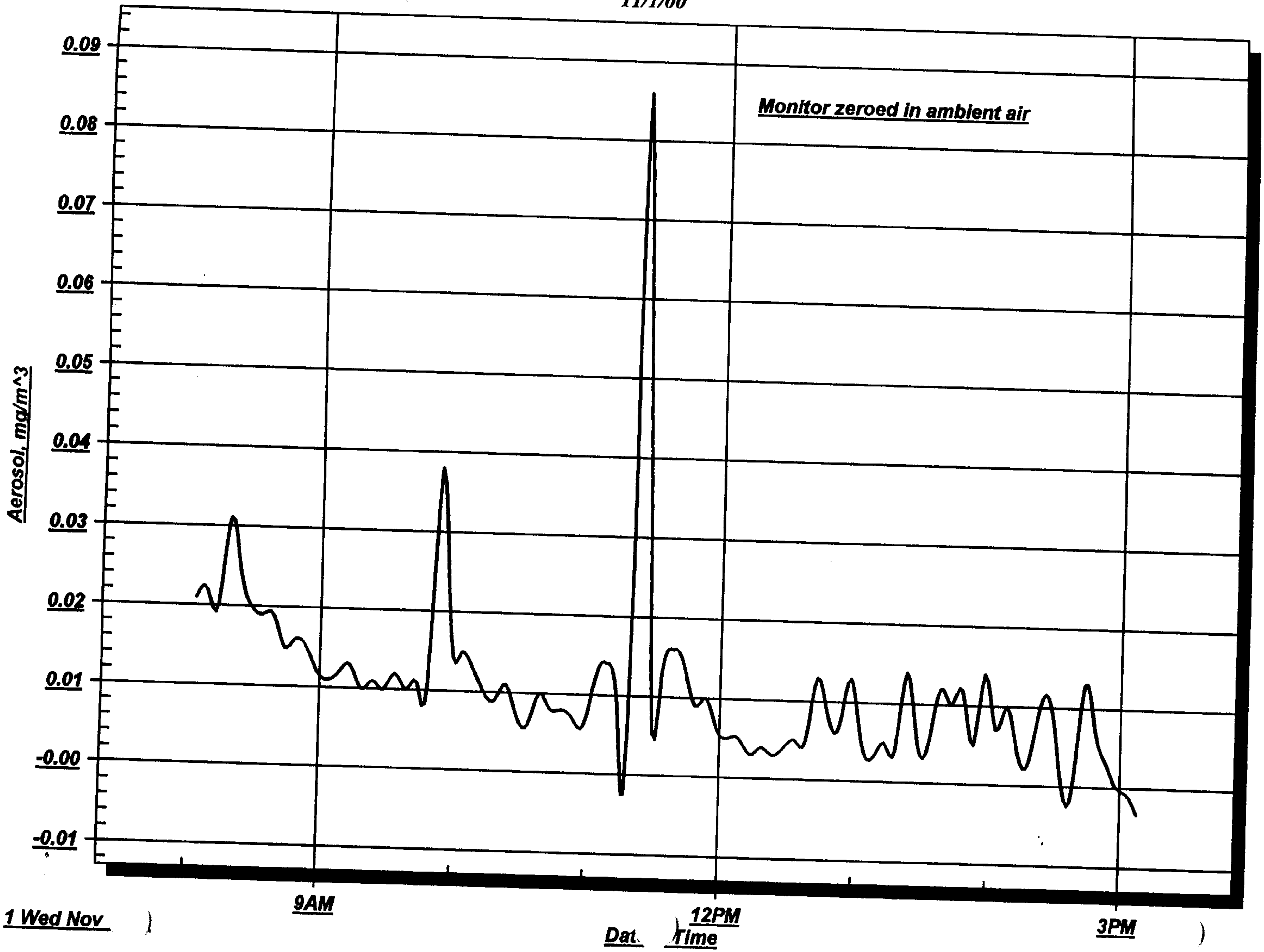
CONTINUED ON REVERSE SIDE

Current Graph: Pilot Plant SGS Dust Monitoring Summary
Start time: 07:58:37 11/01/2000 Stop time: 15:08:37 11/01/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	0.011
Lowest point:	-0.004
Time	15:08:37
Date	11/01/2000
Highest point:	0.086
Time	11:23:37
Date	11/01/2000
Log interval: hh:mm:ss	00:05:00

Pilot Plant SGS Dust Monitoring Summary

11/1/00



AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: FMSS: P.loT	WEATHER CONDITIONS: CLEAR / COOL	DATE: 11/02/00
PERSON PERFORMING MONITORING: B. Spillane		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
Angelo Garcia	7.33	THERMO	TSI DUST TRAK	21762
Dan Cordova	7.42	THERMO	TSI DUST TRAK	21762

INSTRUMENTS CALIBRATION YES [✓] NO [ ]

PPE IN USE: ~~Soil A~~ SEE HWP 14

PROCESS: SOIL PROCESSING

MONITORING DATA

LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H_2S (ppm)
SGS PLATFORM @ P.loT PAD RMA	0824						
	↓						
SEE ATTACHED GRAPH & SUMMARY							
SHEET FOR DUST LEVEL RESULTS							
	1509						

CONTINUED ON REVERSE SIDE

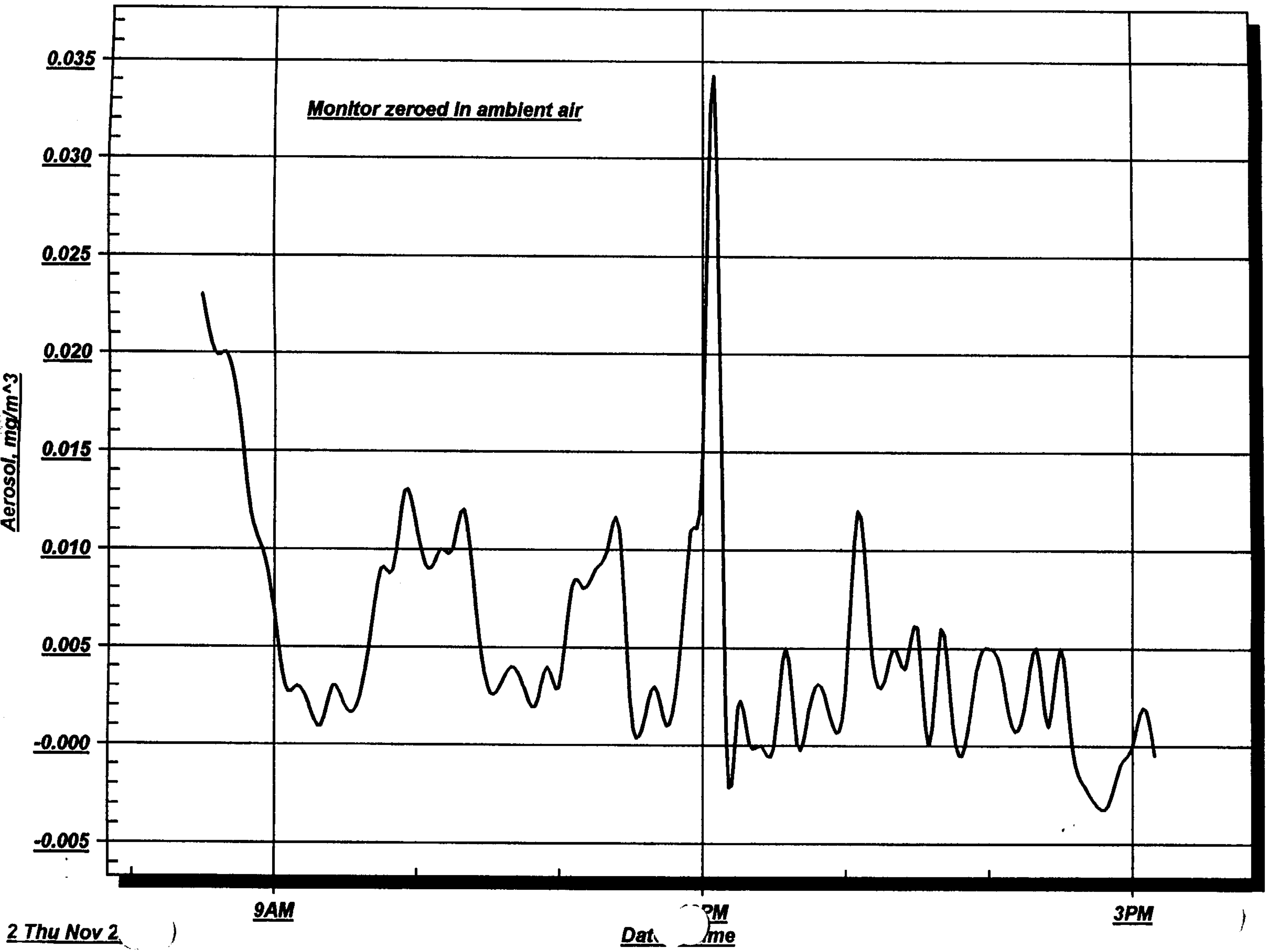
Current Graph: Pilot Plant SGS Platform Dust Monitoring Summary

Start time: 08:24:48 11/02/2000 Stop time: 15:09:48 11/02/2000

Legend:	Aerosol
Channel:	Aerosol
(Units)	mg/m^3
Average:	0.005
Lowest point:	-0.003
Time	14:44:48
Date	11/02/2000
Highest point:	0.034
Time	12:04:48
Date	11/02/2000
Log interval:	00:05:00
hh:mm:ss	

Pilot Plant SGS Platform Dust Monitoring Summary

11/2/00



AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: EMSS: PilOT	WEATHER CONDITIONS: CLEAR / COOL	DATE: 11/02/00
PERSON PERFORMING MONITORING: B. SPILLANE		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	INSTRUMENT INFORMATION SERIAL NO.
D. PARIS	7	FES	TSI DUST TRAK	21760

INSTRUMENTS CALIBRATION	PPE IN USE:	PROCESS:
YES [✓] NO [ ]	SEE HWP 15	SOIL PROCESSING

MONITORING DATA

LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H_2S (ppm)
MANLIFT @ SOIL FEED HOPPER	0823						
PILOT PAD RMA	↓						
SEE ATTACHED GRAPH & SUMMARY							
sheet FOR DUST level RESULTS							
	1408						

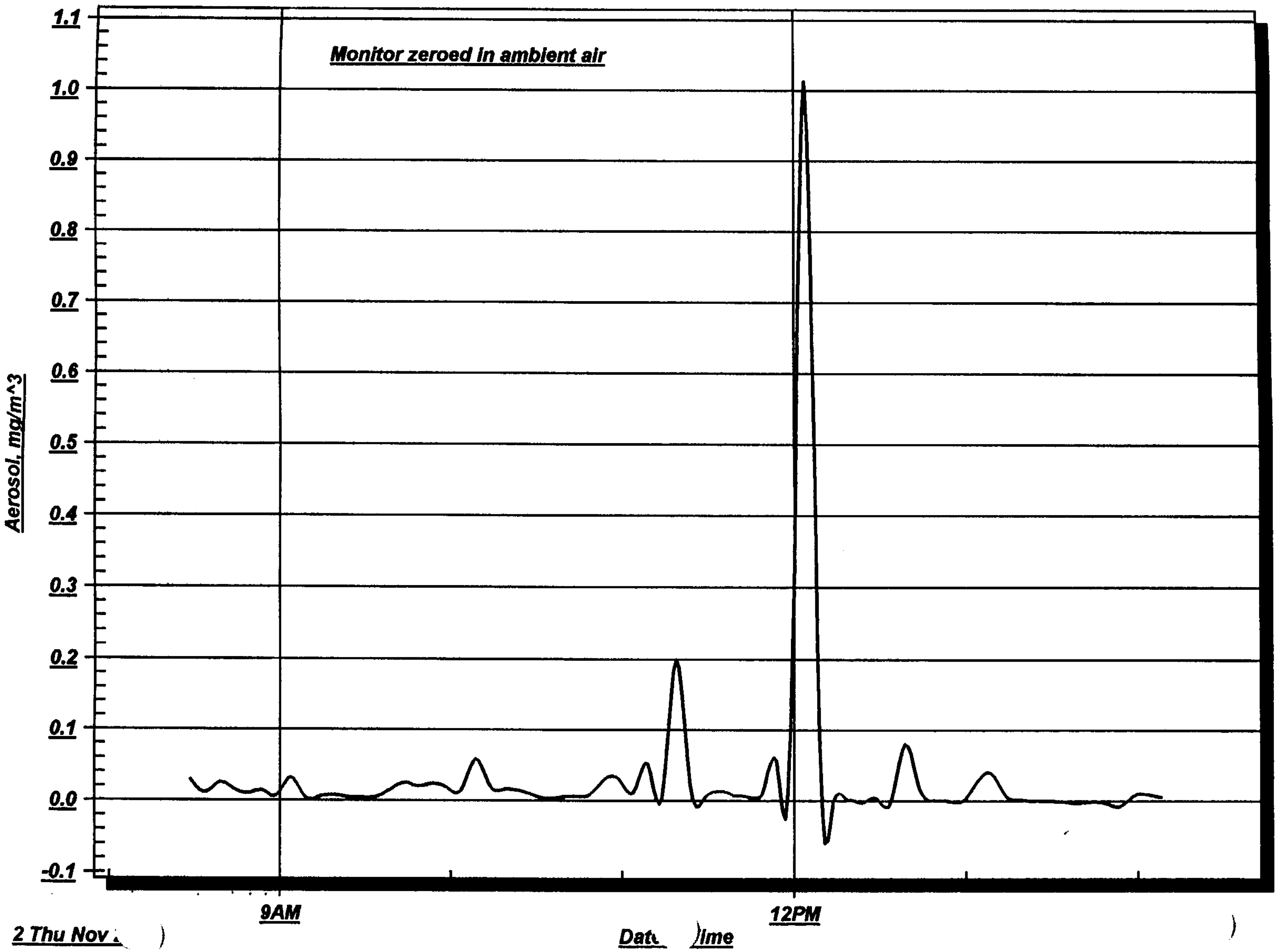
CONTINUED ON REVERSE SIDE

Current Graph: Pilot Plant Bivitec Manlift Dust Summary
Start time: 08:23:45 11/02/2000 Stop time: 14:08:44 11/02/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	0.033
Lowest point:	-0.007
Time	13:53:45
Date	11/02/2000
Highest point:	1.013
Time	12:03:45
Date	11/02/2000
Log interval: hh:mm:ss	00:05:00

