"M.S. Bonner" <batco@c-gate.net> on 06/13/2000 04:34:14 PM

To: "Caleb Dana" <ecosys@earthlink.net>, Chris Hawkins/HW/OPC/DEQ@DEQ, "Earl Alley" <earl@ra.msstate.edu>, cjordan@herc.com, "frank7" <frank7@gateway.net>, "Timothy D. Hassett" <thassett1@herc.com>, Tony Russell/HW/OPC/DEQ@DEQ

cc:

Subject: Update on Dioxathion/ Hercules Hattiesburg Project.

Today I received Official word from Aldrich Chemical Co. that they have received our purchase order for cis and trans dioxathion and dioxenethion. They have ordered the necessary starting materials and should have material for us to confirm purity within 10 to 12 weeks.

We should then be able to perform necessary MDL studies, decide on a method or methods then proceed with the site investigation.

If you have any questions or comments please let me here from you.

 - att1.htm

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
James I. Palmer, Jr., Executive Director

February 1, 2000

FILE COPY

Mr. Timothy D. Hasset
Hercules Incorporated
Hercules Plaza
1313 North Market Street
Wilmington, DE 19894-0001

Re: Hercules, Inc.
Proposed Groundwater Monitoring Well Locations
Site Investigation Work Plan, February 16, 1999
Letter dated December 27, 1999
Hattiesburg, MS

Dear Mr. Hasset:

The Mississippi Department of Environmental Quality (MDEQ) has completed its review of the above referenced document. The Revised Task III Assessment Plan for the proposed changes in the locations of Monitoring Wells MW – 8 and MW - 9 has been approved. As you may be aware, MDEQ is currently working with the adjacent property owner, Zeon Chemicals, Inc., concerning environmental conditions on that site. In an effort to better understand the hydrogeologic conditions that are present beneath both the Hercules and Zeon facilities, MDEQ requests that Hercules coordinate efforts with Zeon regarding establishing a common reference point for groundwater elevation measurements for the two sites.

If you have any questions or comments, you may contact Mr. Chris Hawkins at (601) 961-5775.

Sincerely,

Jere "Trey" Hess, P.E.
MDEQ - Superfund Branch

K:\Shared\Brownfields\CHawkins\Hercules\February 1, 2000.doc

OFFICE OF POLLUTION CONTROL
P.O. Box 10385 Jackson, MS 39289.0385 Phone 601.961.5171 Fax 601.354.6612

HERCULES

Hercules Incorporated
Hercules Plaza
1313 North Market Street
Wilmington, DE 19894-0001
(302) 594-5000
www.herc.com

December 31, 1999

VIA FAX 601-961-5300
Mr. Chris Hawkins
EIT- Office of Environmental Quality
PO Box 10385
Mississippi Department of Environmental Quality
Jackson, Ms. 39289-0385

RE: Hercules Hattiesburg, Ms. - Dioxathion Investigation

Dear Mr. Hawkins:

First, I would like to thank you for meeting with Hercules Incorporated earlier this month. Secondly, I apologize for not getting this letter out sooner but, as you are aware, after our meeting Dr. Alley and Frank Carlin have been sharing technical information and working on a modified approach that would expedite the process in obtaining the appropriate data.

The following are the highlights of the meeting conducted on December 1, 1999 between Hercules/Bonner Analytical and Mississippi Department of Environmental Quality (MsDEQ) and Dr. Earl Alley - Mississippi State University (MSU). Hercules kicked off the meeting with a restatement of the project mission, which is to determine the following objectives; whether dioxathion has migrated off-site and identify and delineate source areas of dioxathion. Once these objectives have been met Hercules can obtain an "Industrial Grade Order" which is in essence a form of a deed restriction, from MSDEQ. Hercules then summarized the work performed to date, which includes; development of an analytical protocol for dioxathion in conjunction with Dr. Lane - MSU, development of a workplan to accomplish the stated objectives, and the execution of the workplan. The initial phase of the workplan was to install several piezometers to provide a basis for selecting the installation of groundwater monitoring wells, and collect groundwater samples from existing wells, and analyze them for dioxathion using the agreed upon protocol and a common reference standard. Hercules executed these tasks and then, compared Hercules' data (Bonner Analytical) with MSU's data and the agreement between both labs was poor.

This resulted in both labs revisiting the reference standard and the protocol used. Bonner Analytical ran a series of experiments to identify the source of the discrepancy. These experiments are summarized in "Dioxathion Special Study," Bonner Analytical and Testing Company. MSU purchased a reference standard from National Institute of Standards and Technology and ran a set of analyses in which the results were still in poor agreement. We understand that MSU then brought Dr. Earl Alley to review the data and he determined that there were problems with both the method and the standard that need to be addressed and Hercules agreed and we scheduled the meeting.

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The analytical problems can be summarized as follows: the available reference standard is neither consistent nor stable resulting in differing ratios of the cis and trans isomer; and the trans isomer degrades thermally degrades using GC/MS to dioxenethiol. At the conclusion of the meeting, the following action items were agreed to between Hercules and MDEQ:

1) Explore feasibility of Liquid Chromotgoagrhy/ Ultraviolet detection (LC/UV)

2) Obtain standards for the cis and trans isomers of dioxathion and dioxenethiol.

3) Obtain real work samples to test methodology

4) Research literature to obtain a risk based number in groundwater for dioxathion.

5) Conduct a conference call between all parties on January 11, 2000 to review status.

After the meeting, Hercules contacted MsDEQ to discuss a site investigation approach which would focus only on the cis and trans isomers of dioxathion. Hercules believes that this approach will meet the MsDEQ's objectives and save time and resources and would like to continue discussions with MsDEQ and MSU. Please contact me if you have any questions regarding this letter at (302) 594-7656.

Respectfully,

Timothy D. Hassett
Staff Environmental Engineer
Hercules Incorporated

Hawkins

CC: C. S. Jordan - Hercules Hattiesburg
W.D. Langhans - Hercules Hattiesburg
F.J. Carlin - FJC Associates
M. Bonner - Bonner Analytical
T. Russell - MsDEQ
Dr. Earl Alley - MSU
B.J. Hough - Hercules, SHERA

HERCULES

FAX MESSAGE

Date 12/31/99 Page 1 of 1 page(s)

TO: CHRIS HAWKINS - MSDEQ FAX No. 601-961-5300

FAX No.

FROM: Timothy D. Hassett
Health & Environment
Telephone (302) 594-7656
Facsimile (302) 594-7255

RE: HATTIESBURG PLANT

MESSAGE:

CHRIS

PYP. HAPPY NEW YEAR. TIM

ORIGINAL WILL NOT BE SENT UNLESS OTHERWISE INDICATED:

. Follow by mail; . Follow by overnight express;

If transmission problems are noted, please call Isabelle Choplick at (302) 594-6580.

P:\docs\ghhwp\fam fax

HERCULES

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1313 North Market Street
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December 31, 1999

VIA FAX 601-961-5300
Mr. Chris Hawkins
EIT- Office of Environmental Quality
PO Box 10385
Mississippi Department of Environmental Quality
Jackson, Ms. 39289-0385

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Respectfully,

Timothy D. Hassett
Staff Environmental Engineer
Hercules Incorporated

Hawkins
CC: C. S. Jordan - Hercules Hattiesburg
W.D. Langhans - Hercules Hattiesburg
F.J. Carlin - FJC Associates
M. Bonner - Bonner Analytical
T. Russell - MsDEQ
Dr. Earl Alley - MSU
B.J. Hough - Hercules, SHERA

Eco•Systems, Inc.
Consultants, Engineers and Scientists

December 27, 1999

Mr. Chris Hawkins
Hazardous Waste Division, Superfund Branch, Uncontrolled Sites Section
Mississippi Department of Environmental Quality - Office of Pollution Control
P.O. Box 10385
Jackson, Mississippi 39289-0385

Re: Proposed Groundwater Monitoring Well Locations
Site Investigation Work Plan, February 16, 1999
Hercules, Inc.
Hattiesburg, Mississippi

Dear Mr. Hawkins:

Please find enclosed two copies of the Revised Task III Assessment Plan (Figure 3) for inclusion in the above-referenced Site Investigation Work Plan submitted on February 16, 1999. The revised figure reflects proposed changes in the locations of Monitoring Wells MW-8 and MW-9 based on the results of the groundwater elevation data collected during Task I. The groundwater flow patterns interpreted from the groundwater elevation data are illustrated on the attached Potentiometric Map (Figure 1).

Please provide your concurrence or comments regarding the proposed monitoring well locations so that Hercules will be ready to implement this work. If you have any questions, please do not hesitate to call me at 936-4440.

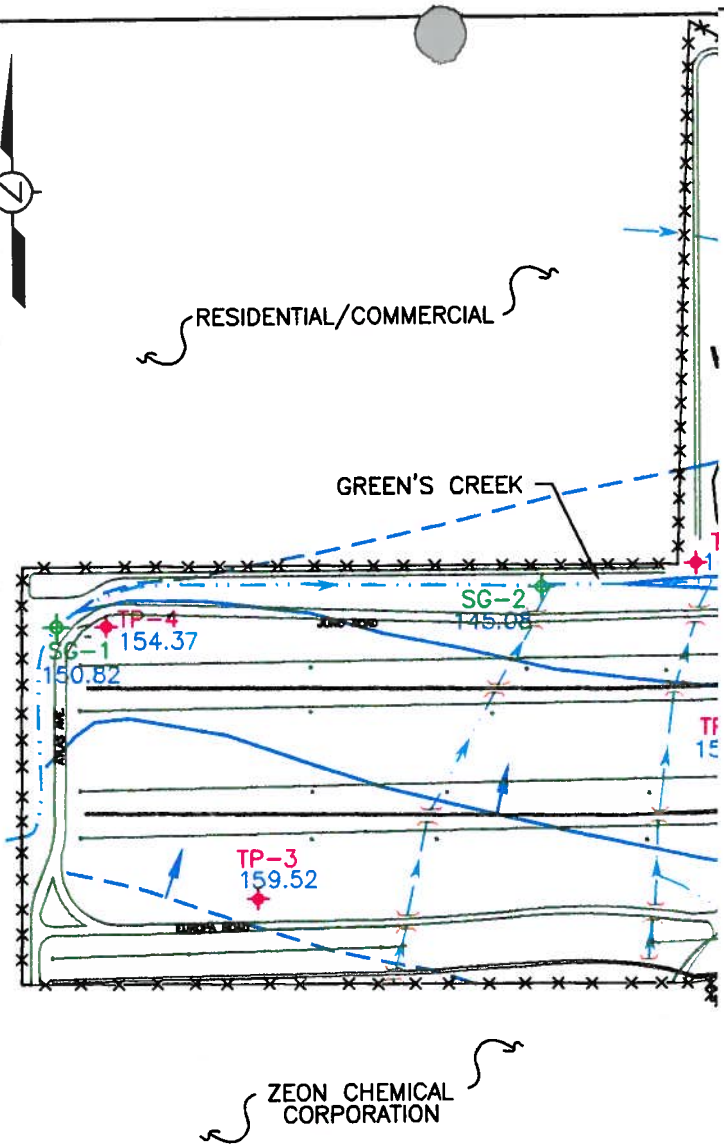
Very truly yours,
Eco·Systems, Inc.

Caleb H. Dana, Jr., P.E., CHMM
Principal Engineer

C: Mr. Tim Hassett, Hercules
Mr. Charlie Jordan, Hercules

Attachements

439 Katherine Drive, Suite 2A • Jackson, MS 39208 • Phone (601) 936-4440 • Fax (601) 936-4463



LEGEND

- TP-1 — PIEZOMETER LOCATION AND IDENTIFICATION
- SG-1 — STAFF GAUGE LOCATION AND IDENTIFICATIC
- MW-2 — EXISTING GROUNDWATER MONITORING WELL LOCATION AND IDENTIFICATION
- APPROXIMATE PROPERTY BOUNDARY
- FACILITY ACCESS ROADS
- INTERMITTENT DRAINAGE DITCH
- FACILITY RAILROAD
- 157.38 — POTENTIOMETRIC SURFACE ELEVATION (5–
- POTENTIOMETRIC SURFACE CONTOUR WITH

TO RIVER

NOTES

1. BASE MAP PROVIDED BY HERCULES, INCORPORAT

HERCULES
CHEMICAL SPECIALTIES

Eco·Systems, Inc.
Environmental Engineers and Scientists

SCALE: 1"=400'	DRAWN BY: A. LUQUET	DATE: 8-3-99
	CHKD. BY: CHR	DATE: 12-27-99
PROJECT NO. HER99072	CAD FILE HERPS01A.DWG	
UPPERMOST WATER-BEARING ZONE POTENTIOMETRIC SURFACE MAP MAY 11, 1999		FIGURE 1

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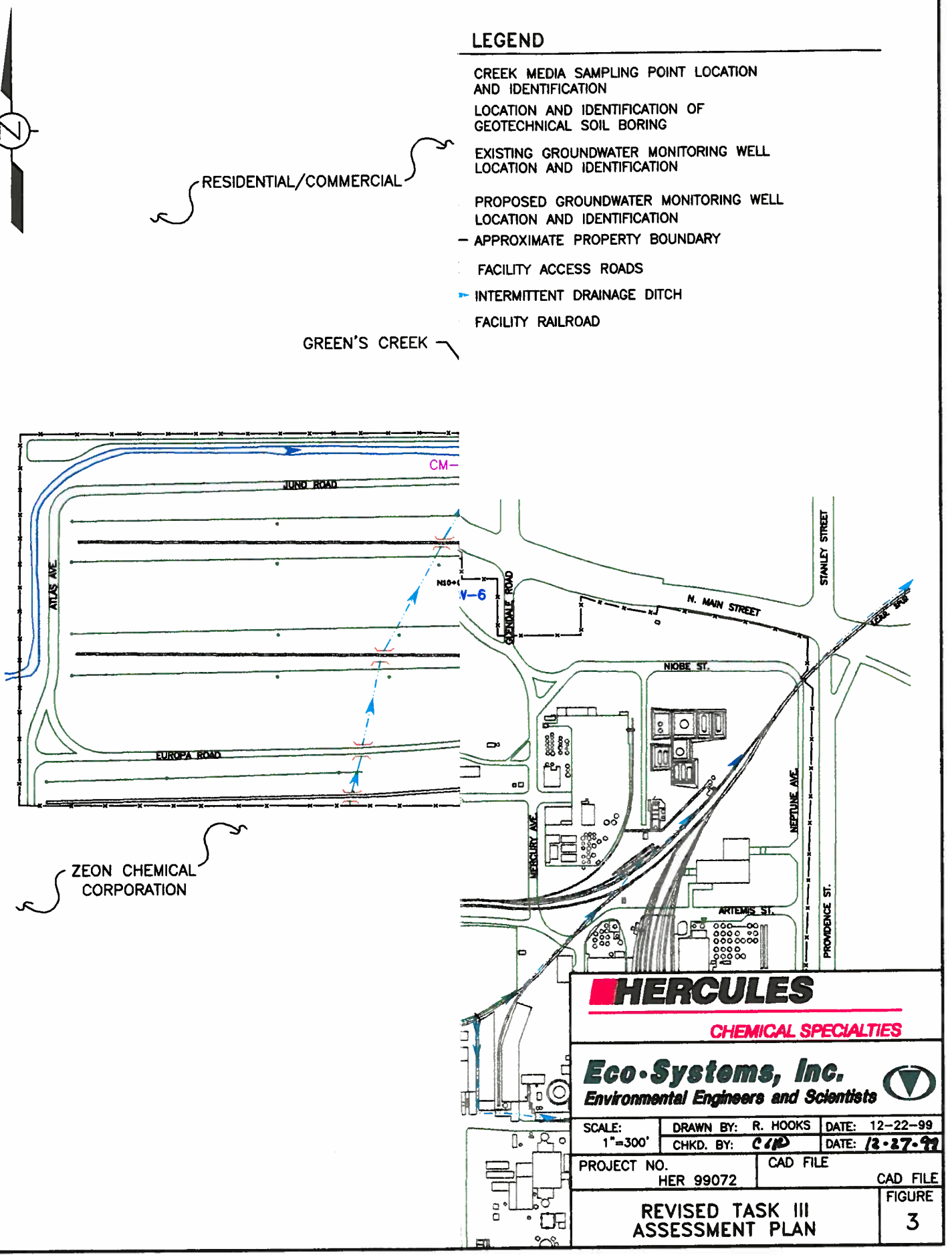