Pilot Plant Bivitec Manlift Dust Summary

11/2/00



AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: FMSS: Pilot	WEATHER CONDITIONS: Fair, sunny, mild SW wind	DATE: 11/3/00

PERSON PERFORMING MONITORING: R. Spillane

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
D. Cordova	6.3	Thermo	TSI Dust Trak	
M. Swartout	6.3	Thermo		
A. Garci	6.3	Thermo		
J.M. Brown	5.3	Thermo		

INSTRUMENTS CALIBRATION	PPE IN USE:	PROCESS:
YES [X] NO [ ]	See HWP 015	Thermo SGS

MONITORING DATA

LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H_2S (ppm)
Thermo SGS platform	0840						
	↓						
See attached graph & summary sheet	↓						
for dust level results.	1517						

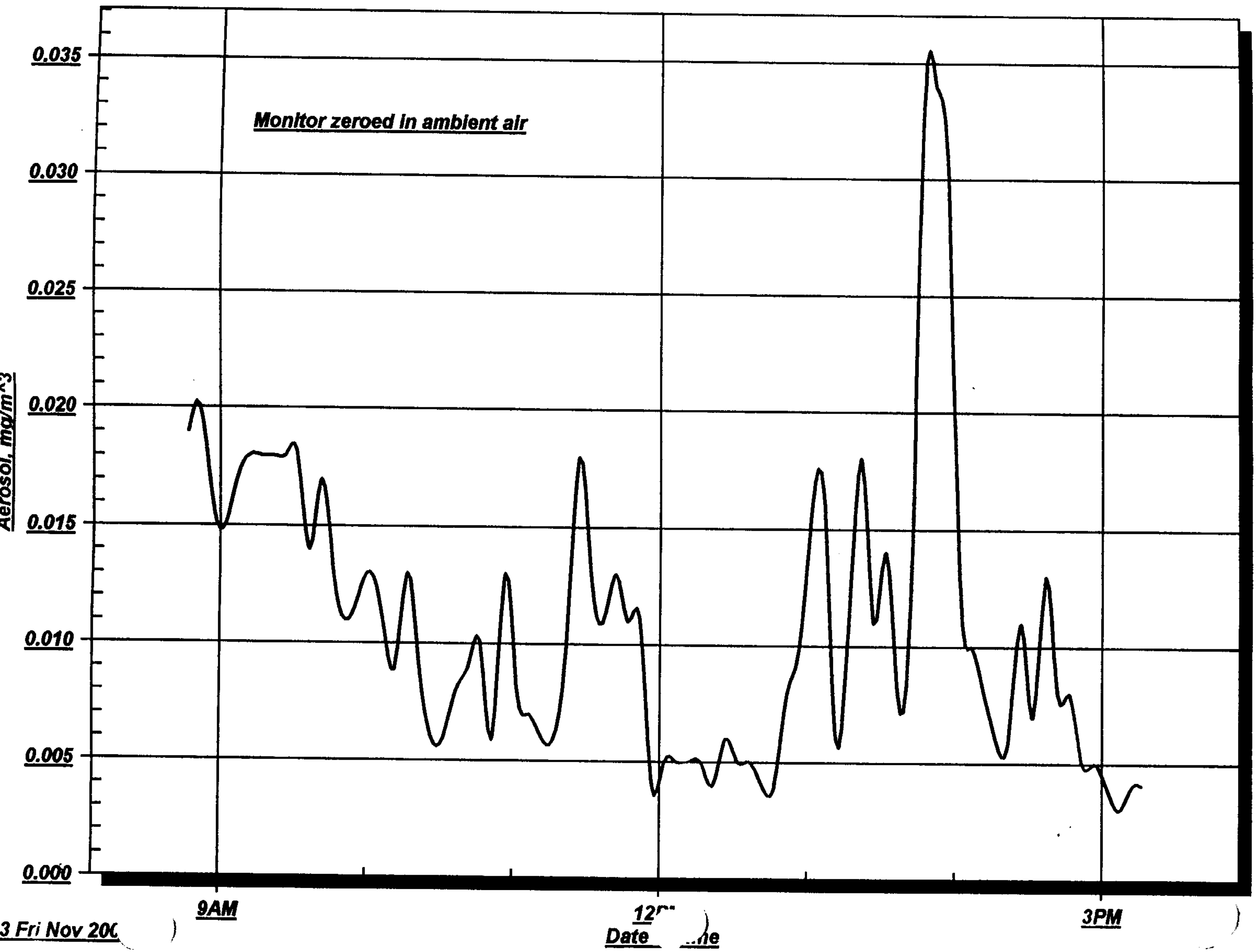
CONTINUED ON REVERSE SIDE

Current Graph: Pilot Plant SGS Dust Monitoring Summary
Start time: 08:41:48 11/03/2000 Stop time: 15:16:48 11/03/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	0.011
Lowest point: Time Date	0.003 15:06:48 11/03/2000
Highest point: Time Date	0.034 13:51:48 11/03/2000
Log interval: hh:mm:ss	00:05:00

Pilot Plant SGS Dust Monitoring Summary

11/3/00



AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: FMSS	WEATHER CONDITIONS: Fair, mild	DATE: 11/06/00

PERSON PERFORMING MONITORING: R. Spillane

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
J.M. Brown	2.75	Thermo	TSI DustTrak	21760
D. Cordova	6.4	Thermo		
A. Garci	6.5	Thermo		
M. Swartout	6.2	Thermo		

INSTRUMENTS CALIBRATION YES [✓] NO [ ]	PPE IN USE:	PROCESS:

MONITORING DATA

LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H2S (ppm)
Pilot plant Slab	0759						
	↓						
	1514						

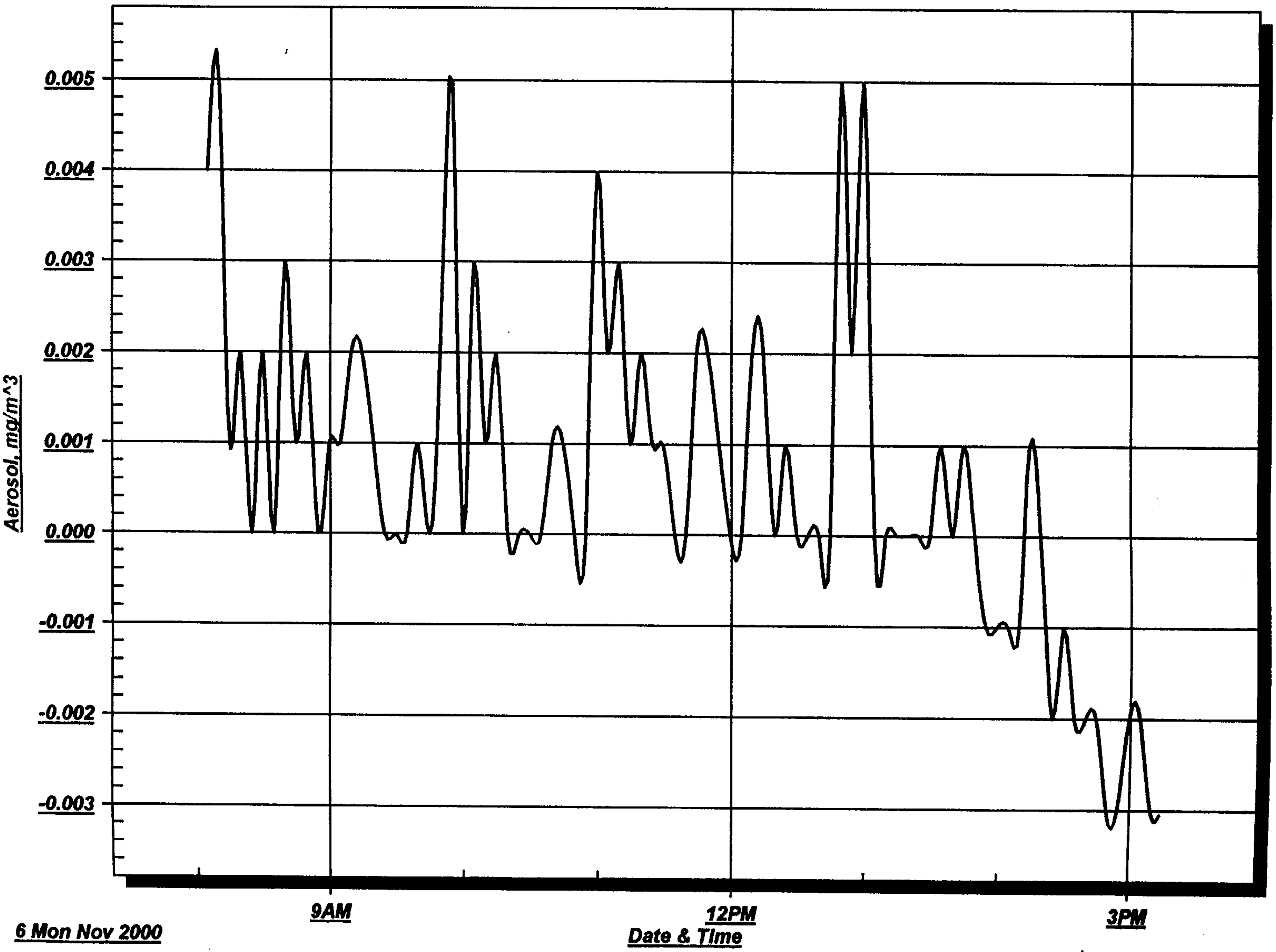
CONTINUED ON REVERSE SIDE

Current Graph: Pilot Plant SGS Unit Dust Monitoring Summary
Start time: 07:59:22 11/06/2000 Stop time: 15:14:22 11/06/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	0.001
Lowest point: Time Date	-0.003 14:49:22 11/06/2000
Highest point: Time Date	0.005 08:09:22 11/06/2000
Log interval: hh:mm:ss	00:05:00

Pilot Plant SGS Unit Du[illegible] Monitoring Summary

11/6/00



AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: FMSS	WEATHER CONDITIONS: Fair, mild 50's	DATE: 11/07/00
PERSON PERFORMING MONITORING: R. Spillane		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
D. Paris	5.75 L	F.E.S.	TSI Dust Trak	CENAN 21763
F. Rodes	6.6	F.E.S.		
R. Koetzle	1.5	F.E.S.		
J. Caves	0.6	F.E.S.		
F. Nardone	0.6	F.E.S.		

INSTRUMENTS CALIBRATION	PPE IN USE:	PROCESS:
YES [X] NO [ ]	See HWP 015	Gravel separation

MONITORING DATA

LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H2S (ppm)
Pilot Plant: Barike Shaker	0807						
	↓						
See attached graph & Summary sheet							
for dust levels info.							
	↓						
	1523						

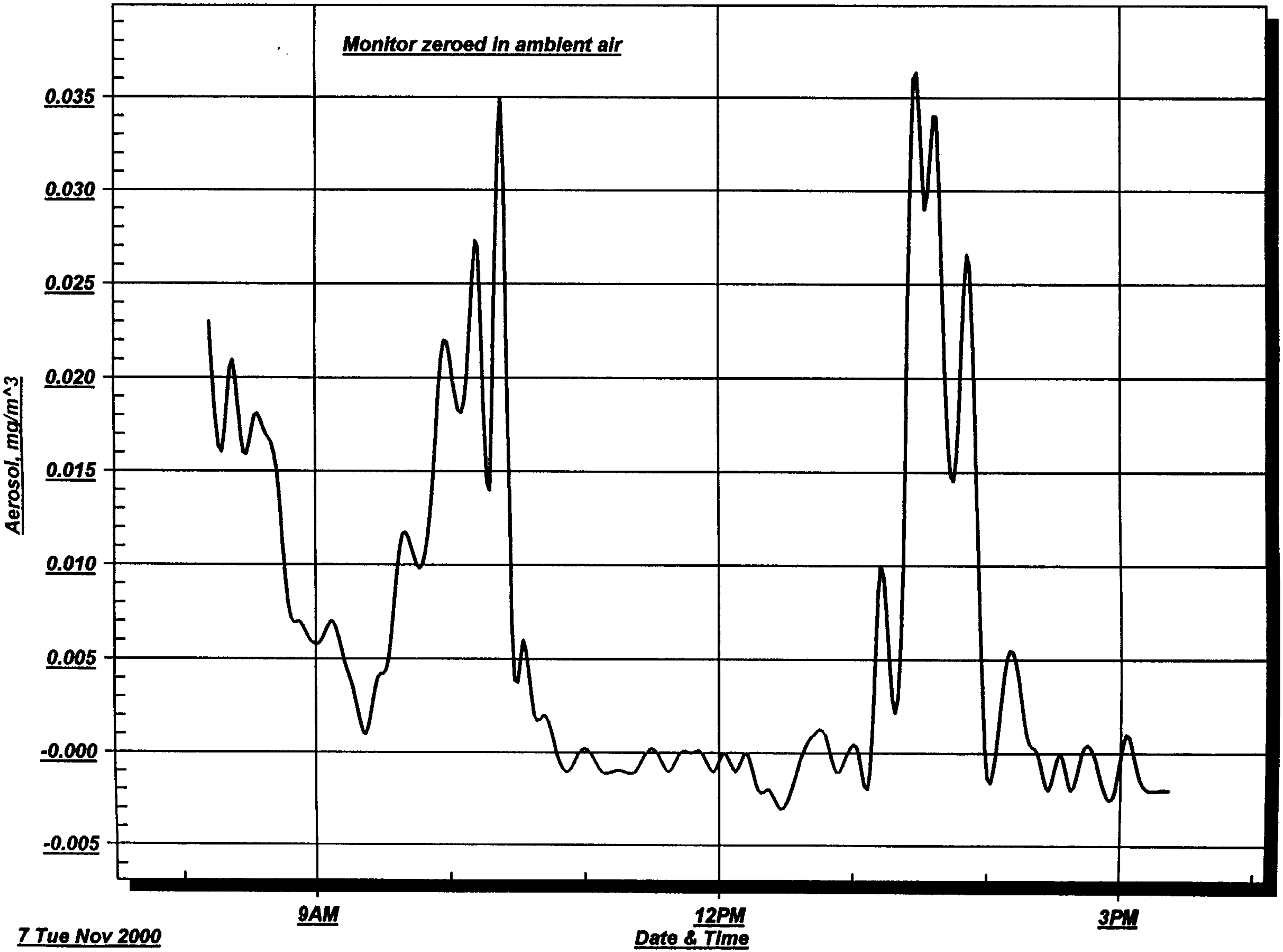
CONTINUED ON REVERSE SIDE

Current Graph: Pilot Plant Bivitec Dust Monitoring Summary
Start time: 08:07:30 11/07/2000 Stop time: 15:22:30 11/07/2000

Legend:	Aerosol
Channel:	Aerosol
(Units)	mg/m^3
Average:	0.006
Lowest point:	-0.003
Time	12:27:30
Date	11/07/2000
Highest point:	0.036
Time	13:27:30
Date	11/07/2000
Log interval:	00:05:00
hh:mm:ss	

Pilot Plant Bivitec Dust Monitoring Summary

11/7/00



AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: FMSS	WEATHER CONDITIONS: Fair, mild, light wind 50's	DATE: 11/07/00
PERSON PERFORMING MONITORING: R. Spillane		

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	INSTRUMENT INFORMATION SERIAL NO.
D. Cordova	8.5	Thermo	TSI Dust Trak	CENAN 21760
A. Garci	7.5	Thermo		
J.M. Brown	8.5	Thermo		
M. Swartout	8.5	Thermo		

INSTRUMENTS CALIBRATION	PPE IN USE:	PROCESS:
YES [✓] NO [ ]	See AWP 014	SGS Sorting

MONITORING DATA

LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H_2S (ppm)
Pilot Plant: SGS platform	0806						
	↓						
See attached graph & summary sheet for							
dust levels info							
	1226						

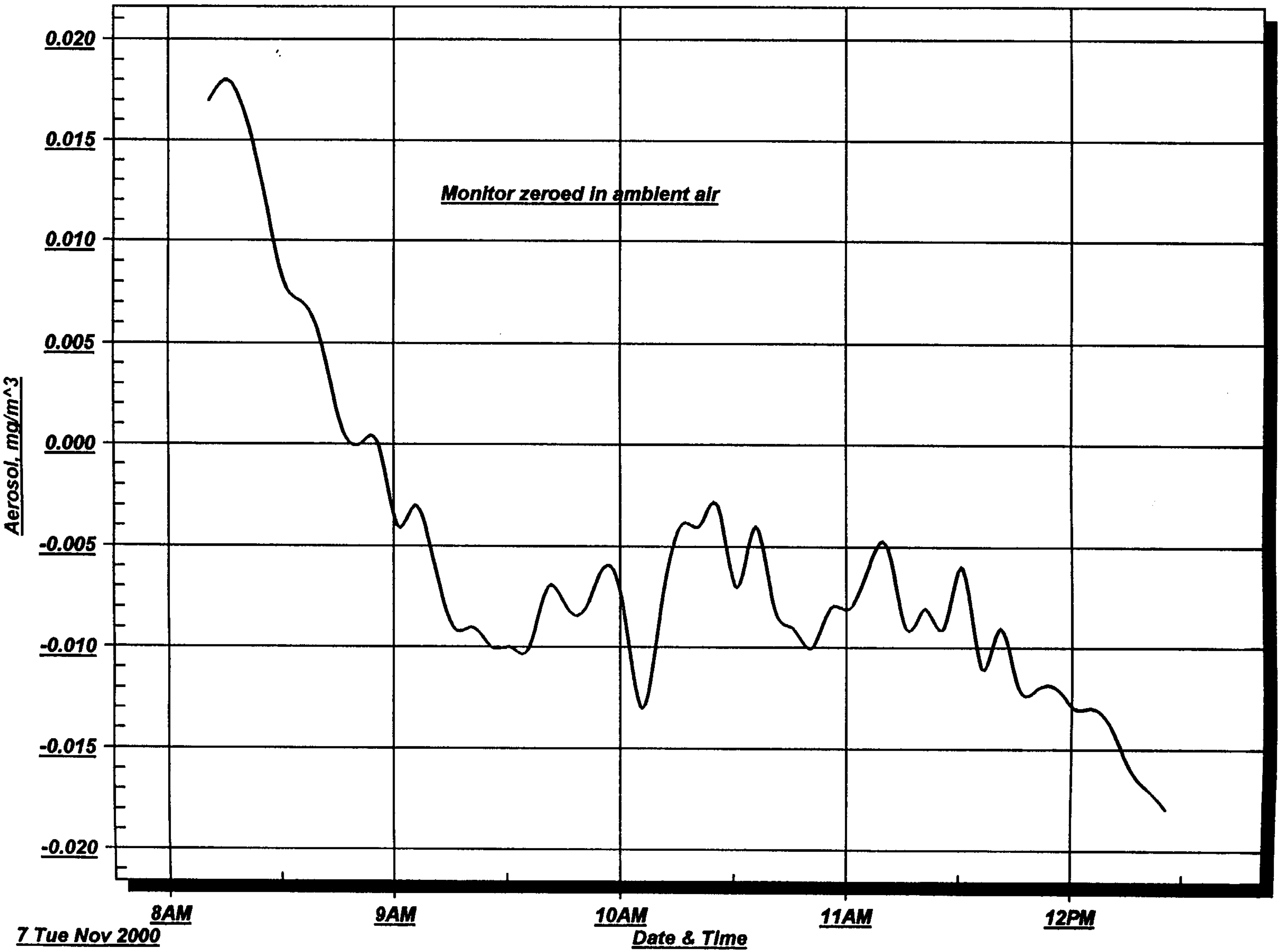
CONTINUED ON REVERSE SIDE

Current Graph: Pilot Plant SGS Dust Monitoring Summary
Start time: 08:05:51 11/07/2000 Stop time: 12:25:51 11/07/2000

Legend:	Aerosol
Channel:	Aerosol
(Units)	mg/m^3
Average:	-0.006
Lowest point:	-0.018
Time	12:25:51
Date	11/07/2000
Highest point:	0.018
Time	08:15:51
Date	11/07/2000
Log interval:	00:05:00
hh:mm:ss	

Pilot Plant SGS Dust)onitoring Summary

11/7/00



AIR MONITORING DATA SHEET
(DIRECT READING)

SITE: FMSS: Pilot	WEATHER CONDITIONS: Overcast, mild, SE wind	DATE: 11/8/00

PERSON PERFORMING MONITORING: R. Spillane

EMPLOYEES PRESENT:	HRS PRESENT:	EMPLOYEE'S COMPANY:	INSTRUMENT INFORMATION TYPE	SERIAL NO.
F. Nardone	7.2	F.E.S.	TSI Dust Trak	Coran 21763
J. Gomes	5.6	F.E.S.		
D. Paris	4.2	F.E.S.		
F. Rodes	6.8	F.E.S.		

INSTRUMENTS CALIBRATION YES [X] NO [ ]

PPE IN USE: See HWP 015

PROCESS: Soil processing

MONITORING DATA

LOCATION AND REMARKS	TIME	DUST (mg/m3)	OV (PPM)	LEL (%)	O_2 (%)	CO (ppm)	H2S (ppm)
Pilot Plant Bivitec separator	0949						
	↓						
See attached graph & summary sheet							
for dust levels info	↓						
	1524						

CONTINUED ON REVERSE SIDE

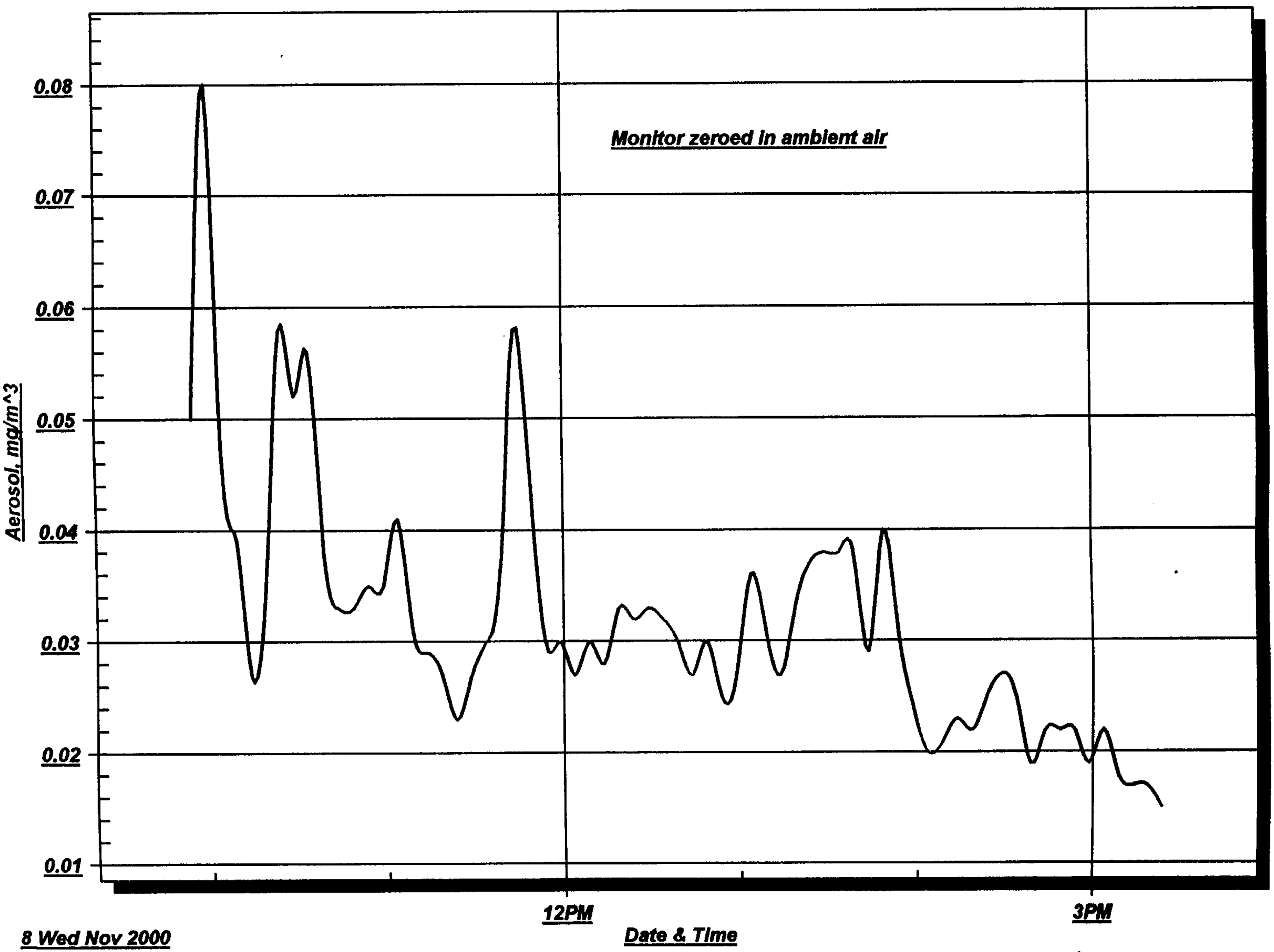
FUSRAP S-023 (09/22/94)

Current Graph: Pilot Plant Bivitec Dust Monitoring Summary
Start time: 09:48:47 11/08/2000 Stop time: 15:23:47 11/08/2000

Legend:	Aerosol
Channel: (Units)	Aerosol mg/m^3
Average:	0.032
Lowest point:	0.015
Time	15:23:47
Date	11/08/2000
Highest point:	0.080
Time	09:58:47
Date	11/08/2000
Log interval: hh:mm:ss	00:05:00

Pilot Plant Bivitec Dus) ʼonitoring Summary

11/8/00



APPENDIX J
NOISE MONITORING DATA

Attachment 1

Table 2
Location #1
Corner of Eccleston Place and West Magnolia Avenue.