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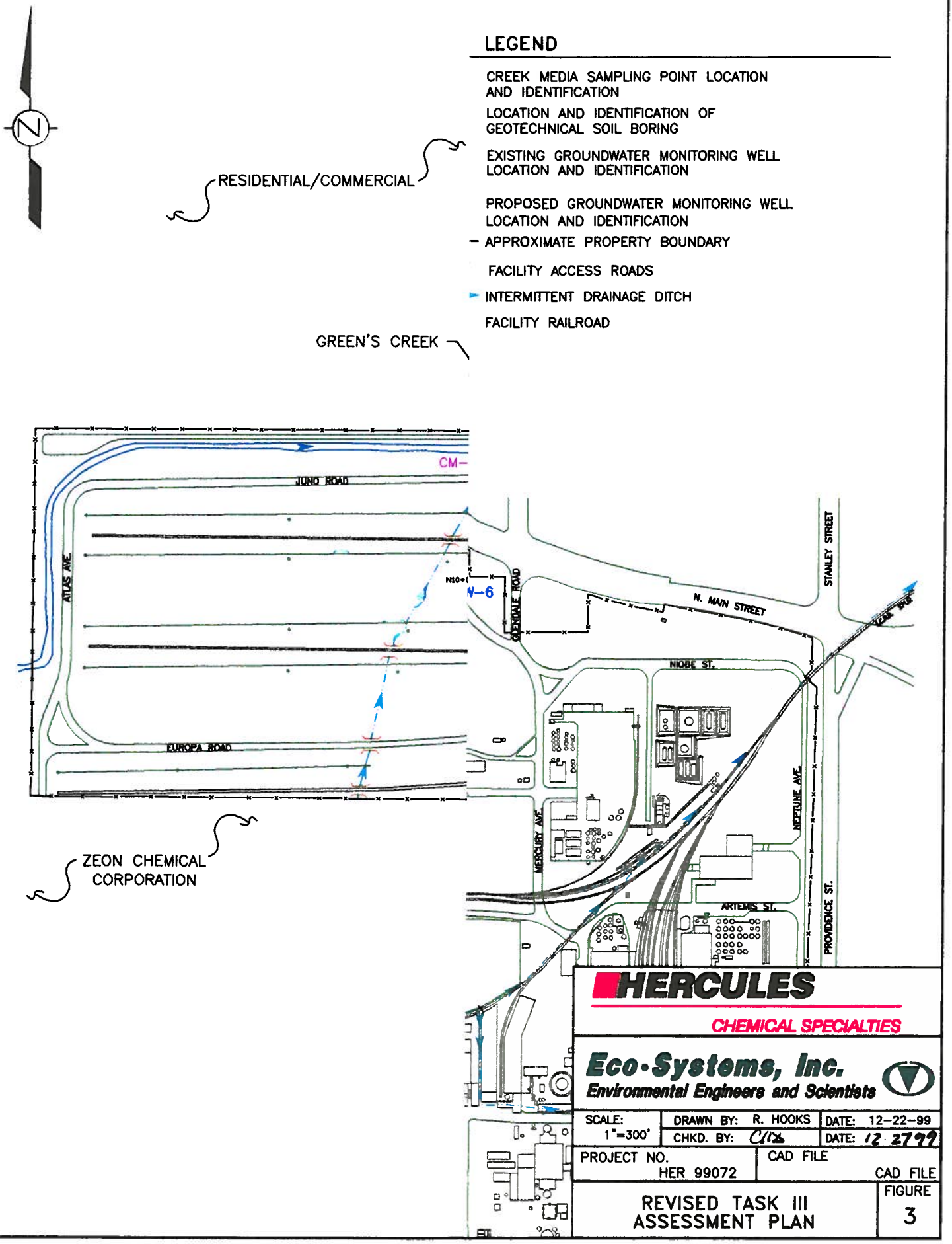

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Eco·Systems, Inc.
Consultants, Engineers and Scientists

December 22, 1999

Mr. Chris Hawkins
Mississippi Office of Pollution Control
P.O. Box 10385
Jackson, Mississippi 39289

RE: ***Site Investigation Work Plan and Associated Materials***
Hercules, Inc. Site - Hattiesburg, Mississippi

Dear Mr. Hawkins:

Eco·Systems, Inc. is pleased to provide to you the enclosed copy of the Site Investigation Work Plan (February 16, 1999) for characterization of the Hercules site in Hattiesburg, Mississippi. Also enclosed are the Addendum 1 – Task 4 for Site Investigation Work Plan (March 16, 1999) and a letter to the MDEQ dated March 5, 1999 in response to MDEQ comments regarding the work plan.

If you have any questions, please call Mr. Charles Jordan at (601) 545-3450 or me at (601) 936-4440.

Very truly yours,

Eco·Systems, Inc.

Caleb H. Dana, Jr., P.E., CHMM
Principle Engineer

cc: Mr. Timothy Hassett

Enclosure

439 Katherine Drive, Suite 2A • Jackson, MS 39208 • Phone (601) 936-4440 • Fax (601) 936-4463

March 16, 1999

Eco-Systems, Inc.
Consultants, Engineers and Scientists

Mr. Brian Young
Mississippi Office of Pollution Control
P.O. Box 10385
Jackson, Mississippi 39289

RE: Addendum 1- Task 4 for Site Investigation Work Plan
Hercules, Inc. Site - Hattiesburg, Mississippi

Dear Mr. Young:

Eco-Systems, Inc. is pleased to present one (1) copy of Addendum 1 - Task 4 for Site Investigation Work Plan. This addendum may be placed with the Site Investigation Work submitted to to the Mississippi Department of Environmental Quality on February 16, 1999. Please review and provide comment. Hercules is currently preparing to initiate field activities associated with Tasks I through Task III following the MDEQ approval of the Work Plan. Hercules will coordinate with the MDEQ regarding the details at least one (1) week in advance of mobilization.

If you have any questions, please call Mr. Charles Jordan at (601) 545-3450.

Very truly yours,
Eco-Systems, Inc.

John M. Ryan
Project Scientist

Caleb H. Dana, Jr., P.E., CHMM
Principal Engineer

cc: Mr. Tony Russell
Mr. Charles Jordan
Mr. Timothy Hassett

Enclosure

4294 Lakeland Drive, Suite 200 • Jackson, MS 39208 • Phone (601) 936-4440 • Fax (601) 936-4463

ESI

WORK PLAN ADDENDUM 1
SOURCE AREA CHARACTERIZATION (TASK IV)
HERCULES, INC.
HATTIESBURG, MISSISSIPPI

INTRODUCTION

Eco·Systems, Inc. (*Eco·Systems*) has been commissioned by Hercules, Incorporated (Hercules) to develop a remedial investigation strategy for conducting soils' characterization at the Hercules plant located in Hattiesburg, Mississippi (the Site). This work may be implemented to further investigate and screen for the potential of Dioxathion in source area(s) associated with the former production area at the Site. Dioxathion, the active ingredient of the product Delnav™ manufactured by Hercules, has been detected downgradient of potential waste disposal source areas. This addendum has been developed to supplement the investigative tasks presented in the Site Investigation Work Plan ((Work Plan), *Eco·Systems, Inc.*, February, 1999) as a conditional requirement following Work Plan approval by the Mississippi Department of Environmental Quality (MDEQ).

The necessity for implementing the characterization approach detailed in this addendum will be determined based on evaluation of the characterization data collected during Task I through Task III. Task I through Task III include:

- **Task I** - Collect split groundwater samples from existing monitoring points MW-4 and MW-5 to reconfirm the presence of Dioxathion in this area;
- **Task II** - Further define the Site's hydraulic flow regime, including flow direction and velocity, representative of the uppermost water-bearing zone and associated surface water (Green's Creek); and
- **Task III** - Further characterize the extent of Dioxathion impact to groundwater and refine the hydrogeologic model.

This Work Plan Addendum outlines the objectives and technical approach of the proposed additional characterization; describes the field methods and sampling procedures to be implemented; outlines the reporting that will be performed; and presents an anticipated schedule for completion of the investigative tasks. The Work Plan will be referenced throughout for any component that coincides with this addendum.

TECHNICAL APPROACH

The general objective of this investigation is to collect information regarding the potential source(s) of Dioxathion that may be releasing to environmental media that may have contained Dioxathion. Characterization data collected during Task I through Task III will be used to refine and focus the proposed additional characterization activities of Task IV. This additional information will be used in concert with previously collected data to

characterize the environmental conditions representative of the Site and develop potential management alternatives. Specifically, the proposed additional source area investigation objectives are as follows:

- Screen surficial soils, landfilled debris, sludge pit material and/or native soils for Dioxathion-impact and identification of potential source areas; and
- Determine the lateral and vertical extent of potential source areas to better guide selection of potential management alternatives.

The following sections describe the proposed sampling scope of work, numbers and locations of samples, collection methods and procedures, and laboratory analysis.

SOILS CHARACTERIZATION

As illustrated in Figure 1, the proposed soils characterization is outlined for each area of concern below as well as characterization activities common to each area. Sampling in each area of concern will be focused on near-surface soils and/or landfilled debris. Field screening techniques (organic vapor analyzer and visual observation) will be utilized to guide in evaluation of conditions in the field. Native soils underlying the waste matrix in each area of concern may be qualitatively screened in select borings. However, if saturated conditions are identified, the boring will be immediately terminated and sealed to the surface in order to avoid creating a conduit to the groundwater. This investigative strategy is presented as a preliminary approach and will be refined based on evaluation of the results obtained during initial phases of Site characterization. Boring placement in each area of concern will be focused to specific locations accordingly in the field. In addition, the number of borings may be adjusted based on conditions encountered in the field. Specifically, the following activities are proposed for each area:

Soil Characterization Common to All Areas

- Conduct continuous soil sampling for lithologic description and Dioxathion analysis on two (2) foot centers until native soils and/or the uppermost water-bearing zone is encountered;

Former Delnav Production Area

- Complete three (3) borings (SB-1 and SB-3) in the former production area and conduct continuous two-foot sampling for Dioxathion in soils overlying groundwater.

Former Industrial Landfill Area

- Complete three (3) borings (SB-4 through SB-6) within the former industrial landfill into native soils underlying the landfilled debris and/or uppermost water-bearing zone.

- Complete four (4) exploratory trenches (LB-1 through LB-4) on the anticipated outer edge of the landfill to establish the potential lateral boundary of waste disposal. Additional trenches may be necessary to adequately define the boundary.

Sludge Pit Disposal Area

- Complete four (4), equally-spaced borings (SB-7 through SB-10) within the disposal area into native soils underlying the sludge matrix.

METHODS AND PROCEDURES

Soil Sampling

As detailed in the Work Plan, samples for lithologic description will be collected with a hydraulic probing apparatus (Geoprobe™, or similar) from each interval in each boring. Such units are designed to expedite boring advancement and sample collection, as well as to minimize or eliminate the generation of soil cuttings. Soil cores collected from the placement of borings will be visually described for lithologic analysis and used to update existing geologic cross-sections across the areas of concern. Soil boring techniques, sample collection and description, will be repeated for each sampling location and logged on Soil Boring Logs provided in Appendix A - Field Data Collection Forms of the Work Plan. A detailed sampling and analytical protocol is currently being developed for analysis of Dioxathion in soil. This protocol will be submitted to the MDEQ for approval. The approved soil analytical protocol will be incorporated into this addendum as Attachment A.

Soil samples will be collected from each boring on a continuous basis (two-foot intervals) for field screening using visual observation and "headspace" analysis. If impacted material is identified in a particular boring based on field screening techniques, subsequent borings may be placed accordingly in an effort to define the lateral extents of the impacted material. *Borings will not be extended below the waste material, to avoid creating a potential conduit to underlying groundwater.* A representative portion of sample from each interval will be placed into a pint-sized, sealed Ziploc™ bag, desegregated to increase the surface area, and monitored for organic compounds after a set amount of time (e.g., five minutes). "Headspace" readings will be recorded by inserting a commercial, portable organic vapor detector into the bag and reading the maximum concentration of total organic compounds. A soil sample for Dioxathion analysis will be collected from each two (2) foot interval within the waste matrix in each boring. Additional samples for Dioxathion analysis may be collected, depending of Site conditions. The soil samples will be collected as follows.

A portion of the soil recovered from the selected sampling interval will be placed into a clean stainless-steel bowl and mixed thoroughly until a homogeneous, lump-free mixture is obtained. A representative portion of this mixture will be sealed in a clean, laboratory-supplied 8-ounce glass jar with a screw-on Teflon-lined lid for laboratory

analysis. This sample jar will then be labeled, sealed in a plastic bag, and placed on ice in a laboratory-supplied cooler. Soil probing and sample collection will be repeated for each boring location or sampling interval. Subsequent to collection, the soil samples will be shipped to the designated laboratory for analysis of Dioxathion. All boreholes will be grouted to land surface following sampling activities.

Analytical Methods

Geochemical samples will be analyzed by a qualified laboratory using EPA-approved methods. For Dioxathion in soil, EPA SW846 methods will be used. Specifically, extraction and analysis will be accomplished using Methods 3510 and 8141, respectively. As presented in Appendix B - Laboratory Analytical Methods of the Work Plan, a detailed analytical protocol for analysis of Dioxathion in water samples has been developed to assist project and regulatory personnel. A soil analytical protocol will be prepared for analysis of Dioxathion and submitted to the MDEQ for approval. Hercules will obtain the MDEQ's approval prior to performing soil sampling for Dioxathion analysis. The approved soil analytical protocol will be incorporated into Attachment A.

QA/QC Procedures

To attain QA/QC objectives in terms of accuracy, precision, completeness, comparability, and representativeness, QA/QC samples will be collected and sent to the analytical laboratory for analysis. QA/QC samples collected in the field will consist of field duplicates, and equipment rinsate blanks. Field duplicates will be collected at a frequency of one (1) per ten (10) samples per matrix. Split samples will also be collected for regulatory oversight at a frequency of one (1) per ten (10) samples per matrix. Field duplicate and split samples will be collected by initially filling a large glass container of sufficient volume to fill two (2) individual bottles. Following agitation to homogenize the volume, each sample bottle will be filled with alternating aliquots to assure representative replicates for each sample. Equipment rinsate blanks will be collected at a frequency of one (1) per twenty (20) samples per matrix. Equipment rinsate samples will be collected immediately following sampling equipment decontamination by running deionized water through decontaminated sampling equipment and collecting this water in sample containers.

Other Procedures

Procedures for sample containerization and packing, sample shipment, cross-contamination control, sample identification, decontamination, management of investigative-derived waste, field documentation, health and safety, chain-of-custody, and data review will be conducted in accordance with procedures defined in the Site Investigation Work Plan (*Eco·Systems, Inc.*, February, 1999) and EPA Region IV Environmental Investigations Standard Operating Procedures and Quality Assurance Manual (May, 1996).

REPORTING

The MDEQ will be notified at least two (2) weeks prior to conducting the proposed field activities. A report documenting the field activities of Task I through Task IV and the analytical results will be submitted to the MDEQ in accordance with the schedule proposed in the following section. The report will include the following: 1) the project objectives, field methods and procedures; 2) tabular and graphical presentation of the data; and, 3) conclusions and recommendations based on the investigative findings.

ANTICIPATED SCHEDULE

Field activities described herein and submittal of the final characterization report to the MDEQ are anticipated to be completed within approximately 70 days, respectively, of authorization to proceed following submittal of the preliminary report of Task I through Task III investigative findings. This schedule may be adjusted accordingly based on Task I through Task III results. Laboratory results are anticipated to be received three (3) weeks after completion of sampling activities. The estimated schedule for activities anticipated to complete this investigation is shown below.

ACTIVITY	DAYS FROM START
Complete Task IV Field Work (14 Days)	14
Receive Analytical Data (21 Days)	35
Preparation and Submittal of Draft Report to Hercules (21 Days)	56
Submit Final Report to MDEQ (14 Days)	70

However, Hercules may elect to perform the additional characterization described in Task IV in lieu of submittal of a preliminary report. A final report addressing Task 1 through Task IV will instead by submitted in accordance with the above schedule.

Eco-Systems, Inc.
Consultants, Engineers and Scientists

March 5, 1999

Mr. Brian Young
Hazardous Waste Division, Superfund Branch, Uncontrolled Sites Section
Mississippi Department of Environmental Quality - Office of Pollution Control
P.O. Box 10385
Jackson, Mississippi 39289-0385

Re: **Response to the Mississippi Department of Environmental Quality (MDEQ) letter dated February 23, 1999**
Site Investigation Work Plan
Hercules, Inc. (Hercules)
Hattiesburg, Mississippi

Dear Mr. Young:

This letter is provided on behalf of Hercules in response to your letter dated February 23, 1999, regarding comments following your review of the above-referenced Site Investigation Work Plan (Work Plan) prepared for Hercules facility located in Hattiesburg, Mississippi. It also reflects our telephone discussion of March 4, 1999 and agreement on steps to implement the Work Plan. Hercules requests that the current Work Plan previously submitted to the MDEQ be approved so that implementation of the work identified therein may begin. Hercules will also prepare an addendum to the Work Plan to address the MDEQ Comment 1 discussed below. Our response has been prepared in the same order and sequence as your comments.

MDEQ Comment 1.

"Section 1.1 states that the purpose of the site investigation plan is to determine if Dioxathion has migrated off-site and to locate the source of the groundwater contamination. However, the Work Plan only addresses characterizing the groundwater of the site, without searching for potential sources of the groundwater contamination. There are at least three obvious potential source areas: the sludge disposal pits, the former Delnav production area, and the former industrial landfill area. Therefore, the MDEQ requires that Hercules submit an addendum to the Site Investigation Work Plan for investigating the soils and sludges in these potential source areas within two weeks of the date of this letter."