Date	**Time**	**L_{90} (dBA)**	**L_{eq} (dBA)**	**Controlling Noise Sources**
31 Oct 2000	1330	58	65.4	L_{eq} – Passing Cars/Pilot Plant L_{90} – Rt 17 Traffic

Table 3
Location #2
West Central Avenue Halfway between Ramapo Avenue and Eccleston Place

Date	**Time**	**L_{90} (dBA)**	**L_{eq} (dBA)**	**Controlling Noise Sources**
31 Oct 2000	1355	61	70.7	L_{eq} - Passing Cars/Pilot Plant L_{90} – Rt. 17 Traffic
13 Nov 2000	1020	57	71	L_{eq} – Passing Cars/ Pilot Plant L_{90} - Rt. 17 Traffic
13 Nov 2000	1236	56	73.3	L_{eq} -Passing Cars/Pilot Plant L_{90} – Rt. 17 Traffic

Table 4
Location # 3
West Central Avenue – Halfway between Eccleston Place and Hergesell Avenue

Date	**Time**	**L_{90} (dBA)**	**L_{eq} (dBA)**	**Controlling Noise Sources**
20 Oct 2000	1106	61	72.1	L_{eq} – Passing Cars/Pilot Plant L_{90} – Rt. 17 Traffic
13 Nov 2000	1100	58	70	L_{eq} – Passing Cars/Pilot Plant L_{90} – Rt. 17 Traffic
15 Nov 2000	1115	61	70.6	L_{eq} – Passing Cars/Pilot Plant L_{90} – Rt. 17 Traffic

<u>Table 5</u>

Location # 4

West Central Avenue – Halfway between Hergesell Avenue and NJ Rt. 17

Date	Time	L_{90} (dBA)	L_{eq} (dBA)	Controlling Noise Sources
24 Oct 2000	1316	63	72.3	L_{eq} – Passing Cars/Pilot Plant L_{90} – Rt. 17 Traffic

Bechtel

Calculation Sheet

Originator: B Lenczuk | Date: 20 OCT 00 | Calc. No. | Rev. No.
Project: FMSS | Job No. | Checked | Date: 20 OCT. 00
Subject: NOISE SURVEY - COMMUNITY | Sheet No. 1

dBA — ANDERSON CHART METHOD

dBA	
58	J
59	J J
60	J
61	X X X X
62	X X X X X X
63	X
64	X X X
65	X X X X X
66	X X X X
67	X X
68	X
69	X X X X
70	X
71	X X X X X
72	X X
73	X X
74	X X X X
75	X X X X
76	X
77	X X
78	X X X
79	X X

L_{10} - 77 dBA
L_{50} - 68 dBA
L_{90} - 61 dBA
L_{eq} - 72.1 dBA

LOCATION # 3 ✓
W. CENTRAL BETWEEN ECCLESTON + Hengesell

- Temp - 16 °C / 61 °F
- Sunny w/ Limited cloud cover, Humidity 45 %
  WIND SPEED - 5 / MPH* VARIABLE
- START TIME 1106!

- AUTO TRAFFIC ~ 5-10 / MINUTE (CONTINUOUS)
- AIR TRAFFIC during SURVEY (2)
- Leaf Blower @ 173 W. CENTRAL (UP TO MEASUREMENT #45)
- PS+G Substation TRAILER MOUNTED TRANSFORMER UNITS w/ BLOWER UNITS (CONTINUOUS)
- LAWN MOWER START @ 173 W. CENTR… STARTED DURING MEASUREMENT #57.
- @ Readings below 61 dBA IT WAS POSSIBLE to HEAR SITE BACK-UP ALARMS

SFP-20768 Rev. (12/90) (ED-69) 7AZ4310/1/tt/FS

Bechtel

Calculation Sheet

Originator: BLENCZUK [illegible] | Date: | Calc. No.: | Rev. No.:
Project: | Job No.: | Checked: | Date: 3/[illegible]
Subject: [illegible] LESTON + MA[illegible] NOISE SURVEY | Sheet No.: 3

LOC #1 | START @ 1330

ANDERSON CHART METHOD

dBA	
55	
56	X
57	X X X
58	X X X
59	X X
60	X X X X X
61	X X
62	X X
63	X X
64	X
65	X
66	X
67	
68	
69	
70	
71	X
72	X
73	
74	
75	X
76	
77	
78	
79	
80	

NOISE
- AUTO(S)
- PLANES
- WIND N/2mph
- [illegible]
- RT. 17 TRAFFIC
- HUMIDITY 60%
- CLEAR SUNNY $\bar{c}$ SPORADIC CLOUD COVER
- TEMP 11°C/52°F

+ WASH UNIT STOPPED AFTER 4 1/2 minutes

L_{10} - 64 dBA
L_{50} - 60 dBA
L_{90} - 58 dBA
L_{eq} - 65.4 dBA

Calculation Sheet

Originator B. LEUCR Date ______ Calc. No. ______ Rev. No. ______
Project ______ Job No. ______ Checked ______ Date 13 NOV 00
Subject W-CENTRAL & HERGESELL Sheet No. 5

loc #3

dBA	ANDERSON CHART METHOD
55	D
56	
57	J J
58	J J J D D D
59	X J J D
60	X J J J J D
61	J J
62	J J
63	X J
64	X J
65	X X D D
66	X X X
67	D
68	X X X D
69	X X X
70	X X X X
71	X X X
72	X
73	X X X
74	X X
75	X X
76	
77	X X
78	X
79	X

START TIME - 1100 AM
CAR TRAFFIC
AIRCRAFT
RT 17 TRAFFIC
TEMP 46 °F / 8 °C
WIND 3 mph
OVERCAST

L_{90} - 58 dBA
L_{50} - 65 dBA
L_{10} - 75 dBA
L_{eq} - 70 dBA

Bechtel

Calculation Sheet

Originator: B. LENCZUK Date: ______ Calc. No.: ______ Rev. No.: ______
Project: FMSS Job No.: ______ Checked: ______ Date: 13 NOV 00
Subject: W-CENTRAL - ECCLESTON & RAMAPO Sheet No.: 6

LOC #2

dBA	ANDERSON CHART METHOD
52	J
53	
54	
55	J J
56	D J
57	D D J
58	D X
59	
60	
61	
62	D J X
63	J J
64	J X
65	X
66	J X J J J
67	X X J J J J
68	X X X X X X
69	X X X
70	X
71	X X
72	X X X X X X X
73	X
74	X X X X X X
75	X X
76	X X
77	X X
78	X

START TIME - 1020 AM
NOISE -
CAR TRAFFIC
AIRCRAFT
RT. 17 TRAFFIC
TEMP - 46°F/8°C
WIND 3 mph
OVERCAST

L_{90} - 57 dBA
L_{10} - 75 dBA
L_{50} - 68 dBA
L_{eq} - 71 dBA

Calculation Sheet

Originator B. LENCZ[illegible] Date ______ Calc. No. ______ Rev. No. ______

Project FMSS Job No. ______ Checked ______ Date 15 NOV 00

Subject W-CENTRAL & HERGASELL Sheet No. 7

Loc #3

dBA	ANDERSON CHART METHOD
55	
56	
57	
58	
59	J
60	J
61	J J J J J
62	X J J J J J J
63	X J J J J J
64	X X
65	X X X X
66	X X X
67	X X
68	X X
69	X X
70	X X X X X X X
71	X
72	X X X
73	X X X X
74	X X X
75	X X X X X
76	X
77	X
78	X

START TIME - 1115 AM

NOISE - CAR TRAFFIC

TEMP - 46 °F / 8 °C

WIND - NW @ 14 mph

MOSTLY CLOUDY

HUMIDITY 46%

L_{90} - 61 dBA

L_{10} - 75 dBA

L_{50} - 68 dBA

L_{eq} - 70.6 dBA

Bechtel

Calculation Sheet

Originator: B. LENCZ[illegible] Date: ______ Calc. No.: ______ Rev. No.: ______
Project: FMSS Job No.: ______ Checked: ______ Date: 13 NOV 00
Subject: W-CENTRAL Between RAMAPO + ECCLESTON Sheet No.: 8

loc # 2

dBA	ANDERSON CHART METHOD
52	X
53	
54	X
55	X
56	X X X X X
57	X X
58	X X
59	X X X
60	X
61	X X X X
62	X X
63	X X X
64	X X
65	X X
66	X X X
67	X X X
68	X X
69	X
70	X X X X
71	X X X X
72	X X
73	X X X
74	X X
75	X
76	X
77	X
78	X
82	X
85	X X

START TIME - 1236 AM

NOISE - AUTO TRAFFIC
OVERCAST
TEMP - 46°F/8°C
WIND 3mph

L_{90} - 56 dBA
L_{10} - 76 dBA
L_{50} - 66 dBA
L_{eq} - 73.3 dBA

SFP-20768 Rev. (12/90) (ED-69) 7AZ4310/1/tt/FS

Bechtel

Calculation Sheet

Originator: B. Lenczuk   Date: 24 OCT 00   Calc. No.:   Rev. No.:

Project: FMSS   Job No.:   Checked: Date: 24 OCT 00

Subject: NOISE SURVEY - Between Hergesell & Rt. 17   Sheet No. 2

LOCATION #4

ANDERSON CHART METHOD

START - @ 1316

NOISE FROM
• CARS / TR[illegible]

* WASH PLANT
[illegible]
MEASUREMENT
- 55

19°C / 66°F
WIND S/W @ 9mph
HUMIDITY 51%
CLOUD COVER - none

dBA						
55						
56						
57						
58						
59						
60	A					
61	J	X				
62	A					
63	A	X				
64	X	X	X	X		
65	X	X	X	X		
66	X	X	X	X		
67	X	X	X	X		
68	X					
69	X	X	X	X	X	
70	X	X	X	X	X	
71	X	X	X	X	X	X
72	X	X	X			
73	X	X	X			
74	X	X				
75	X	X	X	X	X	X
76	X	X	X	X	X	
77						
78	X					
79	X					
80	X					
81						
82						

L_{10} - 76 dBA
L_{50} - 70 dBA
L_{90} - 63 dBA
L_{eq} - 72.3 dBA

Bechtel

Calculation Sheet

Originator B LEAXDUC [illegible] Date ______ Calc. No. ______ Rev. No. ______

Project ______ Job No. ______ Checked ______ Date 31 OCT 00

Subject NOISE SURVEY W. CENTRAL [illegible] ECCLES [illegible] + [illegible] Sheet No. 4

LOC #2

ANDERSON CHART METHOD

dBA	
55	
56	
57	
58	J
59	X
60	X X X
61	X X X
62	X X X X J J J
63	X X X X
64	X J
65	X
66	X X
67	X X X X
68	X X X
69	X X J
70	
71	X X X X
72	X X X
73	X X X X X X
74	X X X X X
75	X X X X X X
76	X X
77	
78	
79	
80	

NOISE - CAR TRAFFIC, PLANES

WEATHER - CLEAR, SUNNY, SPORADIC [illegible]

START - @ 135[illegible]

- WIND - N/12 mph
- GUSTS - 20 mph, LEAVES/[illegible]
- HUMIDITY - 66%
- TEMP - 11°C/52°F

L_{90} - 61 dBA

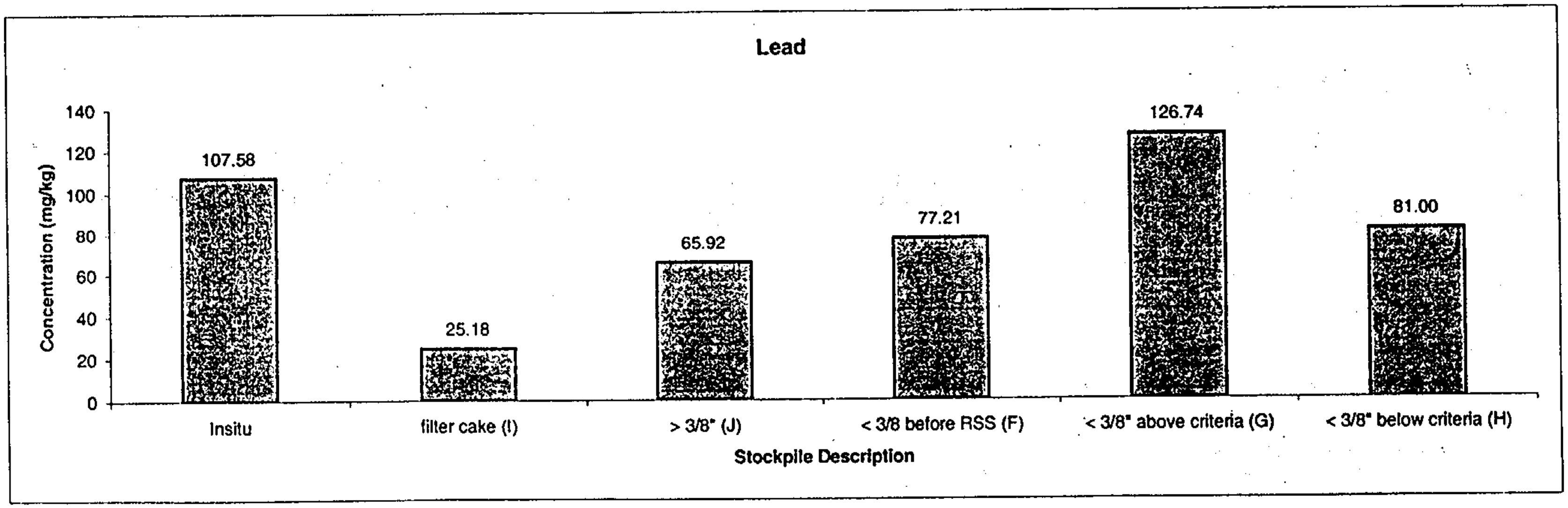
L_{50} - 68 dBA

L_{10} - 75 dBA

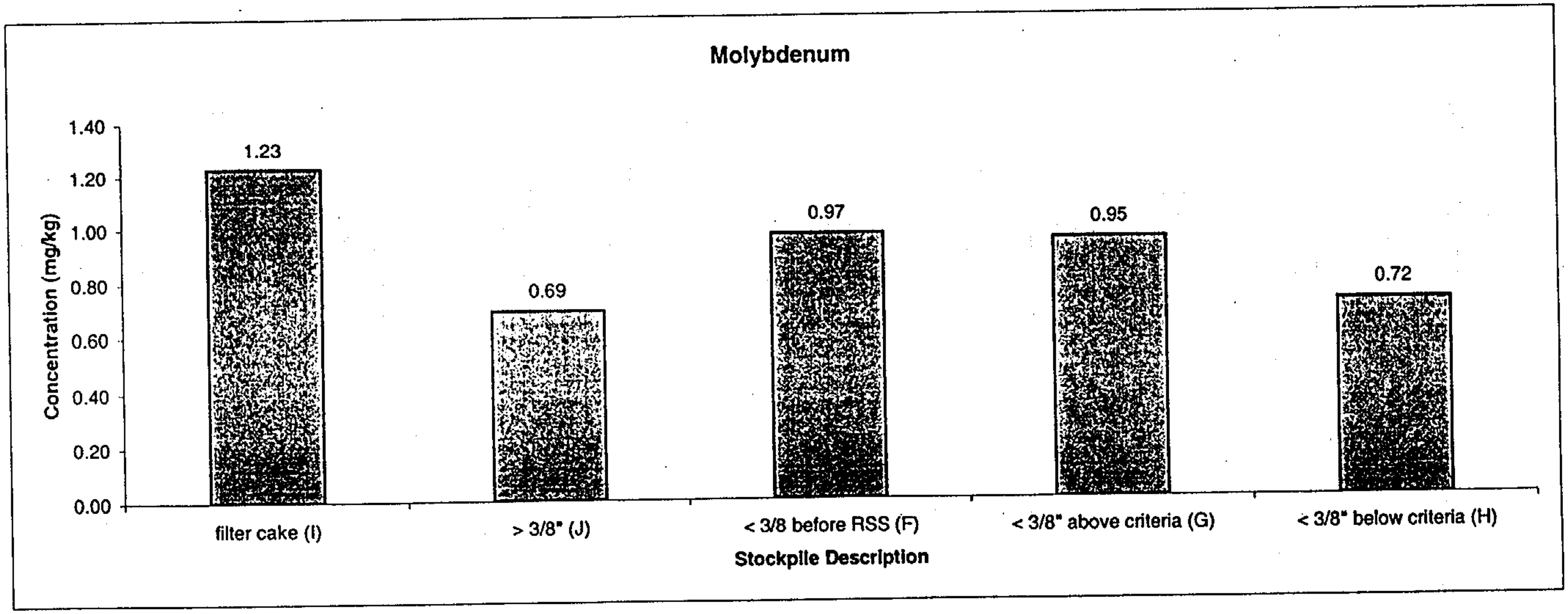
L_{eq} - 70.7 dBA

APPENDIX K
DISTRIBUTION OF CHEMICAL SPECIES

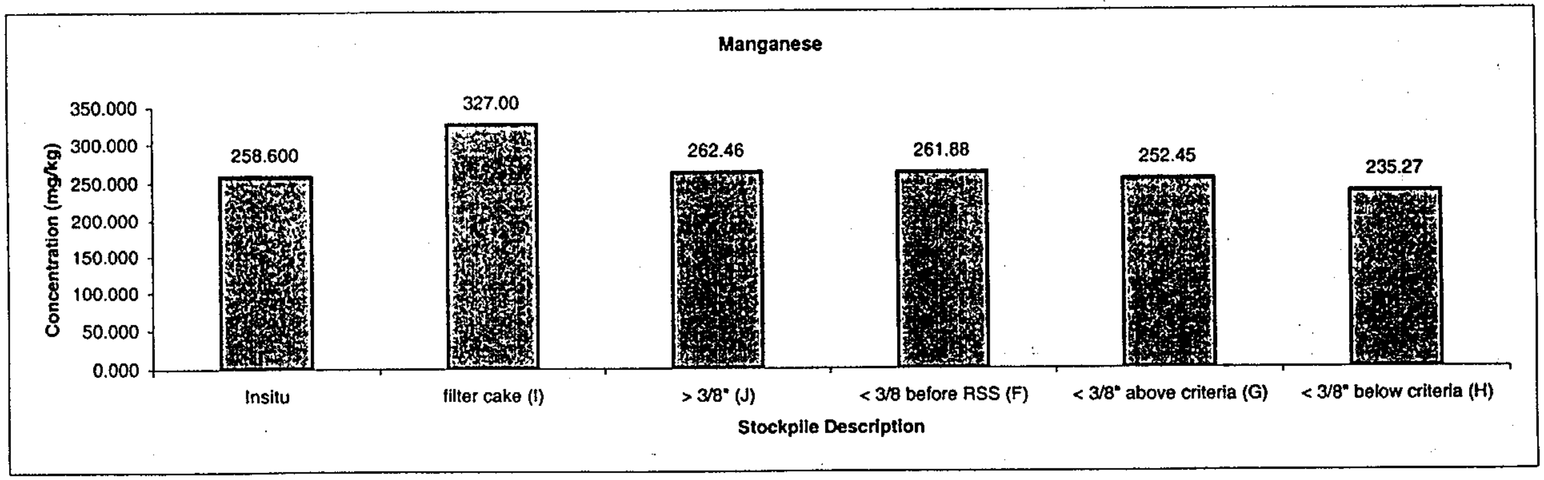
Stockpile Description	Total Samples Collected	Count of Samples with Detected Results	% Samples with Detected Results	Analyte Group	Analysis Name	Average Result (units vary)	various units	Average Result (mg/kg)	Standard Deviation	Direct Contact, Residential (mg/kg)	Direct Contact, Industrial (mg/kg)
Insitu	17	17	100.00	Metals	Lead, Total	107.576	mg/Kg	107.576	136.03	400	600
filter cake (I)	4	4	100	Metals	Lead, Total	25.175	mg/Kg	25.175	4.20	400	600
> 3/8" (J)	54	54	100	Metals	Lead, Total	65.924	mg/Kg	65.924	48.84	400	600
< 3/8 before RSS (F)	8	8	100	Metals	Lead, Total	77.213	mg/Kg	77.213	8.93	400	600
< 3/8" above criteria (G)	56	56	100	Metals	Lead, Total	126.743	mg/Kg	126.743	240.27	400	600
< 3/8" below criteria (H)	56	56	100	Metals	Lead, Total	80.998	mg/Kg	80.998	58.33	400	600



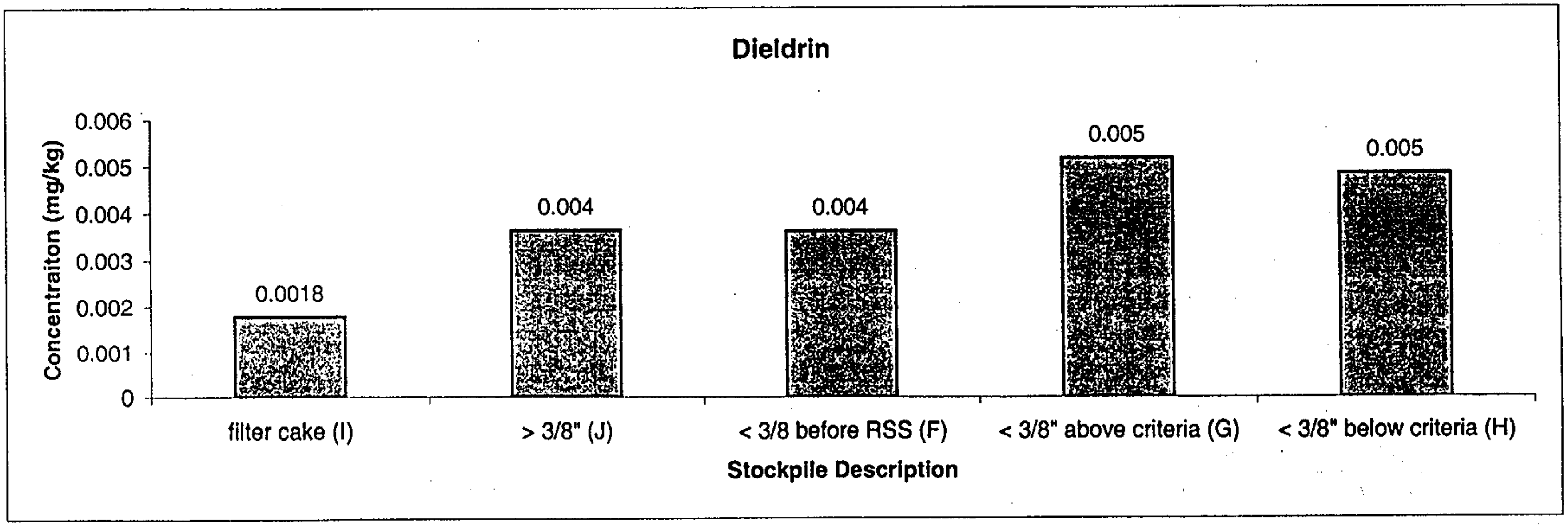
Stockpile Description	Total Samples Collected	Count of Samples with Detected Results	% Samples with Detected Results	Analyte Group	Analysis Name	Average Result (units vary)	various units	Average Result (mg/kg)	Standard Deviation	Direct Contact, Residential (mg/kg)	Direct Contact, Industrial (mg/kg)
filter cake (I)	4	4	100.00	Metals	Molybdenum, Total	1.23	mg/Kg	1.23	1.05		
> 3/8" (J)	54	54	100.00	Metals	Molybdenum, Total	0.69	mg/Kg	0.69	0.33		
< 3/8 before RSS (F)	8	8	100.00	Metals	Molybdenum, Total	0.97	mg/Kg	0.97	0.58		
< 3/8" above criteria (G)	56	56	100.00	Metals	Molybdenum, Total	0.95	mg/Kg	0.95	0.45		
< 3/8" below criteria (H)	56	56	100.00	Metals	Molybdenum, Total	0.72	mg/Kg	0.72	0.31		



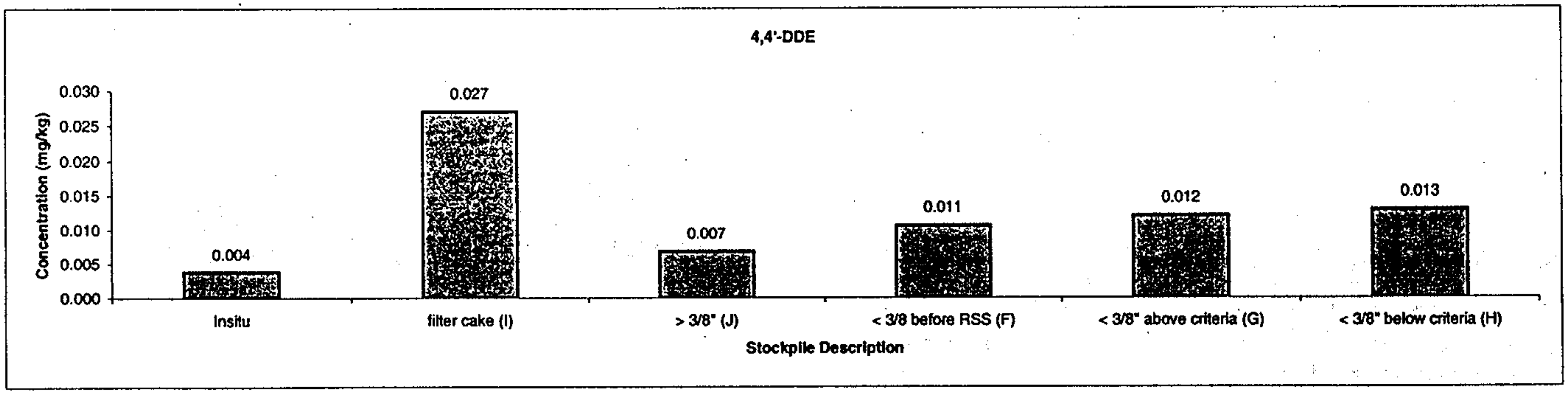
Stockpile Description	Total Samples Collected	Count of Samples with Detected Results	% Samples with Detected Results	Analyte Group	Analysis Name	Average Result (units vary)	various units	Average Result (mg/kg)	Standard Deviation	Direct Contact, Residential (mg/kg)	Direct Contact, Industrial (mg/kg)
Insitu	17	17	100.00	Metals	Manganese, Total	258.600	mg/Kg	258.600	183.15	14	270
filter cake (I)	4	4	100.00	Metals	Manganese, Total	327.00	mg/Kg	327.00	214.68		
> 3/8" (J)	54	54	100.00	Metals	Manganese, Total	262.46	mg/Kg	262.46	72.18		
< 3/8 before RSS (F)	8	8	100.00	Metals	Manganese, Total	261.88	mg/Kg	261.88	110.42		
< 3/8" above criteria (G)	56	56	100.00	Metals	Manganese, Total	252.45	mg/Kg	252.45	60.00		
< 3/8" below criteria (H)	56	56	100.00	Metals	Manganese, Total	235.27	mg/Kg	235.27	47.38		