Hercules Response:

Hercules will prepare an addendum for investigating the soils and sludges in the potential source areas of the sludge disposal pits, the former Delnav production area, and the former industrial landfill area. The addendum will be prepared and submitted to the MDEQ by March 16, 1999, as agreed on the telephone. The addendum will reflect a new Task IV for this investigation. Hercules would like to complete the groundwater investigations outlined in Tasks I through III of the Work Plan and review the results prior to implementing the field work associated with investigating potential source area soils or sludges. This sequence will also allow for timely implementation of the current Work Plan while the addendum is being prepared and approved. This approach will also be consistent with the project objectives stated in the Work Plan. Hercules does wish to reserve the right to revisit the need to perform such investigations depending on the results of the groundwater sampling and other information developed regarding the site conditions.

MDEQ Comment 2.

"All new monitoring well installations shall be screened in the lower section of the shallow aquifer."

Hercules Response:

Agreed, unless the water bearing zone is not found to be technically or physically amenable to this. Also, screens will not be planned to straddle the potentiometric surface.

MDEQ Comment 3.

"An additional piezometer is requested on the east side of the site between TP-2 and TP-9."

Hercules Response:

Agreed. Hercules requests the MDEQ provide assistance in obtaining Zeon Chemical Company's permission to use one or more of its monitoring wells for piezometric elevations during this investigation. Hercules would also like to evaluate the well construction details of the selected wells to assure monitoring the same water-bearing zones.

MDEQ Comment 4.

"The sample collection procedures outlined in the Work Plan for groundwater are different from the procedures developed as part of the protocol developed by Hercules, Inc., and the Mississippi State Chemical Laboratory. Which procedures does Hercules, Inc. intend to use?"

Hercules Response:

Hercules will utilize the low-flow/low-stress sampling approach versus convention teflon bailer for collecting the necessary water. To prepare split samples, Hercules will collect the sample in a single container, homogenize, and then prepare aliquots in individual sample containers for Hercules and for MSCL for laboratory analysis. The Work Plan will be revised to reflect this approach.

MDEQ Comment 5.

"In general, when using low flow purging and sampling techniques, the MDEQ considers a well ready to sample when the field indicator parameters have stabilized as follows: pH $\pm$ 0.1, temperature $\pm$ 0.5 F, conductivity $\pm$10%, turbidity < 10 NTU's (or $\pm$ 10% if turbidity is high), and dissolved oxygen $\pm$ 10%. The MDEQ requests that dissolved oxygen (DO) be added to the field indicator parameters."

Hercules Response:

Agreed.

MDEQ Comment 6.

"The MDEQ will NOT be providing water samples spiked with Dioxathion for inclusion in this study. If laboratory spiked samples are needed for QA/QC purposes, Hercules should obtain those samples from the laboratory that will be analyzing the samples."

Hercules Response:

Hercules will obtain laboratory-spiked samples for QA/QC purposes if it is determined as necessary.

Additional Comments

Hercules wishes to provide these additional comments for clarification purposes:

1. References to the "up to thirteen (13) piezometers" in the first paragraph of Section 3.2 on page 6 of the Work Plan and the reference to the "approximately 12 piezometers" in the same section below in the "outline of groundwater activities common to all areas" refer to the same piezometers.

2. Hercules wishes to clarify Section 4.8 regarding the "disposal of investigative-derived wastes (IDW) within 14 days of receipt of all characterization data". Hercules intends to profile the IDW as soon as possible for disposal in accordance with all rules and

regulations using Best Management Practices (BMPs). Upon completion of profiling, Hercules intends to schedule the disposal of the IDW in accordance with all rules and regulations with a goal of 14 days. The MDEQ will be advised of the disposal efforts and activities for their concurrence.

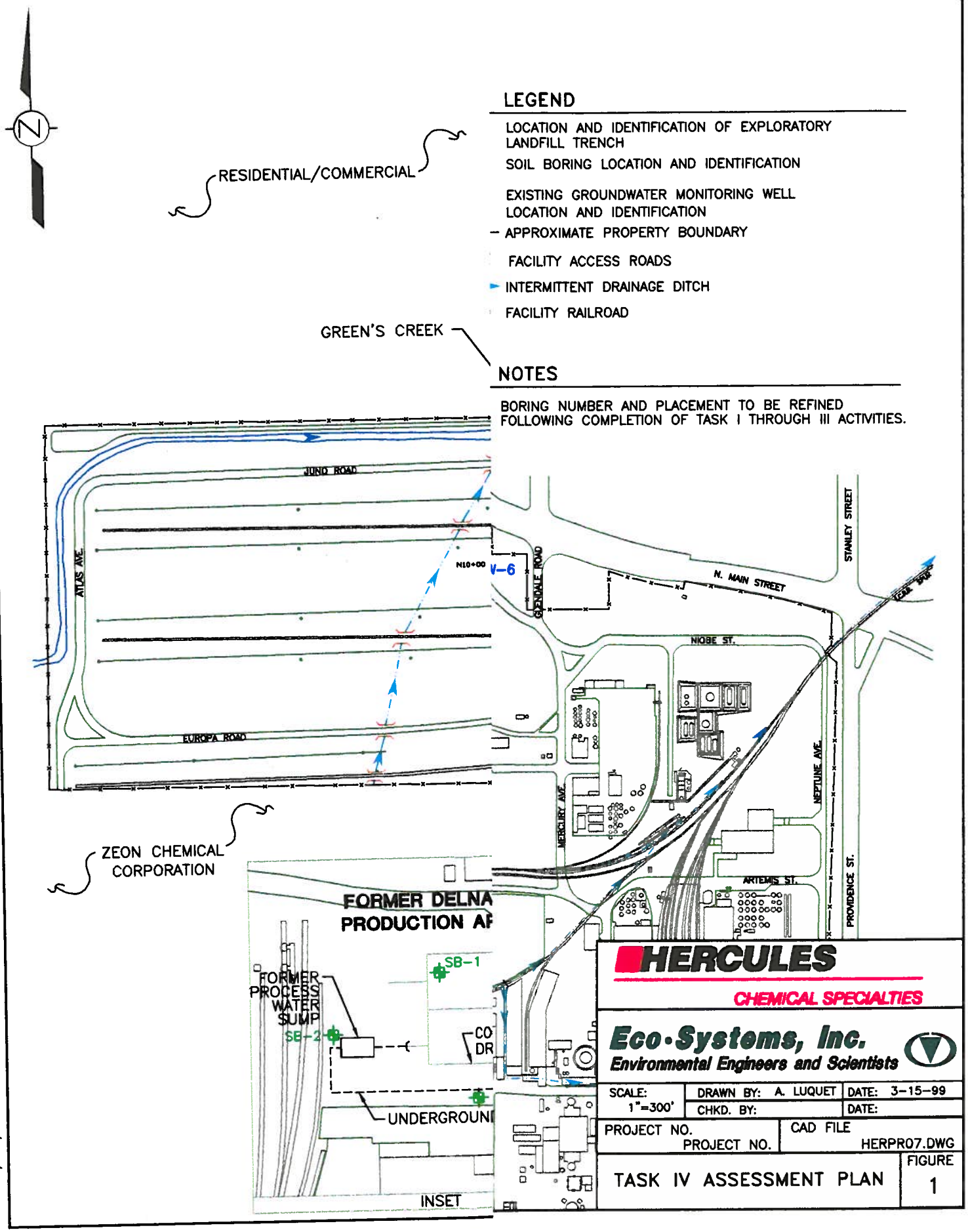
Closing

If you have any questions or need further information, please do not hesitate to call me at (601) 545-3450, ext. 360.

Very truly yours,
Eco·Systems Inc.

Caleb H. Dana, Jr., P.E., CHMM
Principal Engineer

c: Mr. Charles S. Jordan, Hercules Inc.
Mr. Timothy Hassett, Hercules Inc.



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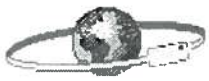


fcarlin@herc.com on 12/07/99 08:28:20 AM

To: earl@ra.msstate.edu
cc: thassett1@herc.com, cjordan@herc.com, wlanghans@herc.com, Chris Hawkins/HW/OPC/DEQ@DEQ, batco@c-gate.net

Subject: HPLC ANALYSIS OF DIOXATHION

Dear Dr. Alley,

Since our telephone conversation about the HPLC separation of cis- and trans-dioxathion, I have reviewed the Hercules report from 1972. That report contains much more detailed information than we have discussed, and I thought it would be good to send you a copy of the full report. In it you will find information about the UV absorption of the dioxathion and some model compounds. Based on the information in the report, the UV sensitivity of the cis- and trans-isomers are equal. There is also some other pertinent information about the analysis of the compounds.

I have spoken to our current HPLC expert, and he recommends a change in mobile phase to acetonitrile. This will give a UV window at lower wavelengths than in the report and might give a possibility of finding a better wavelength to permit better sensitivity for the cis- and trans-dioxathion.

I will send you a copy of the report today by FAX. Please feel free to contact me if you have any questions or comments about the information in the report.

Best wishes.

Frank Carlin

P.S. Mike, I will be sending you a copy by FAX, also.

Chris Hawkins
601-961-5300
From:
T D Hassett
Charlie Jordan
8-545-3226

dioxathion (Delnav) Page 1

dioxathion

CHEMICAL NAME:	2,3-p-Dioxanedithiol S,S-bis-(O,O-diethyl-phosphorodithioate) (56)
DEC INGRED. CODE:	
TRADE NAME(S):	Delnav, Deltic (56)
FORMULATION(S):	Delnav is available as 47% and 81% emulsifiable concentrates (plant application), and as 15% and 30% emulsifiable livestock formulations. Deltic is sold as a 30% EC only (56).
TYPE:	Organophosphate insecticide-miticide
BASIC PRODUCER(S):	BFC Chemicals, Inc. 4311 Lancaster Pike P.O. Box 2867 Wilmington, DE 19805
STATUS:	Restricted use

PRINCIPAL USES: Delnav for control of insects and mites on grapes, walnuts, ornamentals, apples, pears, and quince. For the control of ticks, lice, horn fly, and sheep ked on cattle, goats, sheep, and hogs as a spray or dip.

Deltic is a restricted use pesticide for exterior control of fleas, ticks, and clover mites in lawns, yards, industrial sites, recreational areas, dog runs, dog houses, and kennels (56).

I. EFFICACY

Important Pests Controlled: Mites, thrips, apple maggot, codling moths, grape leafhoppers, ticks, flies, lice, and many others (8a).

Some ovicidal activity has been shown. Residual lasts several weeks to several months, but has not shown direct systemic activity. Slow acting, since it takes three to seven days for complete control (8a).

II. PHYSICAL PROPERTIES

MOLECULAR FORMULA:	C12 H26 O6 P2 S4 (62)
MOLECULAR WEIGHT:	456.5 (62)
PHYSICAL STATE:	Brown liquid (technical product, 68-75% pure, 24% cis-, 48% trans-isomers, c.30% related compounds) (62).
SOLUBILITY:	Insoluble in water (technical product) (62)

III. HEALTH HAZARD INFORMATION

OSHA STANDARD: None established

NIOSH RECOMMENDED LIMIT: None established

ACGIH RECOMMENDED LIMIT: TWA (Time Weighted Average) = 0.2 mg/m3; skin notation (15c).

TOXICOLOGY

A. ACUTE TOXICITY

DERMAL: LD50 (rat) = 235 mg/kg (male); 63 mg/kg (female) (62).

ORAL: LD50 (rat) = 43 mg/kg (male); 23 mg/kg (female) (62).

EYES: Dioxathion produces mild transient conjunctivitis but no transient or permanent corneal damage when 0.1 ml is instilled into the eyes of rabbits (15b).

B. SUBACUTE AND CHRONIC TOXICITY:

Cholinesterase inhibition was observed in female rats receiving 10 mg/kg diet (62).

Subacute oral toxicity studies, using inhibition of brain, erythrocytes or plasma cholinesterase as the primary indicator of an effect, indicated a no effect level in rats of 3 ppm (approx. 0.22 mg/kg/day). Subacute oral toxicity studies in dogs produced less clear-cut data but indicated a no effect level between 0.075 and 0.25 mg/kg/day. Subacute administration to human volunteers of 0.075 mg/kg/day produced no effect on either plasma or erythrocyte cholinesterase. However, volunteers receiving 0.150 mg/kg/day showed a possibly significant slight depression of plasma cholinesterase activity, but no erythrocyte activity. Dioxathion does not produce myelin degeneration in chickens (15b).

Multigeneration reproductive effects studies in rats indicated a no effect level in rats of 10 ppm, when litter size, pup survival, weanling body weights, growth, mortality, clinical parameters, organ weights and reproductive capacity were used as parameters. The estimate for acceptable daily intake for man set by the World Health Organization is 0.0015 mg/kg/day (15b).

IV. ENVIRONMENTAL CONSIDERATIONS

Some hazard to birds, fish and beneficial insects. Relatively nonhazardous to honey bees. Biological magnification unlikely. Nonphytotoxic (1).

Toxic to fish and wildlife (8a).

Approximate Residual Period: 2 weeks on plant surfaces; up to 6 months on unexposed surfaces (1).

V. EMERGENCY AND FIRST AID PROCEDURES

The chemical information provided below has been condensed from original source documents, primarily from "Recognition and Management of Pesticide Poisonings", 3rd ed. by Donald P. Morgan, which have been footnoted. This information has been provided in this form for your convenience and general guidance only. In specific cases, further consultation and reference may be required and is recommended. This information is not intended as a substitute for a more exhaustive review of the literature nor for the judgement of a physician or other trained professional.

If poisoning is suspected, do not wait for symptoms to develop. Contact a physician, the nearest hospital, or the nearest Poison Control Center.

FREQUENT SYMPTOMS AND SIGNS OF POISONING BY ORGANOPHOSPHATE PESTICIDES

Symptoms of acute poisoning develop during exposure or within 12

hours (usually within four hours) of contact. HEADACHE, DIZZINESS, WEAKNESS, INCOORDINATION, MUSCLE TWITCHING, TREMOR, NAUSEA, ABDOMINAL CRAMPS, DIARRHEA, and SWEATING are common early symptoms. Blurred or dark vision, confusion, tightness in the chest, wheezing, productive cough, and PULMONARY EDEMA may occur. Incontinence, unconsciousness and convulsions indicate very severe poisoning. SLOW HEARTBEAT, salivation, and tearing are common. TOXIC PHYCHOSIS, with manic or bizarre behavior, has led to misdiagnosis of acute alcoholism. Slowing of the heartbeat may rarely progress to complete sinus arrest. RESPIRATORY DEPRESSION may be fatal. Continuing daily absorption of organophosphate at intermediate dosage may cause an INFLUENZA-LIKE ILLNESS characterized by weakness, anorexia, and malaise (25).

SKIN CONTACT: Bathe and shampoo victim with soap and water if there is any chance that skin and hair are contaminated (25).

INGESTION: If victim is alert and respiration is not depressed, give Syrup of Ipecac, followed by 1-2 glasses of water to induce vomiting; adults (including children over 12), 30 ml; children (under 12 years), 15 ml (25).

NOTES TO PHYSICIAN:

Administer ATROPINE SULFATE intravenously, or intramuscularly, if IV injection is not possible.
In MODERATELY SEVERE poisoning: Adult dosage: 0.4-2.0 mg repeated every 15 minutes until atropinization is achieved: tachycardia (pulse of 140 per minute), flushing, dry mouth, dilated pupils. Maintain atropinization by repeated doses for 2-12 hours or longer depending on severity of poisoning.
Dosage for children under 12 years: 0.05 mg/kg body weight, repeated every 15 minutes until atropinization is achieved. Maintain atropinization with repeated dosage of 0.02-0.05 mg/kg.
SEVERELY POISONED individuals may exhibit remarkable tolerance to atropine; two or more times the dosages suggested above may be needed.
Administer PRALIDOXIME (Protopam (TM)-Ayerst, 2-PAM) in cases of severe poisoning in which respiratory depression, muscle weakness and twitchings are severe.
Adult dosage: 1.0 gm intravenously at no more than 0.5 gm per minute.
Child's dose (under 12 years): 20-50 mg/kg (depending on severity of poisoning) intravenously, injecting no more than half the total dose per minute.
Dosage of pralidoxime may be repeated in 1-2 hours, then at 10-12 hour intervals if needed. In very severe poisonings, dosage rates may be doubled (25).

VI. FIRE AND EXPLOSION INFORMATION

To be developed.

VII. COMPATIBILITY

Compatible with insecticides and fungicides except alkaline materials (8a).

VIII. PROTECTIVE MEASURES

STORAGE AND HANDLING: Not for use or storage in or around the home environment. Do not contaminate water, food or feed by storage or disposal (56).

PROTECTIVE CLOTHING: Wear clean, protective clothing, heavy rubber gloves, and goggles. Remove contaminated clothing and wash skin thoroughly with soap and water. Do not eat or smoke during exposure. Wash hands and face before eating or smoking. After use, bathe

thoroughly and change to clean clothing. Wash all contaminated clothing with soap and hot water before reuse. During application keep unprotected persons away from areas being treated or where there may be drift (56).