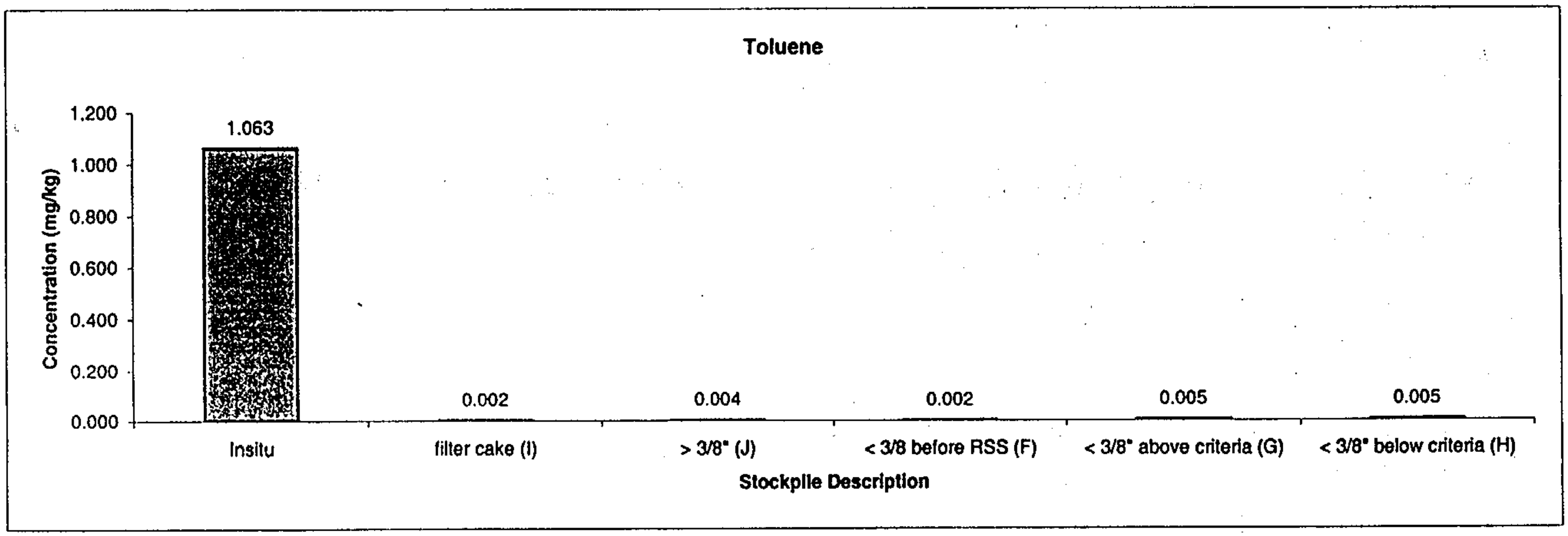
Stockpile Description	Total Samples Collected	Count of Samples with Detected Results	% Samples with Detected Results	Analyte Group	Analysis Name	Average Result (units vary)	various units	Average Result (mg/kg)	$(\frac{ug}{Kg})^2$ Standard Deviation	Direct Contact, Residential (mg/kg)	Direct Contact, Industrial (mg/kg)
filter cake (I)	4	3	75	Pesticides	Dieldrin	1.8	ug/Kg	0.0018	0.17	0.042	0.18
> 3/8" (J)	51	18	35.2941176	Pesticides	Dieldrin	3.631	ug/Kg	0.004	2.57	0.042	0.18
< 3/8 before RSS (F)	8	8	100	Pesticides	Dieldrin	3.600	ug/Kg	0.004	1.72	0.042	0.18
< 3/8" above criteria (G)	53	34	64.1509434	Pesticides	Dieldrin	5.135	ug/Kg	0.005	3.73	0.042	0.18
< 3/8" below criteria (H)	50	22	44	Pesticides	Dieldrin	4.800	ug/Kg	0.005	3.10	0.042	0.18



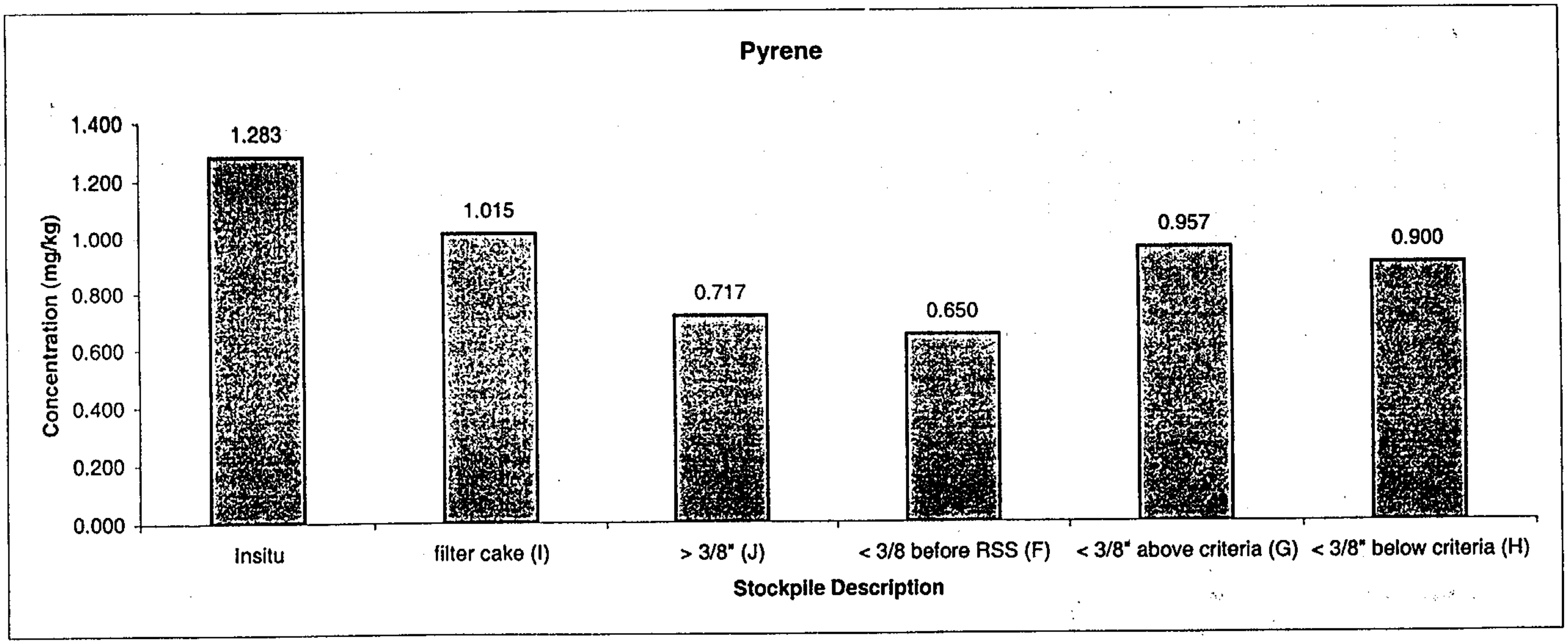
Stockpile Description	Total Samples Collected	Count of Samples with Detected Results	% Samples with Detected Results	Analyte Group	Analysis Name	Average Result (units vary)	various units	Average Result (mg/kg)	(ug/Kg)^2 Standard Deviation	Direct Contact, Residential (mg/kg)	Direct Contact, Industrial (mg/kg)
Insitu	8	8	100.00	Pesticides	4,4'-DDE	3.873	ug/Kg	0.004	2.01	2	9
filter cake (I)	4	3	75	Pesticides	4,4'-DDE	27	ug/Kg	0.027	9.85	2	9
> 3/8" (J)	51	22	43.1372549	Pesticides	4,4'-DDE	6.856	ug/Kg	0.007	5.69	2	9
< 3/8 before RSS (F)	8	7	87.5	Pesticides	4,4'-DDE	10.600	ug/Kg	0.011	3.78	2	9
< 3/8" above criteria (G)	53	37	69.81132075	Pesticides	4,4'-DDE	11.978	ug/Kg	0.012	5.70	2	9
< 3/8" below criteria (H)	50	19	38	Pesticides	4,4'-DDE	12.779	ug/Kg	0.013	6.90	2	9



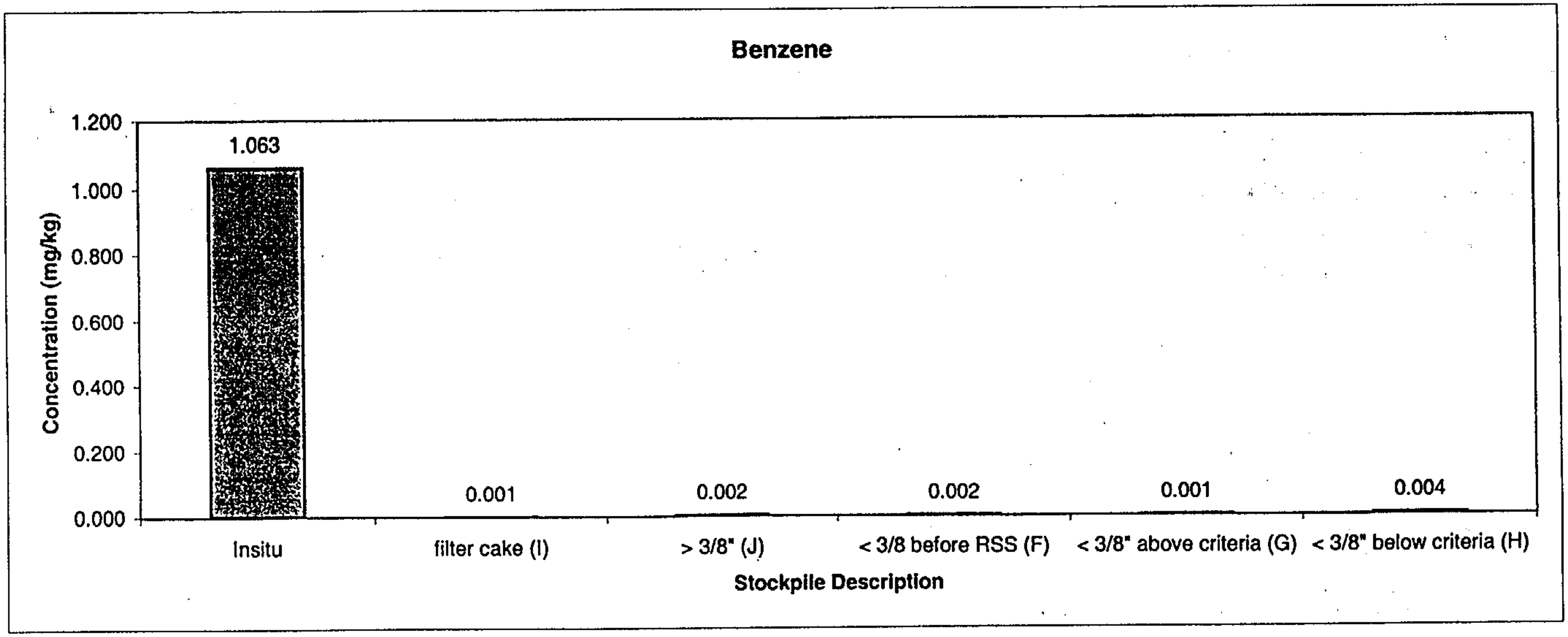
Stockpile Description	Total Samples Collected	Count of Samples with Detected Results	% Samples with Detected Results	Analyte Group	Analysis Name	Average Result (units vary)	various units	Average Result (mg/kg)	Standard Deviation	Direct Contact, Residential (mg/kg)	Direct Contact, Industrial (mg/kg)
Insitu	17	8	47.06	VOC	Toluene	1062.500	ug/Kg	1.063	606.93	410	1000
filter cake (I)	4	3	75.00	VOC	Toluene	2.33	ug/Kg	0.002	0.58	1000.00	1000.00
> 3/8" (J)	3	2	66.67	VOC	Toluene	3.50	ug/Kg	0.004	0.71	1000.00	1000.00
< 3/8 before RSS (F)	8	8	100.00	VOC	Toluene	1.50	ug/Kg	0.002	0.93	1000.00	1000.00
< 3/8" above criteria (G)	56	48	85.71	VOC	Toluene	4.87	ug/Kg	0.005	8.51	1000.00	1000.00
< 3/8" below criteria (H)	56	51	91.07	VOC	Toluene	4.99	ug/Kg	0.005	5.38	1000.00	1000.00