IX. PROCEDURES FOR SPILLS AND LEAKS

IN CASE OF EMERGENCY, CALL, DAY OR NIGHT
(800) 424-9300
PESTICIDE TEAM SAFETY NETWORK/CHEMTREC

X. LITERATURE CITED

1. Harding, W.C. 1979. Pesticide profiles, part one: insecticides and miticides. Univ. Maryland, Coop. Ext. Serv. Bull. 267. 30 pp.

8a. Thomson, W. T. 1976. Agricultural chemicals - book 1: insecticides, acaricides, and ovicides. Revised ed. Thomson Publ., Indianapolis, IN. 232 pp.

15b. American Conference of Governmental Industrial Hygienists. 1971. Documentation of the threshold limit values for substances in workroom air with supplements for those substances added or changed since 1971, 3rd ed., 4th printing (1977). Cincinnati, OH. 484 pp.

15c. American Conference of Governmental Industrial Hygienists. 1984. TLVs: threshold limit values for chemical substances and physical agents in the work environment and biological exposure indices with intended changes for 1984-85. Cincinnati, OH. 116 pp.

25. Morgan, D.P. 1982. Recognition and management of pesticide poisonings, 3rd ed. U.S. Environmental Protection Agency, Washington, DC. 120 pp.

56. Farm Chemicals Handbook, 70th ed. 1984. R. T. Meister, G. L. Berg, C. Sine, S. Meister, and J. Poplyk, eds. Meister Publishing Co., Willoughby, OH.

62. The Pesticide Manual: A World Compendium, 7th ed. 1983. C.R. Worthing, ed. The British Crop Protection Council, Croydon, England. 695 pp.

4/17/85

To Top

For more information relative to pesticides and their use, please contact the PMEP staff at:

5123 Comstock Hall
Cornell University
Ithaca, New York 14853-0901
(607)-255-1866

Last Modified: 03/17/1998
Questions regarding the development of this web site should be directed to the PMEP Webmaster.

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
James I. Palmer, Jr., Executive Director

MEMORANDUM

TO: **Hercules Inc. File**

FROM: **Chris Hawkins** CH

DATE: **December 2, 1999**

SUBJECT: **Meeting**
Phone Conversation

On December 1, 1999, Tony Russell and I had a meeting with Hercules to discuss some issues about the site. This meeting was called for by Tim Hassett with Hercules. Attached is the agenda and meeting attendees list. Tim stated that their plans were to get some standards for Dioxathion and determine if it is going off site. They want to make sure there is not a continuing source on site and possible look at an Agreed Order in the future. Most of the meeting consisted of Dr. Alley and Mike Bonner discussing lab results and different methods of examining Dioxathion (cis and trans) and the daughter compound associated with this chemical. They said that within 2-3 weeks they could probably develop a gross standard for Dioxathion and the daughter compound. Hopefully by first of February they will have a MDL. They will contact us on January 11, 2000 at 9:00 A.M. for a conference call to update us on their progress.

On December 2, 1999, Tony Russell and I had a conversation over the phone with Tim Hassett and Charles Jordon. They asked if they could forget about the daughter compound at this time and work on getting a standard and a MDL for Dioxathion. After a conversation with Dr. Alley, Tony agreed that they could focus on Dioxathion at this time.

OFFICE OF POLLUTION CONTROL
P.O. Box 10385 Jackson, MS 39289.0385 Phone 601.961.5171 Fax 601.354.6612

Mississippi Department of Environmental Quality
Meeting Attendees List

Date December 1, 1999

Company or Site Hercules Inc.

Location of Site Southport-Conference Rm #2

Participant	Company	Email Address	Phone Number
Chris Hawkins	MDEQ	Chris_Hawkins@deq.state.ms.us	(601) 961-5775
Tony Russell	MDEQ	Tony_Russell@deq.state.ms.us	(601) 961-5318
Earl Oakley	MSCL	earl@va.msstate.edu	662 325 3324
Mike Bonner	Bonner Analytical	batco@c-gate.NET	601-264-2854
Frank Carlin	EIC Analytical Consulting, Inc	frank7@gateway.net	(30) 738-3219
Timothy Hassett	Hercules	thassett1@herc.com	(302) 594-7654
CHARLES JORDAN	HERCULES	CJORDAN@HERC.COM	601 584 3360
WALT LANGHANS	HERCULES	WLANGHANS@HERC.COM	601-628-3220

Agenda for Hercules Meeting
December 1, 1999

The following are the highlights of what we would like to cover in this meeting.

- Restatement of the Project Mission
- Review of Work performed to date
- Problems encountered in the analysis of dioxathion
- Discussion of possible solutions to resolve the analytical
- Action Items

thassett1@herc.com on 11/19/99 01:38:07 PM

To: Chris Hawkins/HW/OPC/DEQ@DEQ
cc: cjordan@herc.com, wlanghans@herc.com, fcarlin@herc.com, jmcguire@herc.com, batco@cgate.net, bhough1@herc.com

Subject: Hercules - Hattiesburg Plant

Chris,

Per our conversation today, please pencil iin December 1, @ 10:00 A.M. for a meeting to discuss the status and directions of the focused site investigation at the Hattiesburg Plant. As we discussed, Hercules and the states consultant, Mississippi State have had problems developing a reliable method to identify and quantify dioxathion residues at our plant and I urge you to bring Dr. Alley from MSU to this meeting to help resolve these issues.

Attending this meeting from or on behalf of Hercules will be as follows:

- Walt Langhans - Plant Manger
- Charlie Jordan - Environmental Coordinator
- Frank Carlin - GC Chemist
- Possibly Jeff McGuire - Mass Spec Chemist
- Mike Bonner - Contract Lab
- Possibly Caleb Dana - Environmental Consultant
- Myself - Corporate Environmental Engineer

The following are the highlights of what we would like to cover in this meeting.

- Restatement of the Project Mission
- Review of Work performed to date
- Problems encountered in the analysis of dioxathion
- Discussion of possible solutions to resolve the analytical issue
- Action Items

BONNER ANALYTICAL TESTING COMPANY
Phone (601)264-2854
2703 Oak Grove Rd
Hattiesburg, MS 39402
Fax (601)268-7084
"Testing Your World for a Safer Tomorrow"

August 26, 1999

MS Dept. of Environmental Quality
101 West Capitol Street
Jackson, MS 39201
Attn: Tony Russell

Re: Hercules Inc. Hattiesburg Investigaton

Dear Tony:

I had a telephone conversation with Dr. Lane on Tuesday August 24, 1999 about the Dioxathion Analysis/MDL Study. He has ordered a new standard and we have requested that he send Bonner Analytical some of the new standard to evaluate. I believe the new standard was to arrive in Starkville on Wednesday 08-25-99. Hopefully we will get it here by Friday.

Hopefully, after State and Bonner evaluate the new standard, both labs can come to an agreement on which peak is dioxathion. At that time we can go forward with the next phase of the investigation.

Regards,

Michael S. Bonner, Ph.D.

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
James I. Palmer, Jr., Executive Director

FILE COPY

June 2, 1999

Mr. Timothy D. Hasset
Hercules Incorporated
Hercules Plaza
1313 North Market Street
Wilmington, DE 19894-0001

Re: Hercules, Inc.
Soil Sampling Protocol as transmitted May 11, 1999
Letter dated May 21, 1999
Hattiesburg, MS

Dear Mr. Hasset:

The Mississippi Department of Environmental Quality (MDEQ) has completed its review of the above referenced documents and has approved the soil sampling protocol. A Site Characterization Report describing the activity associated with the site investigation must be submitted to MDEQ by November 1, 1999, unless otherwise approved by MDEQ. The Site Characterization Report should be presented to MDEQ in the enclosed format. If insufficient data exists after this activity to adequately delineate the nature and extent (vertically and horizontally) of contamination, a Site Characterization Work Plan must be submitted for approval. A Site Characterization Work Plan format has also been enclosed for your benefit. The formats have been developed to assist parties in ensuring that all applicable items have been addressed and to assist MDEQ in expediting review of projects.

If you have any questions or comments, you may contact Chris Hawkins at (601) 961-5775.

Sincerely,

Jere "Trey" Hess, P.E.
MDEQ - Superfund Branch

cc: Charles S. Jordan - Hercules Inc.

Enclosure

K:\Shared\Brownfields\CHawkins\Hercules\June021999.doc

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
SITE CHARACTERIZATION REPORT FORMAT

General: This guidance presents the recommended content and format for the Site Characterization Report. **Please note that this guidance is comprehensive and does not segregate report content or format based on the varied media impacted**. Also note that many of the content items are common for all impacted media. The primary difference is whether the contaminated media are soil, sediment, surface water or groundwater only or a combination thereof. This format is designed to advise a person, prior to submitting an application, of the information necessary to achieve the adequate and cost-effective characterization of a Site. The guidance should be used and adapted as appropriate for the specific property being addressed. Strict adherence to this format and inclusion of the suggested contents will lessen the overall review time needed by the Mississippi Department of Environmental Quality (MDEQ) staff.

TITLE PAGE

A Title Page must be provided that includes, at a minimum, the following:

1) [PROPERTY] Site Characterization Report
2) Date: [DATE]
3) Presented on behalf of: [PARTY]
4) Prepared by: [CONSULTING FIRM]
5) Signature and Seal of the Professional Engineer (PE) and/or Registered Professional Geologist (PG), as necessary.
6) Signature and Seal (if applicable) of other Professionals
7) Signature of Project Manager

Note: Entries listed above in brackets and capitalized are specific to the Property that is the subject of the Site Characterization Report.

TABLE OF CONTENTS

A Table of Contents listing all required sections and their appropriate page number must be included.

SECTIONS

1.0 Executive Summary

Provide a preliminary summarization of the results of all previous investigation activities. This summary should include specific date(s) of all known separate investigative phases.

2.0 Introduction

Provide a description of the specific objectives for investigation activities including additional objectives established during the implementation of the Work Plan. Document how the objectives were achieved or not achieved.

2.1 Property Background

If this information was provided in the Work Plan, reference it accordingly.

2.1.1 Property Location and Demographics

List the property location, including latitude and longitude, street address, city, county, and describe general demographic information in the vicinity of the Site. Discuss population density, zoning and predominant land usage in the vicinity of the property.

2.1.2 Property History

Provide a brief history of the property including operations, a list of all chemicals stored, used, produced, discovered or otherwise managed on-site and copies of their Material Safety Data Sheets (MSDS), ownership, facility compliance history, off-site disposal practices, and past property activities. Include a discussion of any known off-site actual or potential sources of contamination.

2.1.3 Mining/Exploration Activities

Describe the history of mining, oil and gas exploration, and other intrusive activities on or in the vicinity of the Site. Also discuss the potential for mining/exploration activities from mineral interest owners.

2.1.4 Previous Investigation

Summarize results and conclusions from previous investigations conducted for the property. List the titles of all investigation reports that have been prepared. Copies of all investigation reports must be made available to MDEQ.

3.0 Investigative Activities

Describe in detail **how** all investigative activities were conducted as part of the site characterization relative to the tasks outlined in the Site Characterization Work Plan for the property. NOTE: If a Site Characterization Work Plan has been conditionally approved by MDEQ, the applicable sections of the Work Plan and the MDEQ conditions may be referenced. Areas that must be specifically addressed are listed below:

3.1 Source Area(s) Characterization

Describe how the vertical and horizontal extent and degree of contamination for all sources (soil, groundwater, surface water, sediments, air, etc.) that have impacted the site and the physical characteristics of the source area have been investigated.

3.2 Impacted Surface Water and Sediments

Describe how the vertical and horizontal extent of contamination of surface water and sediments and how the physical characteristics of surface water and sediment have been investigated.

3.3 Property Geology

Describe how the characteristics of the site specific geology of the property were determined(i.e., thickness of each layer, whether the layers are inter-connected, name of the geological formation, aquitard/aquiclude properties, etc.)

3.4 Property Soil and Vadose Zone Characteristics

Describe how the site specific soil and vadose zone characteristics (i.e., soil moisture content, soil organic carbon, cation exchange capacity, soil texture, dry soil bulk density, pH, etc.), and the nature and extent of contamination in soil have been investigated (i.e, sample collection technique, EnCore®, field preservation, hand augering, Photo Ionizing Detector (PID) field screening, etc.) NOTE: If samples have been analyzed for volatile organic compounds, a description of the sample collection techniques must be included and the techniques must be consistent with the "Guidance for Collecting Low-level Volatile Organic Compounds in Soil."

3.5 Property Ground Water/Aquifer Characteristics

Describe how the site specific groundwater/aquifer characteristics (i.e., hydraulic conductivity, flow rate, interconnectedness of aquifers, hydraulic gradient, infiltration/recharge, aquifer thickness) and the nature and extent of contamination in groundwater have been investigated (i.e., GeoProbe®, permanent wells, purging technique, stabilization technique, preservation, EPA Method(s) selection, etc.). NOTE: Purging techniques must be described and must be consistent with the EISOPQAM, unless otherwise approved by MDEQ-Superfund Branch. If Non-aqueous phase liquids (NAPLs) were encountered, a description of the methods utilized to measure thickness and nature and extent must also be presented.

3.6 Human/Target Population Surveys

Describe how the human/target population surveys were conducted (i.e., residential survey, population density, zoning, empowerment zones, enterprise community zones, etc.)

3.7 Area Water Well Surveys

Describe how the public, industrial, and private water well survey was conducted (i.e., records review, house-to-house survey, etc.). Note that record reviews normally do not identify all of the wells near a site. Also note that all wells discovered should be field verified. Public Water Supply (PWS) and WATSTOR wells provided by MDEQ and the USGS should be used for the initial identification of water wells in the area.

3.8 Ecological Target Surveys

Describe the steps taken to complete the Ecological Checklist.

4.0 Property Physical Characteristics

Provide a detailed description of the physical characteristics of the investigative activities. Results should be provided for investigative areas, as applicable, identified relative to Section 3.0 of this document.

4.1 Source Area(s) Physical Characteristics

Describe the physical characteristics for all sources (soil, groundwater, surface water, sediments, air, etc.) that have been investigated.

4.2 Impacted Surface Water and Sediments

Describe the physical characteristics of surface water and sediments that have been investigated.

4.3 Regional Geology

Describe the regional geology of the area. Discuss whether the characteristics of the site and the vicinity are conducive to mining/exploration (i.e., area is rich in kaolin clay that is mined in the vicinity of the site).

4.4 Property Geology

Describe the site specific geology of the property that has been investigated (i.e., thicknesses of each layer, whether the layers are interconnected, geological formations, aquitard/aquiclude properties, etc.).

4.5 **Property Soil and Vadose Zone Characteristics**

Describe the site specific soil and vadose zone characteristics that have been investigated (i.e., soil moisture content, soil organic carbon, soil texture, dry soil bulk density, pH, etc.).

4.6 **Property Ground Water/Aquifer Characteristics**

Describe the site specific groundwater/aquifer characteristics that have been investigated (i.e., hydraulic conductivity, flow rate, interconnectedness of aquifers, hydraulic gradient, infiltration/recharge, aquifer thickness).

4.7 **Human/Target Population Surveys**

Describe the results from the human/target population surveys that have been investigated (i.e., residential survey, population density, zoning, empowerment zones, enterprise community zones, etc.).

4.8 **Area Water Well Surveys**

List the results from the public, industrial, and private water well survey that was conducted (i.e., records review, house-to-house survey, etc.). Each well discovered shall be field verified.

4.9 **Ecological Target Surveys**

Provide a copy of the Ecological Checklist and copies of correspondence with appropriate federal and state authorities, if necessary.

5.0 Nature and Extent of Contamination

Present the **results** of the characterization for the media investigated. Describe in detail the horizontal and vertical extent of contamination identified for the media investigated. Provide reference to specific analytical results obtained, tables and figures. Media potentially addressed include:

5.1 **Sources and Source Areas (On-site and Off-site)**

5.2 **Soils and Vadose Zone**

5.3 **Air**

5.4 **Groundwater**

5.5 **Surface Water and Sediments**

5.6 **Non-aqueous Phase Liquids (Include both DNAPL and LNAPL)**

5.7 **Biological samples**

6.0 Contaminant Fate and Transport

6.1 **Potential Migration Routes**

Describe the potential routes of contaminant migration (i.e., air, soil, ground water, surface water, piping/conduits, etc.). Describe the basis for the steps taken to complete the BASELINE Site Conceptual Exposure Models (SCEM).

6.2 **Contaminant Characteristics**

Describe the physical and chemical properties of contaminants and provide specifics concerning behavior of these contaminants at the site.

6.3 **Contaminant Migration**

6.3.1 Discuss factors affecting contaminant migration for all media (e.g., sorption onto soils, solubility in water, movement of ground water, etc.). Evaluate whether contaminant migration has stabilized and provide analysis supporting stabilization (i.e., predominance of electron acceptors, aerobic environment, time trends, Mass Balance Approach, etc.). If contamination has not stabilized, determine the predictive extent of contamination and reference a figure depicting the predictive extent in Section 11.