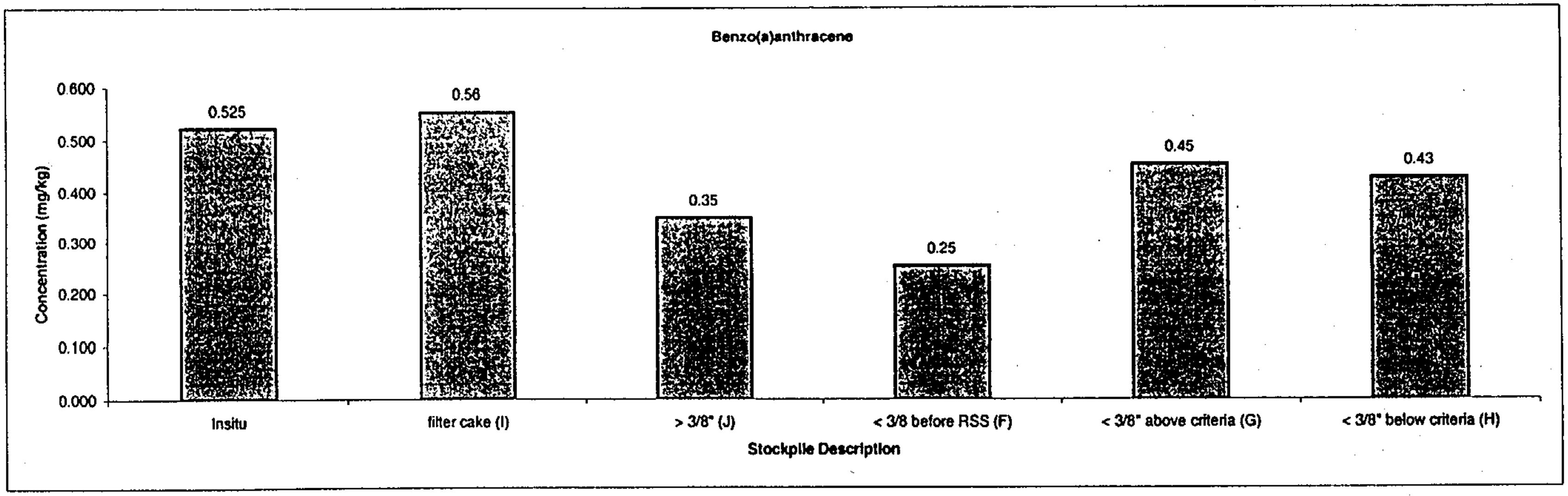
Stockpile Description	Total Samples Collected	Count of Samples with Detected Results	% Samples with Detected Results	Analyte Group	Analysis Name	Average Result (units vary)	various units	Average Result (mg/kg)	(ug/Kg)2 Standard Deviation	Direct Contact, Residential (mg/kg)	Direct Contact, Industrial (mg/kg)
Insitu	8	8	100.00	SVOC	Pyrene	1282.875	ug/Kg	1.283	2271.15	1700	10000
filter cake (I)	4	2	50	SVOC	Pyrene	1015	ug/Kg	1.015	120.21	1700	10000
> 3/8" (J)	51	51	100	SVOC	Pyrene	716.784	ug/Kg	0.717	1716.76	1700	10000
< 3/8 before RSS (F)	8	7	87.5	SVOC	Pyrene	650.000	ug/Kg	0.650	431.35	1700	10000
< 3/8" above criteria (G)	50	50	100	SVOC	Pyrene	957.000	ug/Kg	0.957	1700.31	1700	10000
< 3/8" below criteria (H)	53	51	96.2264151	SVOC	Pyrene	900.196	ug/Kg	0.900	688.24	1700	10000



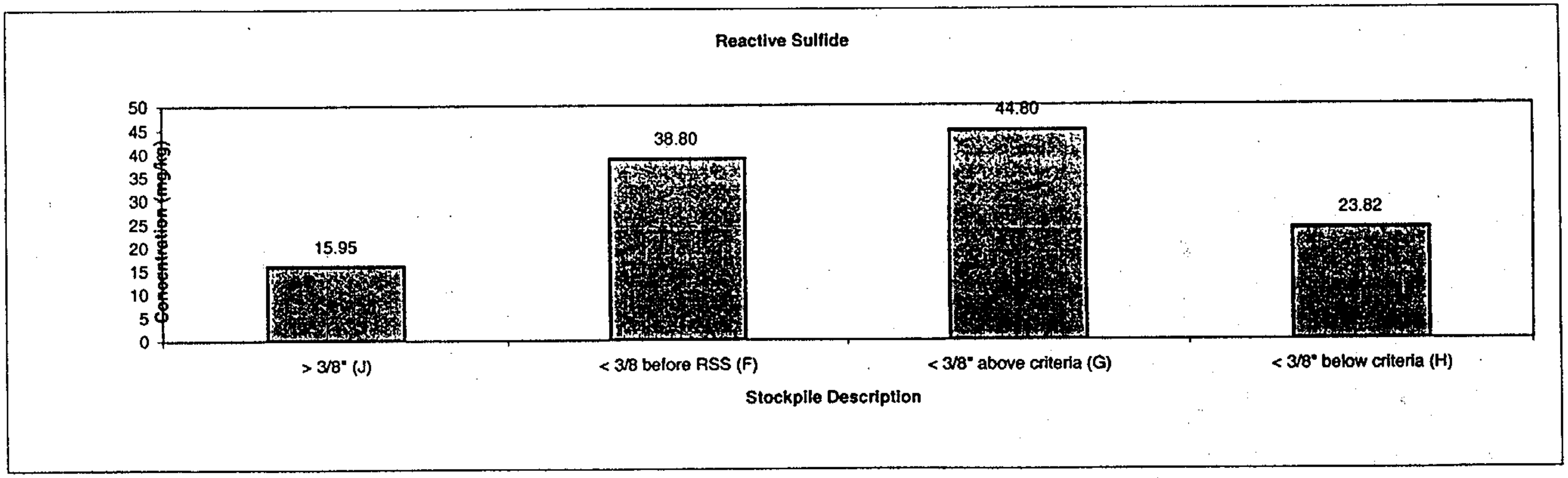
Stockpile Description	Total Samples Collected	Count of Samples with Detected Results	% Samples with Detected Results	Analyte Group	Analysis Name	Average Result (units vary)	various units	Average Result (mg/kg)	(ug/Kg) Standard Deviation	Direct Contact, Residential (mg/kg)	Direct Contact, Industrial (mg/kg)
Insitu	17	8	47.06	VOC	Benzene	1062.500	UG/KG	1.063	606.93	11	46
filter cake (I)	8	7	87.50	VOC	Benzene	0.93	ug/Kg	0.001	0.15	3.00	13.00
> 3/8" (J)	56	45	80.36	VOC	Benzene	2.40	ug/Kg	0.002	2.12	3.00	13.00
< 3/8 before RSS (F)	56	44	78.57	VOC	Benzene	1.81	ug/Kg	0.002	1.92	3.00	13.00
< 3/8" above criteria (G)	4	3	75.00	VOC	Benzene	0.70	ug/Kg	0.001	0.26	3.00	13.00
< 3/8" below criteria (H)	3	2	66.67	VOC	Benzene	3.50	ug/Kg	0.004	0.71	3.00	13.00



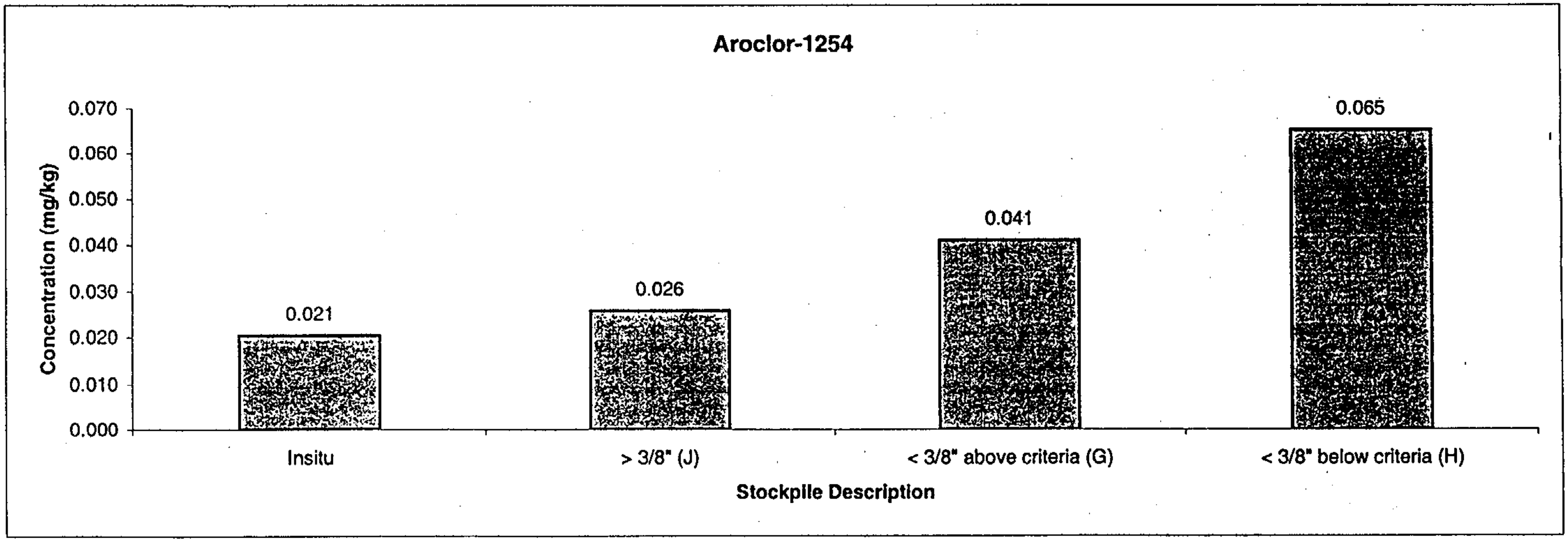
Stockpile Description	Total Samples Collected	Count of Samples with Detected Results	% Samples with Detected Results	Analyte Group	Analysis Name	Average Result (units vary)	various units	Average Result (mg/kg)	(ug/Kg)[2] Standard Deviation	Direct Contact, Residential (mg/kg)	Direct Contact, Industrial (mg/kg)
Insitu	8	8	100.00	SVOC	Benzo(a)anthracene	524.500	ug/Kg	0.525	855.58	0.66	0.66
filter cake (I)	4	2	50.00	SVOC	Benzo(a)anthracene	555.00	ug/Kg	0.56	77.78	0.90	4.00
> 3/8" (J)	51	50	98.04	SVOC	Benzo(a)anthracene	350.02	ug/Kg	0.35	934.96	0.90	4.00
< 3/8 before RSS (F)	8	7	87.50	SVOC	Benzo(a)anthracene	254.29	ug/Kg	0.25	217.63	0.90	4.00
< 3/8" above criteria (G)	50	49	98.00	SVOC	Benzo(a)anthracene	452.57	ug/Kg	0.45	919.27	0.90	4.00
< 3/8" below criteria (H)	53	53	100.00	SVOC	Benzo(a)anthracene	426.43	ug/Kg	0.43	350.62	0.90	4.00



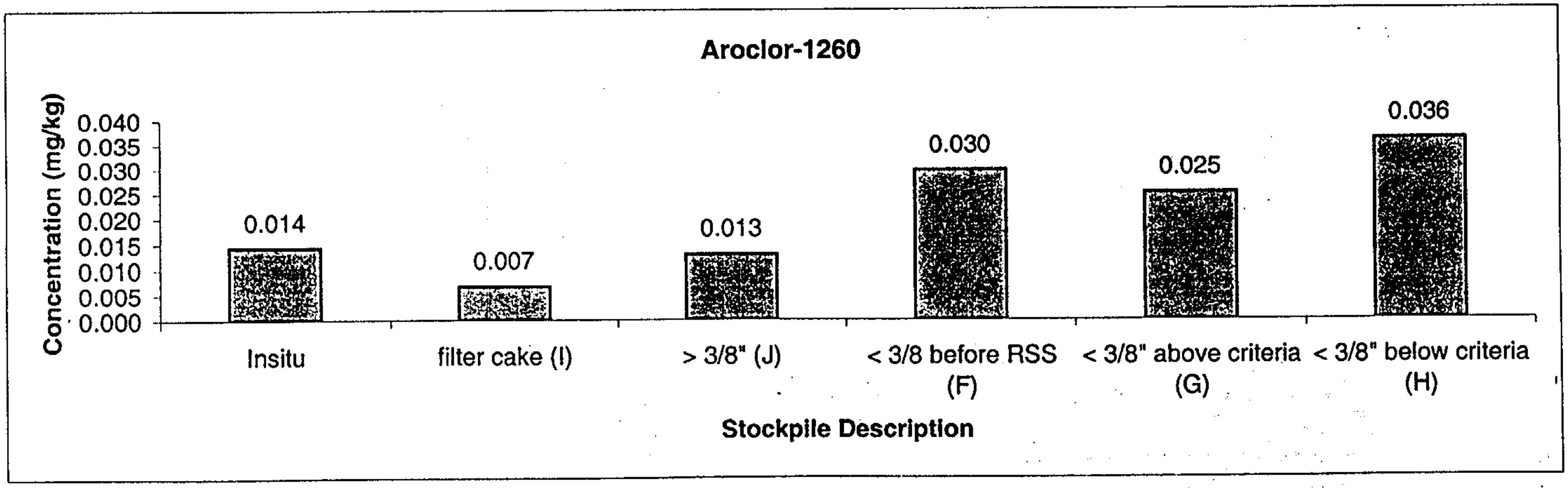
Stockpile Description	Total Samples Collected	Count of Samples with Detected Results	% Samples with Detected Results	Analyte Group	Analysis Name	Average Result (units vary)	various units	Average Result (mg/kg)	Standard Deviation	Direct Contact, Residential (mg/kg)	Direct Contact, Industrial (mg/kg)
> 3/8" (J)	51	2	3.9215686	Char	Sulfide, Reactive	15.95	mg/Kg	15.950	0.07	N/A	N/A
< 3/8 before RSS (F)	1	1	100	Char	Sulfide, Reactive	38.80	mg/Kg	38.800	---	N/A	N/A
< 3/8" above criteria (G)	50	2	4	Char	Sulfide, Reactive	44.80	mg/Kg	44.800	40.87	N/A	N/A
< 3/8" below criteria (H)	53	5	9.4339623	Char	Sulfide, Reactive	23.82	mg/Kg	23.820	11.12	N/A	N/A



Stockpile Description	Total Samples Collected	Count of Samples with Detected Results	% Samples with Detected Results	Analyte Group	Analysis Name	Average Result (units vary)	various units	(ug/Kg)² Standard Deviation	Average Result (mg/kg)	Direct Contact, Residential (mg/kg)	Direct Contact, Industrial (mg/kg)
Insitu	10	2	20.00	PCBs	Aroclor-1254	20.50	ug/Kg	6.36	0.021	0.49	2
> 3/8" (J)	51	15	29.41	PCBs	Aroclor-1254	25.88	ug/Kg	30.73	0.026	0.49	2
< 3/8" above criteria (G)	50	22	44.00	PCBs	Aroclor-1254	41.09	ug/Kg	31.08	0.041	0.49	2
< 3/8" below criteria (H)	53	40	75.47	PCBs	Aroclor-1254	65.16	ug/Kg	169.74	0.065	0.49	2



Stockpile Description	Total Samples Collected	Count of Samples with Detected Results	% Samples with Detected Results	Analyte Group	Analysis Name	Average Result (units vary)	various units	(ug/Kg)^2 Standard Deviation	Average Result (mg/kg)	Direct Contact, Residential (mg/kg)	Direct Contact, Industrial (mg/kg)
Insitu	10	7	70.00	PCBs	Aroclor-1260	14.34	ug/Kg	7.06	0.014	0.49	2
filter cake (I)	2	2	100.00	PCBs	Aroclor-1260	6.75	ug/Kg	1.63	0.007	0.49	2
> 3/8" (J)	51	25	49.02	PCBs	Aroclor-1260	13.02	ug/Kg	10.05	0.013	0.49	2
< 3/8 before RSS (F)	7	7	100.00	PCBs	Aroclor-1260	29.71	ug/Kg	22.02	0.030	0.49	2
< 3/8" above criteria (G)	50	37	74.00	PCBs	Aroclor-1260	25.21	ug/Kg	22.29	0.025	0.49	2
< 3/8" below criteria (H)	53	43	81.13	PCBs	Aroclor-1260	35.88	ug/Kg	39.37	0.036	0.49	2



APPENDIX L
COST ANALYSIS CALCULATIONS

Client: USACE	Location: Maywood Superfund Site	Est. No.	J.O. No.:	08575- 0611
Subject: Sample Cost Comparison Calculation		Date: 04/11/01	By:	Kevin F. Donnelly
Pilot Demonstration		Checked	By	Jeff Peterson
Based On: Pilot Demonstration Results		Revised 12/03/02	By	Kevin F. Donnelly

General Assumptions:

	Qty	units	
Total Construction Volume	360,911	cy	ref: Calc #0402-030
Bulk Contaminated Soil	300,850	cy	
Bulk "Clean" Soil	60,061	cy	
Construction Season Duration	9	months	
Avg Construction Volume per Season	50,000	cy	
Avg Construction Volume per Day	300	cy	
Weather/operations delays	0%	Weather Delays	
Assume weather delays are accounted for in average construction volume			
T&D Costs (assumes transport via rail and loadout cost)			
11(e)2 disposal facility	$233	per cy	
Subtitle "C" landfill	$203	per cy	

Base Case

Assumptions:

1 All contaminated material is disposed of at licensed 11(e)2 disposal facility
2 Field screening can only recover a fraction of the "clean" soil
3 Recovered "clean" material is left on site

4 Recovery fraction of "clean" soil	25%	15,015	cy
Total Construction Volume		360,911	cy
Volume for T&D		345,896	cy
Cost for T&D		$80,596,541	
Unit Cost		$233	per cy

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Processing Case - GSS & RSS **9 - month construction season**

Assumptions: **100% - reuse**

1 Base Case T&D Volume applies 345,896 cy

2 A percentage of material will not be processed and will be disposed as rad waste 70% 242,127 cy
- Highly contaminated material
- Pond sludge
- Special waste (rad and chemical mixed)
- Debris (drums, etc)
- Too wet

3 Material Available for processing 103,769 cy

4 Constraints
- Fiscal Constraints 50,000 max cy/yr
- Operational Constraints 423 max cy/day

5 Construction season 9 months
- 4.2 weeks/month
- 189 days/construction season

6 Calculated Construction Duration

Fiscal Constrained		Process Constrained	Construction Constrained
6.9	seasons	246 min days	818 min days
818	min days		

Fiscal Constrained

Duration = 818 days Avg Process Rate = 126.9 cy /day

7 Daily Processing Cost

	Cost	**Rate**	
Gravel Separation System	$5,529	750 cy/day	
Radiological Sorting System	$6,976	325 cy/day	
Material Handling & Oversight	$3,600		
Total Daily Processing Cost	$16,106	423 cy/day	(lesser of GSS or RSS x (1+ coarse fraction)

8 Total Processing Cost $13,169,887
P = $127 per yd

9 Volume Recovery

Coarse fraction on total processed	30%	31,131	cy
Remaining volume to RSS		72,638	cy
Recovery at RSS	32%	23,244	cy
Total Volume Recovery		54,375	cy

10 Recovered volume for reuse on-site 100% 54,375 cy

11 Volume to Alternative Disposal 0 cy

12 Cost for Unused soil to Alternative Disposal $-

13 Volume to Rad Disposal 291,521

14 Cost for Rad Disposal $67,926,764

15 Backfill credit on reuse $1.02 per cy $(55,542)

16 Total Cost $81,041,109

17 Unit Cost y = $234 per cy

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Based On: Pilot Demonstration Results		Revised 12/03/02	By	Kevin F. Donnelly

Processing Case - GSS Only — **9 month construction season**

Assumptions: — **100% reuse**

1 Base Case T&D Volume applies — 345,896 cy

2 A percentage of material will not be processed and will be disposed as rad waste — 40% — 138,358 cy
- Highly contaminated material
- Pond sludge
- Special waste (rad and chemical mixed)
- Debris (drums, etc)

3 Material Available for processing — 207,538 cy

4 Construction constraints
- Fiscal Constraints — 50,000 max cy/season
- Operational Constraints — 500 max cy/day

5 Construction season — 9 months
- 4.2 weeks/month
- 189 days/construction season

6 Calculated Construction Duration

Fiscal Constrained		Process Constrained	Construction Constrained
6.9	seasons	277 min days	692 min days
692	min days		

Fiscal Constrained

Duration = 692 days — Avg Process Rate = 300.0 Cy /day

7 Daily Processing Cost	**Cost**	**Rate**
Gravel Separation System	$5,529	750 cy
Radiological Sorting System		
Material Handling & Oversight	$3,600	
Total Daily Processing Cost	$9,129	750 cy

8 Total Processing Cost — $6,315,634
P = $30 per yd

9 Volume Recovery

Coarse fraction on total processed	30%	62,261 cy
Remaining volume to RSS		145,276 cy
Recovery at RSS	0%	0 cy
Total Volume Recovery		62,261 cy

10	Recovered volume for reuse on-site	100%	62,261 cy
11	Volume to Alternative Disposal		0 cy
12	Cost for Unused soil to Alternative Disposal		$-
13	Volume to Rad Disposal		283,635
14	Cost for Rad Disposal		$66,089,163
15	Backfill credit on reuse	$1.02 per cy	$(63,598)
16	Total Cost		$72,341,200
17	Unit Cost	y =	$209 per cy

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$$\textbf{Total Unit Cost} = \frac{\text{Process Cost + Rad Disposal Cost + Alternative Disposal Cost - Backfill Credit}}{\text{Total Construction Volume}}$$

Where

y = Total Unit Cost

V = Total Construction Volume

a = Percent of soil that can not be processed

R = Percent of processed soil recovered as below criteria

r = Percent of recovered soil that can be reused on site

P = Process cost per cubic yard

Dr = Disposal cost per cubic yard for rad contaminated soils

Da = Disposal cost per cubic yard for non-rad contaminated soils

Bc = Credit per cubic yard on backfill for volume of soil reused on site

If the system is operated at maximum capacity, then P is a constant and is given by

$$P = \frac{\text{Daily Cost to Operate System}}{\text{Daily Soil Throughput}}$$

Process Cost Factor = (1 - a) x V x P

Rad Disposal Factor = [a + (1 - a) (1 - R)] x V x Dr

Alternative Disposal Factor = (1 - r) x [(1 - a) x R x V] x Da

Backfill Credit = r x [(1 - a) x R x V] x Bc

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Unit Cost for Radiological Soil Disposal (Dr) = Cost for loading Railcars + Rail Transportation + Disposal Cost

Transportation & Disposal = $208 per cubic yard @ 1.4 tons per cy

Loadout Cost

6	cars per day @	107 tons per car	=	642	tons per day
$11,468	per day of loadout		=	$17.86	per ton loaded
			=	$25.01	per cy loaded
Dr =	208 + 25 =	$233 per cubic yard			

Unit Cost for Alternativel Soil Disposal (Da) = Cost for loading Railcars + Rail Transportation + Disposal Cost

Transportation & Disposal = $178 per cubic yard @ 1.4 tons per cy

Loadout Cost

Same as for radiological soils above

Da = 178 + 25 = $203 per cubic yard

Backfill Credit (Bc) = Cost of Commercial Backfill - handling cost of reuse fill - sampling costs

Credits

$15.08 per cy, common fill, delivered — $10.77 per ton (avg. based on competitive bids)

$0.24 sampling cost of off-site fill based on 1 sample per 5,000 cy

Costs

Material Blending (Assume 50/50 gravel – soil mix)

$0.55 Per cy processing cost — Equipment & Operator $110 per hour; Blending Rate 200 cy per hour

Handling cost of re-use fill $1.83 per cy

Assume: Teamster and truck $1,316 per 10hr day
(based site cost history) $131.60 per hr
Operator to load truck included in Material Handling costs of Processing
10 hour operation, 10 min turn-around from Process Plant to reuse location on MISS, 12 cy/trip
6 trips/hr — 12 cy/trip — 72 cy/hr

Sampling costs: 1 sample per 100 cy — $1,192 per sample
$12 cy

Bc = (15.08 + 0.24) – (1.83 + 12+0.55) = $1.02 Per cubic yard of reuse soil

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Material Handling & Oversight Costs

Qty	Position	
	Task Manager	$200.00
0.25	Operations Supervisor	$800.00
1	Sampling Technician	$375.00
0.5	QC Inspector	$200.00
0.25	Operators	$1,073.72
2	John Deere 744 E, Case 921 B (5 Yard Bucket)	$386.67
2	Rad/H&S Technician	$565.00
1		

Total Material Management & Process Oversight Cost **$3,600.39** per day (avg.)

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Based On: Pilot Demonstration Results		Revised 12/03/02	By	Kevin F. Donnelly

Gravel Separation System "GSS" & Rinse Unit - Daily Operation Costs

Manpower:

Project Manager/ Technical Support	$621.00
1 Supervisior + Per Diem	$839.50
2 Operators	$1,139.10
3 Laborers	$1,287.40
Subtotal Labor	**$3,887.00**

Equipment, Materials, Maintenance & Misc:

Rinse Water Clarifier and Treatment	$670.00
Man Lifts (Scissor)	$158.00
Pumps and Misc support	$114.00
1 Frac Tank	$50.00
Floc	$200.00
Maintenance of GSS & Rinse Unit + Misc	$450.00
Note: Daily maintenance cost is based on down time data collected during pilot operation as well as future processing maintenance	
Subtotal Equipment	**$1,642.00**
Total Manpower & Equip	**$5,529.00**
Daily Cost Per Ton based on Processing 400 c.yd* 1.3 ton/c.yd	**$10.63**
Processing Cost per Cubic Yard	**$13.82**

Further Notes:

1) Franklin processing cost does not include loading,material handling, pre-conditioning of excavated material nor transporting to the GSS

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Radiological Sorting System - Daily Operation Cost

ASSUMPTIONS:

9 operational months per year

20 operational days per month

Capital Cost per Segmented Gate System		$1,000,000		
Number of systems required		1	@ 325 cy/day	325 cy/day
SGS Capital Cost		$ 1,000,000		
Initial Capital Recovery	0%	$ -		
Project Duration		7	years	(assume equals capital recovery period)
Interest Rate		10%	annual	
Annual Maintenance per system		$15,000	annual	(personal communication between Joe Kimbrell, Eberline, and Kevin Donnelly, S&W, 2 Apr 01)
Annual Maintenance		$15,000		
Annual Capital Recovery		$207,120		
Subtotal Equipment Cost		$222,120	annually	
		$ 1,234	daily	

1 Crews

Labor:	Per System	Qty	$/hr	hrs/day	$/day	per diem	$/day
Oversight		1	106	7	$ 742		
Supervisor		1	100	10	$ 1,000	$ 145	
SGS Operators	2	2	84	10	$ 1,680	$ 290	
Craft Operators	2	2	70	10	$ 1,400		
					$ 4,822	$ 435	$ 5,257

Initial Mobilization	$ 114,095		(based on Pilot Demonstration cost history)	
Final Demobilization	$ 53,800		(based on Pilot Demonstration cost history)	
4-End of Season Demob	$ 42,550	$ 170,200	(2 - crews, 2 week duration plus travel)	
4-Beginning Of Season Mob	$ 24,650	$ 98,600	(2 - crews, 1 week duration plus travel)	
Total		$ 436,695		$ 485 Day Rate

Summary - Order of Magnitude Cost Estimate

Day Rate for SGS Full Scale Application	Day Rate
Equip Cost	$ 1,234
Labor	$ 5,257
Mob-Demob	$ 485
	$ 6,976 Total