6.3.2 If modeling has been used, discuss all modeling methods and results in detail.

7.0 Identification of Potential Receptors

7.1 **Receptors**

Identify any receptors which have been impacted or could potentially be impacted by the contamination. Receptors may include water supply wells, fish or animal populations, human populations, surface water bodies, sensitive ecosystems such as habitat for endangered species, etc.

7.2 **Potential Risk**

Describe the potential threat to impacted or potentially impacted receptors. Include discussion concerning toxicity of the contaminant(s) as related to the threat or risk posed, how the receptor has been or may be exposed to the contaminant, and other details to fully identify the risk posed by the contamination.

8.0 Quality Assurance Results

If this information was provided in the Work Plan, reference it accordingly.

8.1 Key Personnel

Key personnel or organizations that were necessary for implementing each activity during the investigation, along with their responsibilities, must be defined. Documentation of any required licenses or certifications (i.e., Professional Engineer, Registered Geologist, Licensed Water Well Driller, OSHA Hazardous Materials Technician, etc.) must presented to MDEQ prior to implementing field activity. All field personnel must meet the OSHA requirements of 49CFR 1910.120 for HAZWOPER training and updates, medical monitoring, and other requirements, as necessary.

8.2 Quality Assurance Objectives for Data

The degree of accuracy of sample analysis and how this degree of accuracy has been achieved must be identified. Also include within this section the numbers of, frequency and types of QA/QC samples such as trip blanks, field blanks, equipment blanks, and replicates which have been collected.

8.3 Sample Control and Field Records

Present standard procedures for sample identification, sample control, chain of custody, and field records.

8.3.1 **Sample Identification** - (See Section 3.2.1 of EISOPQAM)

8.3.2 Chain of Custody Procedures

Procedures used to maintain and document the possession of samples from the time of collection until the samples or the data derived from the samples must be presented.

8.3.3 **Field Records - (See Section 3.5 of EISOPQAM)**

8.4 Analytical Procedures

What specific laboratory methods have been used for analysis of samples.

8.5 Laboratory QA/QC

A description of the internal QA/QC program of the laboratory conducting the analyses.

8.6 **Data Validation and Reporting**

Describe how laboratory results have been validated to determine whether QA/QC protocol have been met. A summary of the data validation process including discussion describing results from analysis of replicates, laboratory or method blanks, matrix spikes and matrix spike duplicates, trip blanks, field blanks, equipment (rinsate) blanks, and other QA/QC samples must be presented.

8.0 Summary and Conclusions

8.1 **Provide a summary of the results addressing primarily:**

8.1.1 Nature and Extent of Contamination
8.1.2 Contaminant Fate and Transport
8.1.3 Identified Receptors/Risk

8.2 **Conclusions derived from the site characterization, including:**

8.2.1 Conclusions/Recommendations
8.2.2 Data Limitations

9.0 Remedial Action Evaluation

9.1 Based on conclusions from Section 8.2 prepare a detailed evaluation of remedial options in terms of their relative performance and life-cycle cost to identify the optimal risk management program for the Site. The relative performance of the remedial options should be evaluated on the basis of the following criteria:

- **Long-Term Effectiveness**: Magnitude of risk reduction achieved; reliability of controls.
- **Reduction of Mobility, Toxicity, or Volume**: Degree to which CoCs in source zone media are irreversibly destroyed, converted to a non-toxic state, or immobilized.
- **Near-Term Effectiveness**: Control of workers and community exposure/safety and environmental impacts duirng period of remedy installation or implementation; time period required to achieve corrective action objectives.
- **Implementability**: Ability to construct, operate, and monitor the performance of the remedial option; associated permitting requirements; availability of required equipment and services.
- **Cost Efficiency**: Life-cycle capital and operating costs relative to degree of risk reduction achieved.

The evaluation should include remedial options that would meet Tier 1 Unrestricted and Restricted TRGs, and the Tier 2 Remediation Goals (RGs), when appropriate. Utilize the BASELINE SCEM to define the proposed remedial action in terms of the targeted exposure points and the remedial options to be applied. Remedial options may include, where appropriate, deed restrictions and engineering controls.

9.2 Describe the remedial option that has been selected and the rationale for its selection. Complete the FINAL SCEM and describe the remedial actions that will be taken to minimize and/or eliminate risk to the public health and the environment.

9.3 If active remediation or compliance monitoring (i.e., long-term groundwater monitoring to ensure that plume has stabilized and is contained within site boundaries) is necessary, identify the anticipated date that MDEQ will receive a Corrective Action Plan (CAP) to address active remediation and/or a Compliance Monitoring Plan (CMP) to address compliance monitoring will be received by MDEQ.

10.0 Tables

Certain data collected during the investigation must be presented in tables in the Report. Specific data must be tabulated. Each table must be presented in the format described in the MDEQ's Guidance on Presenting Data in the Site Characterization Work Plan, Site Characterization Report, or Corrective Action Plan. Required tables include, but are not limited to the following list.

10.1 Soil Quality Field Screening

Provide field screening results for soils derived from conducting a soil gas survey, surface soil sampling, soil borings, and/or monitoring well borings. More than one table may be required to include the following types of information:

1) sample location identification (soil gas probe, soil boring, surface sample, monitoring well boring, etc.);
2) date sample was collected and screened;
3) sample interval depth; and
4) results from field screening (concentration and units).

10.2 Soil Sample Laboratory Analytical Results

The table must include:

5) sample location identification;
6) date sample was collected;
7) sample depth;
8) target compounds;
9) concentrations of compounds detected; and
10) Method Detection Level (MDL) for each compound

10.3 Groundwater Screening (Groundwater Survey)

The following information must be included:

1) sample location identification;
2) date sample was collected and screened;
3) sample collection depth;
4) screening method used: and
5) compounds and concentrations (and units) detected during screening.

10.4 Well Completion Information

The following information must be included:

1) well identification;
2) ground surface elevation;
3) surveyed top of casing/measuring point elevation;
4) screen length;
5) top and bottom of screen elevations;
6) top of filtered sand;
7) top of bentonite seal;
8) total depth of well;
9) static water level elevation;
10) date of static water level measurement;
11) soil classifications; and
12) geologist's notes/descriptions (i.e., visibly stained soil at 6-8', odor).

10.5 Well Purging Data

The following data collected during purging of wells for sampling must be included:

1) date purged;
2) odors, sheen or product present;
3) volumes purged;
4) purge volume or rate; and
5) parameter measurement values collected after each purge volume or rate (temperature, pH, conductivity, turbidity, dissolved O_2, etc. - successive parameter measurements should demonstrate stabilization prior to sample collection).

10.6 Ground Water Analytical Results

The following information must be included:

1) well identification;
2) date sampled;
3) target compounds;
4) concentrations of contaminants detected;
5) Method Detection Limit (MDL) for each compound; and
6) appropriate data validation qualifiers.

10.7 Comparison of Analytical Results to Regulatory Cleanup Values

Tabulate the results that exceed the unrestricted and restricted Target Remediation Goals (TRGs) values separately for each media (soil, surface water, sediment, groundwater) investigated. Method Detection Limits (MDL) that exceed the TRGs must also be presented.

10.8 Unsaturated and/or Saturated Zone Hydrogeological Testing Results

Tabulate the results from vadose zone and/or aquifer testing.

10.9 Adjacent/Impacted Property Information

Tabulated information pertaining to the adjacent properties and impacted properties must be included. The table must include the following information:

1) Property Owner (Name, Address, Telephone, if available)
2) History of Site Activities, if available
3) Known or suspected releases that may impact the Site

11.0 Figures

The following items must be included in the Report.

11.1 Site Location (Topographical) Map

Include a figure based on a USGS 7.5" Quadrangle depicting the property location. Surface water bodies and topography should be identified and the map must include North Arrow, Scale, and Map Source labels.

11.2 Adjacent/Impacted Property Map

Include a figure depicting the adjacent and impacted properties that has been cross-referenced with the tabulated data in Section 10.8. Show local land use, including schools, hospitals, retirement homes, residential areas, commercial areas, etc., and **any drinking water supply wells. Indicate areas of ecological interest and include** North Arrow, Scale, and Map Source labels.

11.3 Site Plan View

Include a Site Map that depicts the entire property, including property boundaries, buildings, buried tanks, conduits, surrounding properties, potential source areas, potentially impacted receptors, and other pertinent features. The map must include North Arrow, Scale, and Map Source labels.

11.4 Sample Location Map(s)

Include a sampling location map that depicts locations of monitoring wells; soil borings; soil gas and ground water survey probe locations; surface soil sampling locations; etc. Prepare separate maps for sampling locations, if necessary, to make map legible; e.g., separate maps for monitoring well locations versus ground water survey probe locations. The map(s) must include North Arrow, Scale, and Map Source labels.

11.5 Potentiometric Surface Map

Include a Potentiometric Surface Map. Control points must be labeled. Data such as static water level elevations at control points must be depicted on the map. The map must include North Arrow, Scale, and Map Source labels.

11.6 Geologic Cross Sections

Include Geologic Cross Sections that show site stratigraphy through full depth of potentially impacted water-bearing units, including underlying confining layer. Prepare a minimum of three cross-sections per site (i.e., one parallel to groundwater flow direction and two perpendicular to flow direction). Indicate contaminant location, monitoring wells depicting their screened intervals, and subsurface conduits/piping, etc. depicting the subsurface of the property. The cross sections should be oriented longitudinally and transversely with respect to the orientation of soil and/or ground water contaminant plumes. The potentiometric surface should be depicted on the cross section. The map must include North Arrow, Scale, and Map Source and Contaminant Concentration Unit labels.

11.7 Soil Contamination Extent Maps

Include Isocontour maps of soil analytical data with, at a minimum, isocontours labeled for Restricted and Unrestricted contaminant concentration levels. The maps must be plan views and cross-sectional views of the site. The map must include **North Arrow, Scale, and Map Source and Contaminant Concentration Unit labels.**

11.8 Groundwater Contamination Isoconcentration Maps

Include Isoconcentration maps depicting the extent and degree of ground water contamination. It may be necessary to prepare an isocontour map for each contaminant, suite of contaminants, and total contamination. Include at least three isocontour labels for each contaminant. One of the isocontours must be the groundwater Target Remediation Goal for each contaminant. The map must include North Arrow, Scale, and Map Source and Contaminant Concentration Unit labels.

11.9 **Separate Phase Product Isopach Map**

If separate phase product is encountered, a map depicting product extent and thickness must be provided. The map must include North Arrow, Scale, and Map Source labels.

11.10 **Groundwater Plume Trends** (if more than one set of data are available)

Show trend of relevant contaminants detected in groundwater wells as a function of time. The figure must be an X-Y Line graph with Time on the X-Axis and Concentration on the Y-Axis.

11.11 **Water Wells Map**

Include a map depicting all known water wells within two (2) miles from any portion of the MCL isocontour of the groundwater plume. The radius of influence for each water well should be depicted, if available. Estimate if no data is available.

11.11 **Site Conceptual Exposure Models (SCEM)**

A final BASELINE SCEM must be developed for the site for conditions as they currently exist and a REMEDIAL SCEM must be developed for Site conditions after planned remediation.

12.0 Appendices

Appendices containing the following material, **as applicable**, must be included in the Report. Appendices that contain other pertinent material should be developed and included as necessary.

12.1 Include soil boring and monitoring well construction logs. Logs must include notes concerning what is encountered and soil classifications (i.e.,"moist sandy clay with visible staining and petroleum odor at 6-8' interval").

12.2 Include soil gas or ground water survey analytical reports and QA/QC results.

12.3 Include laboratory analytical reports for soil sample analysis.

12.4 Include laboratory analytical reports for ground water analysis.

12.5 Include data validation and usability summary.

12.6 Include vadose zone or aquifer testing data and parameter estimation calculations.

12.7 Include vadose zone or ground water flow modeling data and results.

12.8 Include pertinent correspondence such as communications with regulatory agencies relative to permitting, waste characterization and disposal, etc.

12.9 Photographs may be included such as photographs of property features, investigative activities, etc. Photographs are useful in providing additional documentation of the investigations conducted.

12.10 Original prints of historical areal photographs should be included, if available.

12.11 Include Field Equipment Calibration Verification. Provide certification for each piece of field equipment that was utilized which demonstrates that each piece was calibrated prior to being used.

HERCULES

Hercules Incorporated
Hercules Plaza
1313 North Market Street
Wilmington, DE 19894-0001
(302) 594-5000

May 21, 1999

VIA OVERNIGHT

Mr. Brian Young
Project Manager
Office of Pollution Control
Mississippi Department of Environmental Quality
101 West Capitol Street
Jackson, Mississippi 39289-0385

Re: May 7, 1999 Meeting with the MDEQ
Hercules Inc. Hattiesburg Plant

Dear Mr. Young:

Hercules, Inc. (Hercules) appreciated the opportunity to meet with the Mississippi Department of Environmental Quality (MDEQ) to discuss the current status of implementation of the remedial investigation activities at the Hattiesburg plant and the project objectives and goals. Those present at the meeting included Mr. Tony Russell and Mr. Brian Young of the MDEQ, Mr. Walter Langhans, Mr. Charlie Jordan, and Mr. Tim Hassett of Hercules, Inc., and Mr. Caleb Dana of Eco-Systems, Inc. The following is a summary of the highlights of the meeting and our understanding of the agreements made.

Hercules appreciated the previous MDEQ agreement to move forward with the project initiation in order to avoid further delay. Installation of piezometers across the site began on April 28, 1999 and was completed on April 30, 1999. Surveying the top of the monitoring well casings and installation of survey bench marks for future surveying needs were performed the following week on May 4, 1999. Surveying was completed at the site on May 7, 1999.

Hercules reiterated its desire in the meeting to obtain a consensus between the MDEQ and Hercules on the project objectives and scope of activities. In light of the December 21, 1998 meeting with the MDEQ, Hercules had understood that the focus of investigation would be in regards to potential groundwater impact from Dioxathion and potential for off-site migration. Based on this, Hercules prepared the remedial investigative work plan for the site with the objective of investigating the potential for groundwater impact moving off-site of the plant boundary, and investigate back inward toward potential source areas, as appropriate or needed. Based on the discussions during this meeting and the agreements reached, Hercules will investigate source areas within the sludge pits, the former industrial landfill, and the former production areas at the same time that the groundwater monitoring wells are installed during the Task III field work of new monitoring well installation. The scope of the source area soil investigations will be as presented in the approved work plan addendum dated March 16, 1999. Soil and groundwater sampling will focus on Dioxathion as specified in the soil and groundwater sampling protocols developed between the Mississippi State Chemical Laboratory and Hercules.

This approach will also allow for shortening the timeframe for performing the field investigation and reporting. Final reporting should be accomplished by the end of October 1999, approximately 185 days from the initiation of the project field work begun on April 26, 1999. The MDEQ stated their desire to have a Remedial Action Plan or a site Closure Plan by the end of the calendar year, and that an Agreed Administrative Order reflecting industrial site exposure criteria may be appropriate, depending on site conditions found.

In conjunction with this schedule, a map of the initial groundwater flow contours and patterns is attached for your information. The final selected proposed locations for the placement of monitoring wells will be submitted next week for the MDEQ concurrence.

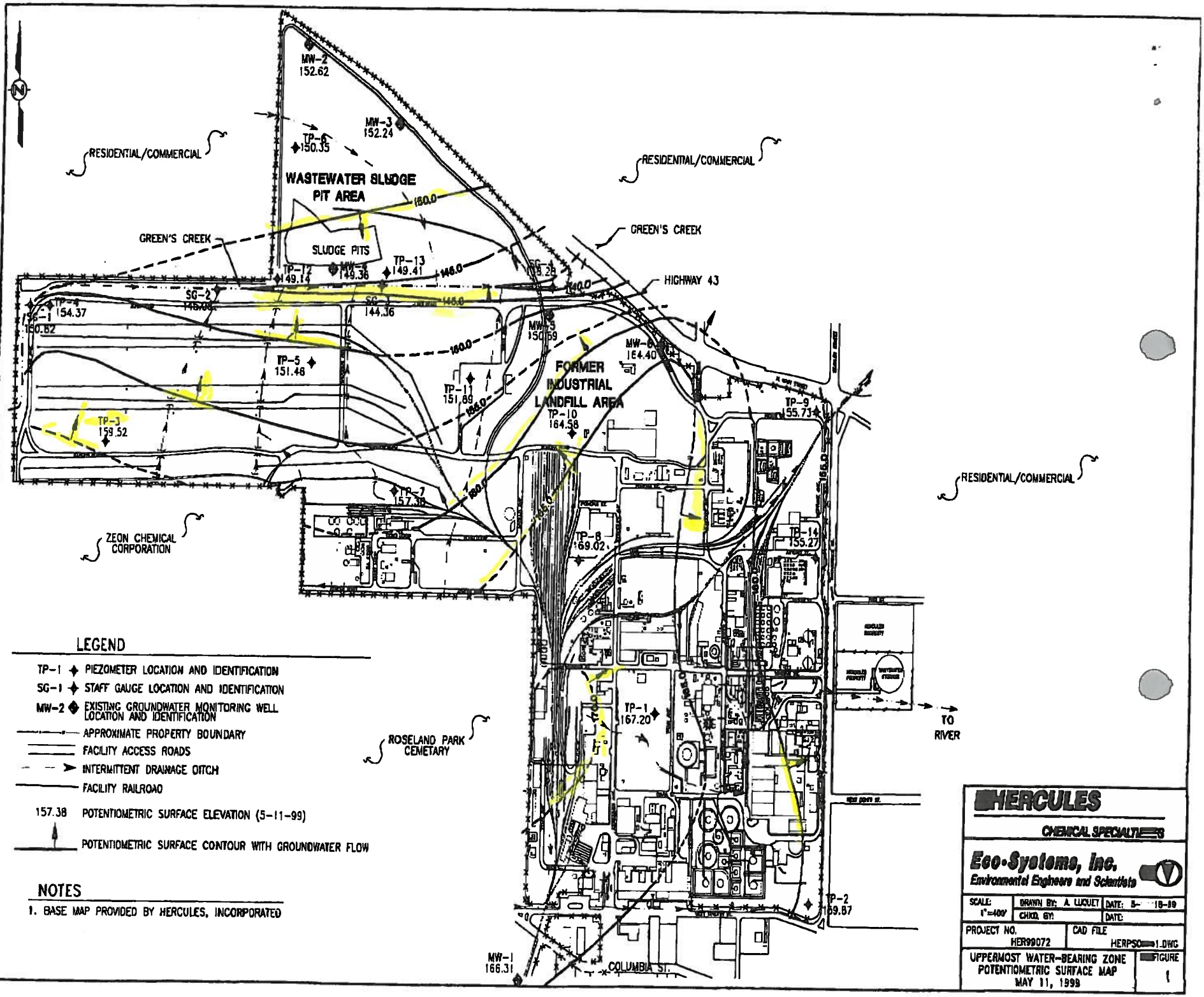
Hercules intends to utilize Bonner Analytical Testing Company in Hattiesburg as its analytical laboratory. As part of preparation for the upcoming analyses, Hercules and Bonner need to receive a sample of the dioxathion standard from MSU. Bonner will collect samples of clean matrices to run the appropriate MDL/PQL studies. The date for split sample collection of monitoring wells MW-4 and MW-5 will be coordinated with the MDEQ.

Please advise us if we have satisfactorily presented the agreements reached in the meeting. We feel that the meeting was very productive and useful. Again, we appreciate the consideration provided to us. It is our intent that the environmental conditions at the site be protective of human health and the environment, and we will take actions to achieve that goal. As indicated in the meeting, the Hercules Hattiesburg plant will investigate solid waste permitting issues. Please contact me at (302) 594-7656 or Mr. Charlie Jordan at (601) 545-3450 if you have any questions.

Very truly yours,

Timothy D. Hassett
Hercules Incorporated
Staff Environmental Engineer

w/attachments
cc: T. Russell - MDEQ
C. S. Jordan - Hercules Hattiesburg
W. D. Langhans - Hercules Hattiesburg
B. J. Hough - Hercules, SH&E
F.J. Carlin - Hercules RC
G.R. Trovei - Hercules, SH&E
C. H. Dana - EcoSystems
M.S. Bonner - Bonner Analytical


MW-2
152.62
MW-3
152.24
TP-6
150.35
RESIDENTIAL/COMMERCIAL
WASTEWATER SLUDGE
PIT AREA
SLUDGE PITS
GREEN'S CREEK
TP-12
149.14
MW-4
149.36
TP-13
149.41
SG-2
145.08
SG
144.36
HIGHWAY 43
TP-4
154.37
SG-1
150.82
TP-5
151.46
MW-5
150.59
MW-6
164.40
FORMER
INDUSTRIAL
LANDFILL AREA
TP-10
164.58
TP-11
151.89
TP-9
155.73
TP-3
159.52
TP-7
157.38
ZEON CHEMICAL
CORPORATION
TP-8
169.02
TP-14
155.27
TP-1
167.20
ROSELAND PARK
CEMETARY
TO
RIVER
TP-2
159.87
MW-1
166.31
COLUMBIA ST.
LEGEND
TP-1 PIEZOMETER LOCATION AND IDENTIFICATION
SG-1 STAFF GAUGE LOCATION AND IDENTIFICATION
MW-2 EXISTING GROUNDWATER MONITORING WELL LOCATION AND IDENTIFICATION
APPROXIMATE PROPERTY BOUNDARY
FACILITY ACCESS ROADS
INTERMITTENT DRAINAGE DITCH
FACILITY RAILROAD
157.38 POTENTIOMETRIC SURFACE ELEVATION (5-11-99)
POTENTIOMETRIC SURFACE CONTOUR WITH GROUNDWATER FLOW
NOTES
1. BASE MAP PROVIDED BY HERCULES, INCORPORATED
HERCULES
CHEMICAL SPECIALTIES
Eco-Systems, Inc.
Environmental Engineers and Scientists
SCALE: 1"=400'
DRAWN BY: A. LUQUET
DATE: 5-18-99
CHKD. BY:
DATE:
PROJECT NO. HER99072
CAD FILE HERPS01.DWG
UPPERMOST WATER-BEARING ZONE POTENTIOMETRIC SURFACE MAP MAY 11, 1999
FIGURE 1
A.L. 05/18/1999 16:18 E:\DRWG\HERC\HERPS01
ECO SYSTEMS INC
002

Brian Young
05/11/99 11:11 AM

To: larry@cyber1.mscl.msstate.edu
cc: Tony Russell/HW/OPC/DEQ@DEQ
Subject: Sampling for Dioxathion in Soil

Dear Dr. Lane:

Here is the sampling protocol developed by Hercules for sampling soils for Dioxathion Dioxsoil.d

Please review and comment at your convience. Thank-you for your help and expertise.

Brian Young

Per telephone conversation with Dr. Lane and Rubel Cowart of the Mississippi State Chemical Laboratory, they find the method acceptable and have no comments.

Brian Young WB
27 May 99

"Timothy D Hassett" <thassett1@herc.com> on 05/11/99 09:10:52 AM

To: Brian Young/HW/OPC/DEQ
cc: ecosys@earthlink.net, fcarlin@herc.com, cjordan@herc.com, wlanghans@herc.com
Subject: Soil Protocol

Bryan

As discussed in our meeting last week, attached is the draft soil protocol. Please provide any comments by phone or e-mail. TDH

 - soilprot.dot

SAMPLING AND ANALYSIS PROTOCOL FOR THE
DETERMINATION OF DIOXATHION IN SOIL

This document addresses the collection and analytical protocol for soil/sediment/solid matrix samples collected at the Hercules, Inc. facility located in Hattiesburg for laboratory analysis for Dioxathion. The objective of the protocol is to provide a written procedure to assure consistency of laboratory analyses between multiple laboratories and documentation of procedures. This protocol amends and supplements the protocol previously established for laboratory analysis of water samples for this project, which was incorporated into the project Work Plan dated February1999. This protocol is intended to be incorporated in the project Work Plan and is hereby incorporated by reference.

1.0 SAMPLE COLLECTION

Soil samples will be collected using stainless steel equipment (e.g. hand augers, split spoons samplers, etc.). After collection, all sample handling should be minimized. Investigators should use extreme care to ensure that samples are not cross-contaminated. Samples will be placed in an ice chest, in a manner to ensure that melted ice cannot cause the sample containers to become submerged, as this may result in sample cross-contamination. Double plastic bags, such as Zip-Lock® bags or similar plastic bags sealed with tape, will be used when small sample containers are placed in ice chests to prevent cross-contamination.

Soil samples will be mixed thoroughly, by quartering, in stainless steel or glass bowls to ensure that the sample is as representative as possible of the sample media. The quartering procedure should be performed as follows:

The material in the sample should be divided into quarters and each quarter should be mixed individually.

Two quarters should then be mixed to form halves.

The two halves should be mixed to form a homogeneous matrix.

This procedure will be repeated several times until the sample is adequately mixed. If round bowls are used for sample mixing, adequate mixing is achieved by stirring the material in a circular fashion, reversing direction, and occasionally turning the material over.1

The large soil sample will be sub-sampled for submission to the analytical laboratories. After the soil sample in the large container has been thoroughly mixed, equal amounts of soil will be placed into each glass sample jar. The sample jars will have Teflon-lined screw caps. Each jar will be labeled in accordance with the procedure specified in the Work Plan. This procedure will be repeated for each soil sample location.

Soil samples collected from selected locations will be submitted in duplicate to each laboratory. That is, two separate sample jars from each location will be filled and sent to each laboratory for analysis. Selection of soil sample locations for splitting samples will be coordinated with the Mississippi Department of Environmental Quality.

2.0 EXTRACTION OF SAMPLES

All samples will be extracted with 1:1 hexane/acetone mixture following the details described in the latest revision of U.S. EPA SW-846 Method 3540, "Soxhlet Extraction." The solvent should be exchanged into hexane, and all extracts will be adjusted to a final volume of ten milliliters (10 mL) before analysis.

3.0 CLEANUP OF EXTRACTS

In order to minimize interferences in the determination of dioxathion, sample extracts that appear to contain interferences will be cleaned up using the latest revision of U.S. EPA SW-846 Method 3620, "Florisil Cleanup." The volume of eluting solvent necessary for quantitative recovery of dioxathion from the Florisil column will be determined in each laboratory using the dioxathion reference standard supplied for calibration of the GC methods.

4.0 SULFUR CLEANUP

If there is significant interference from sulfur compounds, the extracts may be cleaned up according to U.S. EPA SW-846 Method 3660, tetrabutylammonium sulfite option.

5.0 ANALYSIS OF EXTRACTS

All sample extracts will be analyzed by gas chromatography (GC) using a flame photometric detector (FPD), operated in the phosphorus-specific mode, according to the latest revision of U.S. EPA SW-846 Method 8141. A five-point calibration curve will be used to calculate the results of analyses. The lowest point on the calibration curve should be equal to, or slightly higher than, the limit of detection of the GC-FPD system. The highest point on the calibration curve should be the end of the linear portion of the FPD response profile. All laboratories will follow the QA/QC criteria described in the analytical method. Those results will be stored at each laboratory for review at a later date, if necessary.

GC column: 30-meter X 0.53-mm ID DB-5 fused silica capillary column.

GC oven and injector conditions: As necessary for desired results.

Internal Standard: Chlorpyrifos

6.0 CONFIRMATION OF ANALYSES

For qualitative and quantitative confirmation of the dioxathion results, all sample extracts will be analyzed by gas chromatography-mass spectrometry (GC-MS) using the latest revision of U.S. EPA SW-846 Method 8270, or an equivalent mass spectrometry system that is deemed appropriate to give equivalent results. A five-point calibration curve will be used to calculate the results of analyses. The lowest point on the calibration curve should be equal to, or slightly higher than, the limit of detection of the GC-MS system. The highest point on the calibration curve should be the end of the linear portion of the MS detector response profile. All laboratories will follow the QA/QC criteria described in the analytical method. Those results will be stored at each laboratory for review at a later date, if necessary.

GC column: 30-meter X 0.25-mm (or 0.32-mm) DB-5 fused silica capillary column, as specified in Paragraph 4.1.2 in U.S. EPA SW-846 Method 8270.

GC oven and injector conditions: As specified in Paragraph 7.3 in SW-846 Method 8270.

The specifications given in Method 8270, Section 4.0, "APPARATUS AND MATERIALS," and Section 5.0, "REAGENTS," will be followed. The guidance in Section 7.0, "PROCEDURE" will be used to perform the GC separations and GC/MS identification and quantitation. Specific criteria for peak identification are given in Section 7.6 of the method. The characteristic ions, both primary and secondary ions, listed in Table 1 of the method will be used.

For dioxathion, the primary ion is m/z 97 with secondary ions at m/z 125, 270, and 153. Instrument tuning criteria are given in Table 3 of the method. For the Internal Standard, chrysene-d12 is recommended because it meets the retention time criteria set forth in Section 7.3.2.

7.0 GENERAL COMMENTS

a.) All samples will be extracted and analyzed within the normal holding times for organophosphorus compounds.

b.) The dioxathion standard to be used by all laboratories will be supplied by the Mississippi State Chemical Laboratory.

c.) All results of analyses and all confirmatory results will be reported to MSDEQ, who will collate them and distribute the results to the participating laboratories.

Department of Environmental Quality
Meeting Attendees List

Date: May 6, 1999

Company or Site: Hercules, Inc. Hattiesburg, MS

Location of Site: Capitol Centre Conference Room

Participant	Company or Organization	Phone Number
Tony Russell	MDEQ	601-961-5318
Brian Young	MDEQ	601-961-5069
Chris Hawkins	MDEQ	601-961-5775
WALT LANGHAMS	HERCULES INC	601-584-3220
Charlie Jordan	Hercules Inc	601-545-3450
Tim Hassett	Hercules Incorporated	302-594-7656
CALEB DANA	ESI	601 936 4440

AGENDA

Hercules/MDEQ Meeting
May 6, 1999

I. Current Status of Field Work Implementation

- Installation of Piezometers
- Review of Zeon Chemical Groundwater Data

II. Project Objectives

- Protection of Human Health and the Environment
- Investigative Approach

III. Project Issues

- Analytical Protocol
- Analytical Parameters
- Source Sampling
- Schedule

IV. Next Actions

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
James L. Palmer, Jr., Executive Director

April 5, 1999

Mr. Charles S. Jordan
Environmental Coordinator
Hercules, Inc.
P.O. Box 1937
Hattiesburg, Mississippi 39403-1937

Re: Hercules, Inc.
Site Investigation Work Plan dated February 1999
Addendum 1 - Task IV dated March 16, 1999
Hattiesburg, Mississippi

Dear Mr. Jordan:

The Mississippi Department of Environmental Quality (MDEQ) has completed a review of the above referenced documents. The Site Investigation Work Plan (including Addendum 1) is approved with the following conditions:

1. The time schedule outlined in the Work Plan (including Addendum 1) is unnecessarily long (217 days). Therefore, the work proposed in Addendum 1 (Task IV) shall be completed at the same time as Task II. Analytical data from the soils and groundwater can then be used to guide any groundwater investigations necessary in Task III.

2. The MDEQ requires that comments 2, 3 and 5 in MDEQ's letter dated February 23, 1999, shall be complied with.

If you should have any questions or comments, you may contact Brian Young at (601) 961-5069.

Sincerely,

Tony Russell, Chief
Uncontrolled Sites Section

A:\Hercules RIP Approval.wpd

OFFICE OF POLLUTION CONTROL
P.O. Box 10385 Jackson, MS 39289.0385 Phone 601.961.5171 Fax 601.354.6612

Eco·Systems, Inc.
Consultants, Engineers and Scientists

March 16, 1999

Mr. Brian Young
Mississippi Office of Pollution Control
P.O. Box 10385
Jackson, Mississippi 39289

RE: Addendum 1- Task 4 for Site Investigation Work Plan
Hercules, Inc. Site - Hattiesburg, Mississippi

Dear Mr. Young:

Eco·Systems, Inc. is pleased to present one (1) copy of Addendum 1 - Task 4 for Site Investigation Work Plan. This addendum may be placed with the Site Investigation Work submitted to to the Mississippi Department of Environmental Quality on February 16, 1999. Please review and provide comment. Hercules is currently preparing to initiate field activities associated with Tasks I through Task III following the MDEQ approval of the Work Plan. Hercules will coordinate with the MDEQ regarding the details at least one (1) week in advance of mobilization.

If you have any questions, please call Mr. Charles Jordan at (601) 545-3450.

Very truly yours,
Eco·Systems, Inc.

John M. Ryan
Project Scientist

Caleb H. Dana, Jr., P.E., CHMM
Principal Engineer

cc: Mr. Tony Russell
Mr. Charles Jordan
Mr. Timothy Hassett

Enclosure

4294 Lakeland Drive, Suite 200 • Jackson, MS 39208 • Phone (601) 936-4440 • Fax (601) 936-4463

ESI

WORK PLAN ADDENDUM 1
SOURCE AREA CHARACTERIZATION (TASK IV)
HERCULES, INC.
HATTIESBURG, MISSISSIPPI

INTRODUCTION

Eco·Systems, Inc. (*Eco·Systems*) has been commissioned by Hercules, Incorporated (Hercules) to develop a remedial investigation strategy for conducting soils' characterization at the Hercules plant located in Hattiesburg, Mississippi (the Site). This work may be implemented to further investigate and screen for the potential of Dioxathion in source area(s) associated with the former production area at the Site. Dioxathion, the active ingredient of the product Delnav™ manufactured by Hercules, has been detected downgradient of potential waste disposal source areas. This addendum has been developed to supplement the investigative tasks presented in the Site Investigation Work Plan ((Work Plan), *Eco·Systems, Inc.*, February, 1999) as a conditional requirement following Work Plan approval by the Mississippi Department of Environmental Quality (MDEQ).

The necessity for implementing the characterization approach detailed in this addendum will be determined based on evaluation of the characterization data collected during Task I through Task III. Task I through Task III include:

- **Task I** - Collect split groundwater samples from existing monitoring points MW-4 and MW-5 to reconfirm the presence of Dioxathion in this area;
- **Task II** - Further define the Site's hydraulic flow regime, including flow direction and velocity, representative of the uppermost water-bearing zone and associated surface water (Green's Creek); and
- **Task III** - Further characterize the extent of Dioxathion impact to groundwater and refine the hydrogeologic model.

This Work Plan Addendum outlines the objectives and technical approach of the proposed additional characterization; describes the field methods and sampling procedures to be implemented; outlines the reporting that will be performed; and presents an anticipated schedule for completion of the investigative tasks. The Work Plan will be referenced throughout for any component that coincides with this addendum.

TECHNICAL APPROACH

The general objective of this investigation is to collect information regarding the potential source(s) of Dioxathion that may be releasing to environmental media that may have contained Dioxathion. Characterization data collected during Task I through Task III will be used to refine and focus the proposed additional characterization activities of Task IV. This additional information will be used in concert with previously collected data to

characterize the environmental conditions representative of the Site and develop potential management alternatives. Specifically, the proposed additional source area investigation objectives are as follows:

- Screen surficial soils, landfilled debris, sludge pit material and/or native soils for Dioxathion-impact and identification of potential source areas; and
- Determine the lateral and vertical extent of potential source areas to better guide selection of potential management alternatives.

The following sections describe the proposed sampling scope of work, numbers and locations of samples, collection methods and procedures, and laboratory analysis.

SOILS CHARACTERIZATION

As illustrated in Figure 1, the proposed soils characterization is outlined for each area of concern below as well as characterization activities common to each area. Sampling in each area of concern will be focused on near-surface soils and/or landfilled debris. Field screening techniques (organic vapor analyzer and visual observation) will be utilized to guide in evaluation of conditions in the field. Native soils underlying the waste matrix in each area of concern may be qualitatively screened in select borings. However, if saturated conditions are identified, the boring will be immediately terminated and sealed to the surface in order to avoid creating a conduit to the groundwater. This investigative strategy is presented as a preliminary approach and will be refined based on evaluation of the results obtained during initial phases of Site characterization. Boring placement in each area of concern will be focused to specific locations accordingly in the field. In addition, the number of borings may be adjusted based on conditions encountered in the field. Specifically, the following activities are proposed for each area:

Soil Characterization Common to All Areas

- Conduct continuous soil sampling for lithologic description and Dioxathion analysis on two (2) foot centers until native soils and/or the uppermost water-bearing zone is encountered;

Former Delnav Production Area

- Complete three (3) borings (SB-1 and SB-3) in the former production area and conduct continuous two-foot sampling for Dioxathion in soils overlying groundwater.

Former Industrial Landfill Area

- Complete three (3) borings (SB-4 through SB-6) within the former industrial landfill into native soils underlying the landfilled debris and/or uppermost water-bearing zone.

- Complete four (4) exploratory trenches (LB-1 through LB-4) on the anticipated outer edge of the landfill to establish the potential lateral boundary of waste disposal. Additional trenches may be necessary to adequately define the boundary.

Sludge Pit Disposal Area

- Complete four (4), equally-spaced borings (SB-7 through SB-10) within the disposal area into native soils underlying the sludge matrix.

METHODS AND PROCEDURES

Soil Sampling

As detailed in the Work Plan, samples for lithologic description will be collected with a hydraulic probing apparatus (Geoprobe™, or similar) from each interval in each boring. Such units are designed to expedite boring advancement and sample collection, as well as to minimize or eliminate the generation of soil cuttings. Soil cores collected from the placement of borings will be visually described for lithologic analysis and used to update existing geologic cross-sections across the areas of concern. Soil boring techniques, sample collection and description, will be repeated for each sampling location and logged on Soil Boring Logs provided in Appendix A - Field Data Collection Forms of the Work Plan. A detailed sampling and analytical protocol is currently being developed for analysis of Dioxathion in soil. This protocol will be submitted to the MDEQ for approval. The approved soil analytical protocol will be incorporated into this addendum as Attachment A.

Soil samples will be collected from each boring on a continuous basis (two-foot intervals) for field screening using visual observation and "headspace" analysis. If impacted material is identified in a particular boring based on field screening techniques, subsequent borings may be placed accordingly in an effort to define the lateral extents of the impacted material. *Borings will not be extended below the waste material, to avoid creating a potential conduit to underlying groundwater.* A representative portion of sample from each interval will be placed into a pint-sized, sealed Ziploc™ bag, desegregated to increase the surface area, and monitored for organic compounds after a set amount of time (e.g., five minutes). "Headspace" readings will be recorded by inserting a commercial, portable organic vapor detector into the bag and reading the maximum concentration of total organic compounds. A soil sample for Dioxathion analysis will be collected from each two (2) foot interval within the waste matrix in each boring. Additional samples for Dioxathion analysis may be collected, depending of Site conditions. The soil samples will be collected as follows.

A portion of the soil recovered from the selected sampling interval will be placed into a clean stainless-steel bowl and mixed thoroughly until a homogeneous, lump-free mixture is obtained. A representative portion of this mixture will be sealed in a clean, laboratory-supplied 8-ounce glass jar with a screw-on Teflon-lined lid for laboratory

analysis. This sample jar will then be labeled, sealed in a plastic bag, and placed on ice in a laboratory-supplied cooler. Soil probing and sample collection will be repeated for each boring location or sampling interval. Subsequent to collection, the soil samples will be shipped to the designated laboratory for analysis of Dioxathion. All boreholes will be grouted to land surface following sampling activities.

Analytical Methods

Geochemical samples will be analyzed by a qualified laboratory using EPA-approved methods. For Dioxathion in soil, EPA SW846 methods will be used. Specifically, extraction and analysis will be accomplished using Methods 3510 and 8141, respectively. As presented in Appendix B - Laboratory Analytical Methods of the Work Plan, a detailed analytical protocol for analysis of Dioxathion in water samples has been developed to assist project and regulatory personnel. A soil analytical protocol will be prepared for analysis of Dioxathion and submitted to the MDEQ for approval. Hercules will obtain the MDEQ's approval prior to performing soil sampling for Dioxathion analysis. The approved soil analytical protocol will be incorporated into Attachment A.

QA/QC Procedures

To attain QA/QC objectives in terms of accuracy, precision, completeness, comparability, and representativeness, QA/QC samples will be collected and sent to the analytical laboratory for analysis. QA/QC samples collected in the field will consist of field duplicates, and equipment rinsate blanks. Field duplicates will be collected at a frequency of one (1) per ten (10) samples per matrix. Split samples will also be collected for regulatory oversight at a frequency of one (1) per ten (10) samples per matrix. Field duplicate and split samples will be collected by initially filling a large glass container of sufficient volume to fill two (2) individual bottles. Following agitation to homogenize the volume, each sample bottle will be filled with alternating aliquots to assure representative replicates for each sample. Equipment rinsate blanks will be collected at a frequency of one (1) per twenty (20) samples per matrix. Equipment rinsate samples will be collected immediately following sampling equipment decontamination by running deionized water through decontaminated sampling equipment and collecting this water in sample containers.

Other Procedures

Procedures for sample containerization and packing, sample shipment, cross-contamination control, sample identification, decontamination, management of investigative-derived waste, field documentation, health and safety, chain-of-custody, and data review will be conducted in accordance with procedures defined in the Site Investigation Work Plan (*Eco·Systems, Inc.*, February, 1999) and EPA Region IV Environmental Investigations Standard Operating Procedures and Quality Assurance Manual (May, 1996).

REPORTING

The MDEQ will be notified at least two (2) weeks prior to conducting the proposed field activities. A report documenting the field activities of Task I through Task IV and the analytical results will be submitted to the MDEQ in accordance with the schedule proposed in the following section. The report will include the following: 1) the project objectives, field methods and procedures; 2) tabular and graphical presentation of the data; and, 3) conclusions and recommendations based on the investigative findings.

ANTICIPATED SCHEDULE

Field activities described herein and submittal of the final characterization report to the MDEQ are anticipated to be completed within approximately 70 days, respectively, of authorization to proceed following submittal of the preliminary report of Task I through Task III investigative findings. This schedule may be adjusted accordingly based on Task I through Task III results. Laboratory results are anticipated to be received three (3) weeks after completion of sampling activities. The estimated schedule for activities anticipated to complete this investigation is shown below.

ACTIVITY	DAYS FROM START
Complete Task IV Field Work (14 Days)	14
Receive Analytical Data (21 Days)	35
Preparation and Submittal of Draft Report to Hercules (21 Days)	56
Submit Final Report to MDEQ (14 Days)	70

However, Hercules may elect to perform the additional characterization described in Task IV in lieu of submittal of a preliminary report. A final report addressing Task 1 through Task IV will instead by submitted in accordance with the above schedule.

LEGEND

LOCATION AND IDENTIFICATION OF EXPLORATORY LANDFILL TRENCH

SOIL BORING LOCATION AND IDENTIFICATION

EXISTING GROUNDWATER MONITORING WELL LOCATION AND IDENTIFICATION

– APPROXIMATE PROPERTY BOUNDARY

FACILITY ACCESS ROADS

INTERMITTENT DRAINAGE DITCH

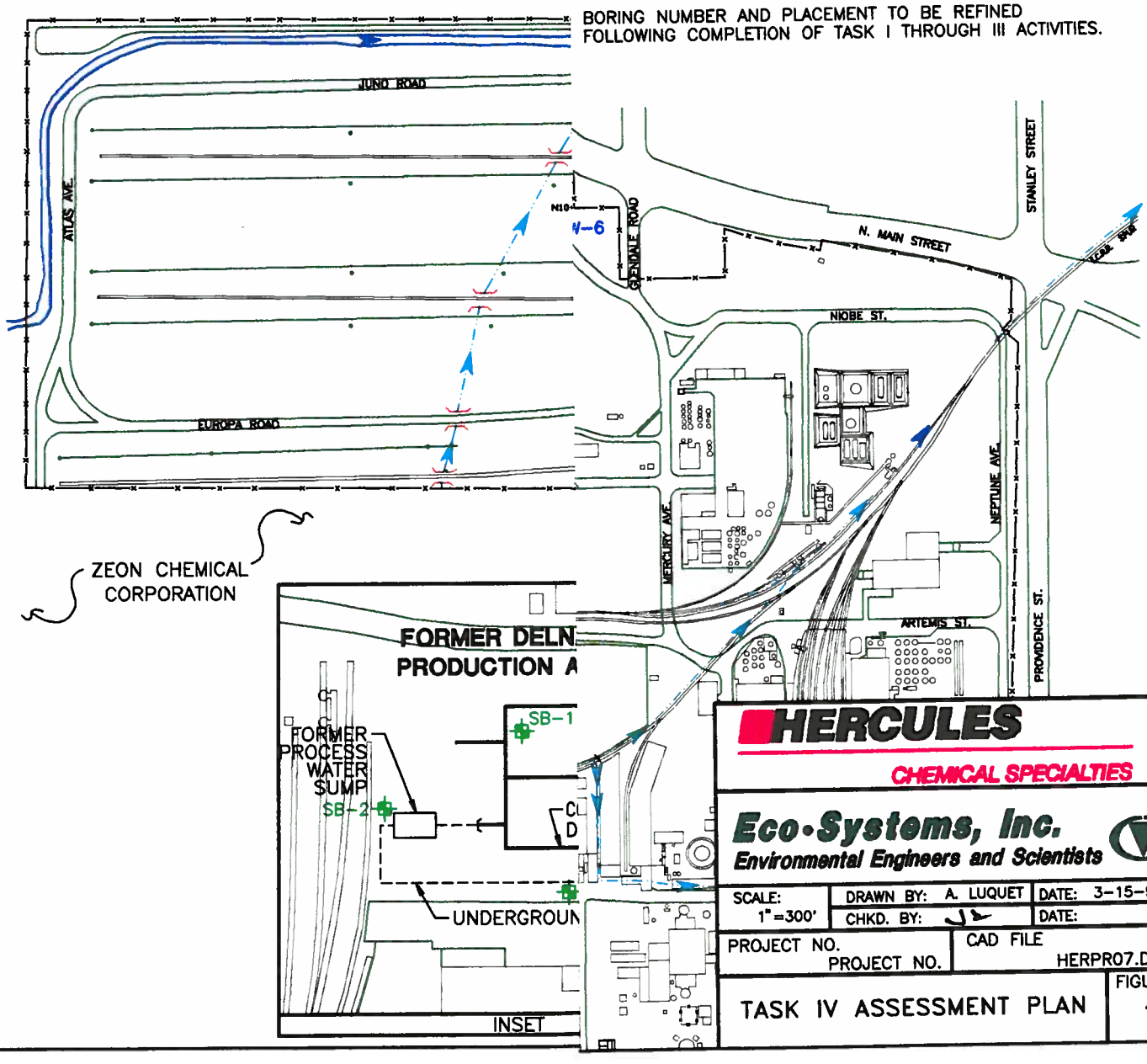
FACILITY RAILROAD

RESIDENTIAL/COMMERCIAL

GREEN'S CREEK

NOTES

BORING NUMBER AND PLACEMENT TO BE REFINED FOLLOWING COMPLETION OF TASK I THROUGH III ACTIVITIES.



HERCULES
CHEMICAL SPECIALTIES

Eco·Systems, Inc.
Environmental Engineers and Scientists

SCALE: 1"=300'	DRAWN BY: A. LUQUET	DATE: 3-15-99
	CHKD. BY:	DATE:
PROJECT NO. PROJECT NO.	CAD FILE HERPR07.DWG	

TASK IV ASSESSMENT PLAN

FIGURE 1

A.L. 03/16/1999 10:06 M:\DRWG\HERC\HERPR07

Eco-Systems, Inc.
Consultants, Engineers and Scientists

March 5, 1999

Mr. Brian Young
Hazardous Waste Division, Superfund Branch, Uncontrolled Sites Section
Mississippi Department of Environmental Quality - Office of Pollution Control
P.O. Box 10385
Jackson, Mississippi 39289-0385

Re: **Response to the Mississippi Department of Environmental Quality (MDEQ) letter dated February 23, 1999**
Site Investigation Work Plan
Hercules, Inc. (Hercules)
Hattiesburg, Mississippi

Dear Mr. Young:

This letter is provided on behalf of Hercules in response to your letter dated February 23, 1999, regarding comments following your review of the above-referenced Site Investigation Work Plan (Work Plan) prepared for Hercules facility located in Hattiesburg, Mississippi. It also reflects our telephone discussion of March 4, 1999 and agreement on steps to implement the Work Plan. Hercules requests that the current Work Plan previously submitted to the MDEQ be approved so that implementation of the work identified therein may begin. Hercules will also prepare an addendum to the Work Plan to address the MDEQ Comment 1 discussed below. Our response has been prepared in the same order and sequence as your comments.

MDEQ Comment 1.

"Section 1.1 states that the purpose of the site investigation plan is to determine if Dioxathion has migrated off-site and to locate the source of the groundwater contamination. However, the Work Plan only addresses characterizing the groundwater of the site, without searching for potential sources of the groundwater contamination. There are at least three obvious potential source areas: the sludge disposal pits, the former Delnav production area, and the former industrial landfill area. Therefore, the MDEQ requires that Hercules submit an addendum to the Site Investigation Work Plan for investigating the soils and sludges in these potential source areas within two weeks of the date of this letter."

Hercules Response:

Hercules will prepare an addendum for investigating the soils and sludges in the potential source areas of the sludge disposal pits, the former Delnav production area, and the former industrial landfill area. The addendum will be prepared and submitted to the MDEQ by March 16, 1999, as agreed on the telephone. The addendum will reflect a new Task IV for this investigation. Hercules would like to complete the groundwater investigations outlined in Tasks I through III of the Work Plan and review the results prior to implementing the field work associated with investigating potential source area soils or sludges. This sequence will also allow for timely implementation of the current Work Plan while the addendum is being prepared and approved. This approach will also be consistent with the project objectives stated in the Work Plan. Hercules does wish to reserve the right to revisit the need to perform such investigations depending on the results of the groundwater sampling and other information developed regarding the site conditions.

MDEQ Comment 2.

"All new monitoring well installations shall be screened in the lower section of the shallow aquifer."

Hercules Response:

Agreed, unless the water bearing zone is not found to be technically or physically amenable to this. Also, screens will not be planned to straddle the potentiometric surface.

MDEQ Comment 3.

"An additional piezometer is requested on the east side of the site between TP-2 and TP-9."

Hercules Response:

Agreed. Hercules requests the MDEQ provide assistance in obtaining Zeon Chemical Company's permission to use one or more of its monitoring wells for piezometric elevations during this investigation. Hercules would also like to evaluate the well construction details of the selected wells to assure monitoring the same water-bearing zones.

MDEQ Comment 4.

"The sample collection procedures outlined in the Work Plan for groundwater are different from the procedures developed as part of the protocol developed by Hercules, Inc., and the Mississippi State Chemical Laboratory. Which procedures does Hercules, Inc. intend to use?"

Hercules Response:

Hercules will utilize the low-flow/low-stress sampling approach versus convention teflon bailer for collecting the necessary water. To prepare split samples, Hercules will collect the sample in a single container, homogenize, and then prepare aliquots in individual sample containers for Hercules and for MSCL for laboratory analysis. The Work Plan will be revised to reflect this approach.

MDEQ Comment 5.

"In general, when using low flow purging and sampling techniques, the MDEQ considers a well ready to sample when the field indicator parameters have stabilized as follows: pH $\pm$ 0.1, temperature $\pm$ 0.5 F, conductivity $\pm$10%, turbidity < 10 NTU's (or $\pm$ 10% if turbidity is high), and dissolved oxygen $\pm$ 10%. The MDEQ requests that dissolved oxygen (DO) be added to the field indicator parameters."

Hercules Response:

Agreed.

MDEQ Comment 6.

"The MDEQ will NOT be providing water samples spiked with Dioxathion for inclusion in this study. If laboratory spiked samples are needed for QA/QC purposes, Hercules should obtain those samples from the laboratory that will be analyzing the samples."

Hercules Response:

Hercules will obtain laboratory-spiked samples for QA/QC purposes if it is determined as necessary.

Additional Comments

Hercules wishes to provide these additional comments for clarification purposes:

1. References to the "up to thirteen (13) piezometers" in the first paragraph of Section 3.2 on page 6 of the Work Plan and the reference to the "approximately 12 piezometers" in the same section below in the "outline of groundwater activities common to all areas" refer to the same piezometers.

2. Hercules wishes to clarify Section 4.8 regarding the "disposal of investigative-derived wastes (IDW) within 14 days of receipt of all characterization data". Hercules intends to profile the IDW as soon as possible for disposal in accordance with all rules and

regulations using Best Management Practices (BMPs). Upon completion of profiling, Hercules intends to schedule the disposal of the IDW in accordance with all rules and regulations with a goal of 14 days. The MDEQ will be advised of the disposal efforts and activities for their concurrence.

Closing

If you have any questions or need further information, please do not hesitate to call me at (601) 545-3450, ext. 360.

Very truly yours,
Eco·Systems Inc.

Caleb H. Dana, Jr., P.E., CHMM
Principal Engineer

c: Mr. Charles S. Jordan, Hercules Inc.
Mr. Timothy Hassett, Hercules Inc.

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
James I. Palmer, Jr., Executive Director

February 23, 1999

Mr. Charles S. Jordan
Environmental Coordinator
Hercules, Inc.
P.O. Box 1937
Hattiesburg, Mississippi 39403-1937

Re: Hercules, Inc.
Site Investigation Work Plan dated February 1999
Hattiesburg, Mississippi

Dear Mr. Jordan:

The Mississippi Department of Environmental Quality (MDEQ) has completed a review of the above referenced document and has the following comments:

1. Section 1.1 states that the purpose of the site investigation plan is to determine if Dioxathion has migrated off-site and to locate the source of the groundwater contamination. However, the Work Plan only addresses characterizing the groundwater of the site, without searching for potential sources of the groundwater contamination. There are at least three obvious potential source areas: the sludge disposal pits, the former Delnav production area, and the former industrial landfill area. Therefore, the MDEQ requires that Hercules, Inc. submit an addendum to the Site Investigation Work Plan for investigating the soils and sludges in these potential source areas within two weeks of the date of this letter.

2. All new monitoring well installations shall be screened in the lower section of the shallow aquifer.

3. An additional piezometer is requested on the east side of the site between TP-2 and TP-9.

4. The sample collection procedures outlined in the Work Plan for groundwater are different from the procedures developed as part of the protocol developed by Hercules, Inc., and the Mississippi State Chemical Laboratory. Which procedures does Hercules, Inc. intend to use?

OFFICE OF POLLUTION CONTROL
P.O. Box 10385 Jackson, MS 39289-0385 Phone 601.961.5171 Fax 601.354.6612

5. In general, when using low flow purging and sampling techniques, the MDEQ considers a well ready to sample when the field indicator parameters have stabilized as follows: pH ± 0.1, temperature ± 0.5 F, conductivity ± 10%, turbidity < 10 NTU's (or ± 10% if turbidity is high), and dissolved oxygen ± 10%. The MDEQ requests that dissolved oxygen (DO) be added to the field indicator parameters.

6. The MDEQ will **NOT** be providing water samples spiked with dioxathion for inclusion in this study. If laboratory spiked samples are needed for QA/QC purposes, Hercules should obtain those samples from the laboratory that will be analyzing the samples.

If you should have any questions or comments, you may contact Brian Young at (601) 961-5069.

Sincerely,

Tony Russell, Chief
Uncontrolled Sites Section

A:\Hercules RIP Comments.wpd

Eco·Systems, Inc.
Consultants, Engineers and Scientists

January 15, 1999

Mr. Brian Young
Hazardous Waste Division, Superfund Branch, Uncontrolled Sites Section
Mississippi Department of Environmental Quality - Office of Pollution Control
P.O. Box 10385
Jackson, Mississippi 39289-0385

Re: Site Investigation Work Plan
Hercules, Inc.
Hattiesburg, Mississippi

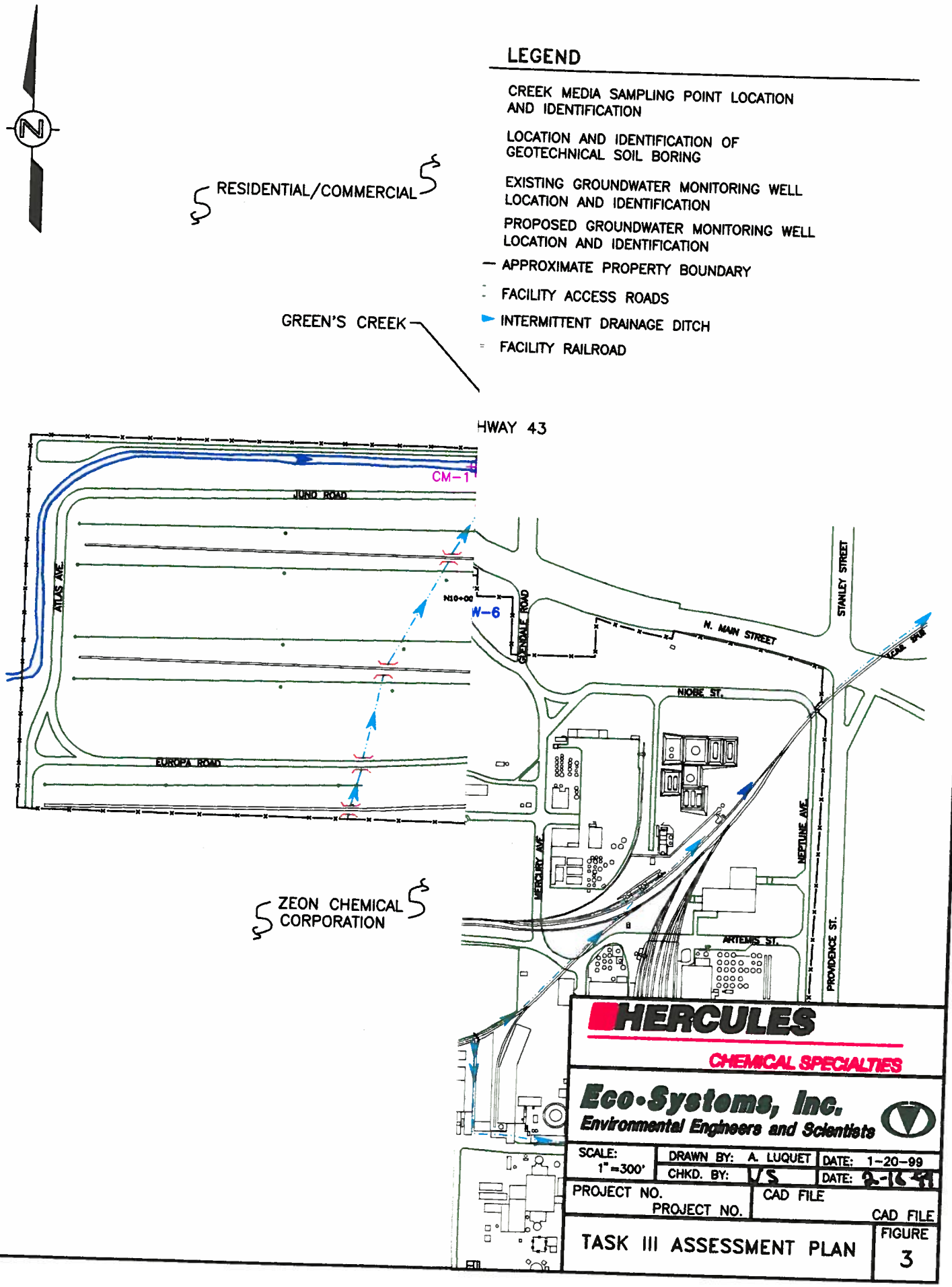
Dear Mr. Young:

Please find enclosed two copies of the revised Figure 3 for inclusion in the above-referenced Work Plan submitted on February 16, 1999 to you and Mr. Tony Russell. If you have any questions, please do not hesitate to call me at 936-4440.

Very truly yours,
Eco·Systems, Inc.

Caleb H. Dana, Jr., P.E., CHMM
Principal Engineer

4294 Lakeland Drive, Suite 200 • Jackson, MS 39208 • Phone (601) 936-4440 • Fax (601) 936-4463



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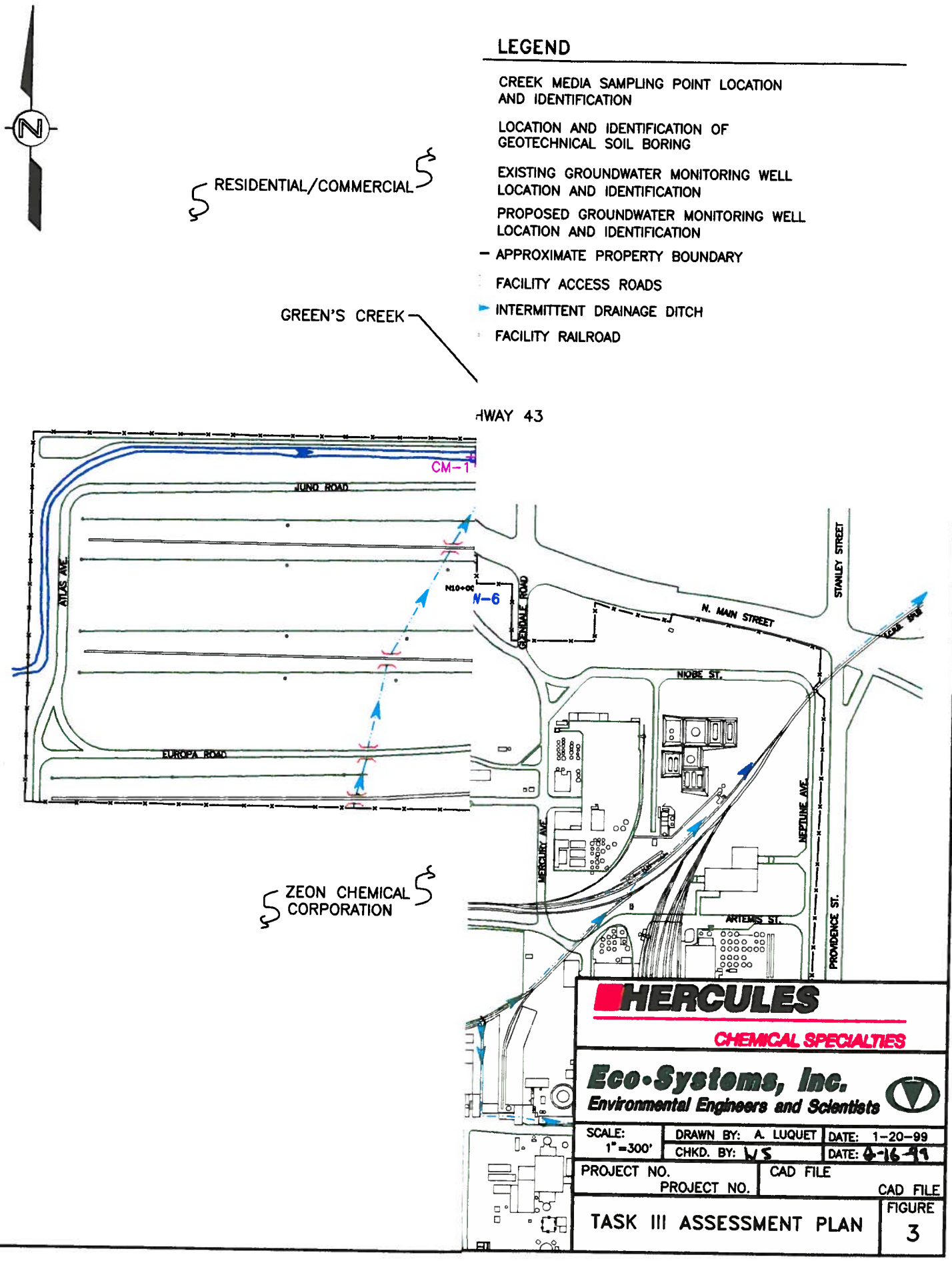


S.M. 02/16/1999 14:00 G:\DRWG\HERC\HERPR06

HERCULES

Hercules Incorporated
613 West 7th Street
P.O. Box 1937
Hattiesburg, MS 39403-1937
(601) 545-3450
Fax: (601) 584-3226

February 17, 1999

CERTIFIED MAIL - RETURN RECEIPT REQUESTED
NO. Z 570 544 125

Brian Young
Office of Pollution Control
P. O. Box 10385
Jackson, MS 39289-0385

"February 17, 1999"

Dear Mr. Young:

Following the phone conversations you and I have had with Caleb Dana, my understanding is that we can discontinue the current round of quarterly well sampling, and instead, move forward with the recently submitted work plan, following your final approval. I trust this meets your satisfaction.

I will cancel the quarterly well sampling that is scheduled for February 24th. The basin cleaning that we discussed is still scheduled for the week of February 22nd.

If I can answer any additional questions please call me at 601-545-3450 ext 360.

Sincerely,

HERCULES INCORPORATED

Charles S. Jordan
Environmental Coordinator

CSJ/vrf

Eco·Systems, Inc.
Consultants, Engineers and Scientists

February 16, 1999

Mr. Brian Young
Mississippi Office of Pollution Control
P.O. Box 10385
Jackson, Mississippi 39289

RE: Site Investigation Work Plan
Hercules, Inc. Site - Hattiesburg, Mississippi

Dear Mr. Young:

Eco·Systems, Inc. is pleased to present the enclosed Site Investigation Work Plan for characterization of the Hercules site in Hatteisburg, Mississippi on behalf of Hercules Inc. for your review.

If you have any questions, please call Mr. Charles Jordan at (601) 545-3450.

Very truly yours,

Eco·Systems, Inc.

for
John M. Ryan
Project Scientist

Caleb H. Dana, Jr.
Caleb H. Dana, Jr., P.E., CHMM
Principal Engineer

cc: Mr. Tony Russell
Mr. Charles Jordan
Mr. Timothy Hassett

Enclosure

4294 Lakeland Drive, Suite 200 • Jackson, MS 39208 • Phone (601) 936-4440 • Fax (601) 936-4463

HERCULES

Hercules Incorporated
613 West 7th Street
P.O. Box 1937
Hattiesburg, MS 39403-1937
(601) 545-3450
Fax: (601) 584-3226

February 10, 1999

CERTIFIED MAIL - RETURN RECEIPT REQUESTED
NO. Z 570 544 121

Brian Young
Bureau of Pollution Control
P. O. Box 10385
Jackson, Ms 39289-0385

Dear Mr. Young:

Please find the following response to your 02/03/99 letter and our 02/10/99 phone conversation as related to the sampling and analysis protocol.

Our prior understanding to provide a sampling protocol did not include soils. As a result, this was not discussed in any of the recent sampling protocol developed between Dr. Larry Lane and Frank Carlin. However, based on your letter we will include the development of a soil sampling protocol in the work plan scheduled to be submitted on 02/16/99.

Based on our phone conversation, I trust this meets your request. If I can answer any additional questions please call me at 601-584-3360.

Sincerely,

HERCULES INCORPORATED

Charles S. Jordan
Environmental Coordinator

CSJ/vrf

cc: Walter D. Langhans, Plant Manager
T. D. Hassett, Environmental Affairs
9282 SW, Wilmington

Tony Russell
01/22/99 07:30 AM

To: Brian Young/HW/OPC/DEQ@DEQ
cc:
Subject: Dioxathion

FYI

---------- Forwarded by Tony Russell/HW/OPC/DEQ on 01/22/99 07:36 AM ----------

"Dr. Larry Lane" <larry@cyber1.mscl.msstate.edu> on 01/21/99 04:48:45 PM

To: "Francis J. Carlin" <fcarlin@herc.com>
cc: Tony Russell/HW/OPC/DEQ
Subject: Dioxathion

>Date: Thu, 21 Jan 1999 10:33:01 -0800
>From: Bert Lynn <blynn@ra.msstate.edu>
>X-Mailer: Mozilla 4.06 [en] (Win98; I)
>To: "larry@cyber1.mscl.msstate.edu" <larry@cyber1.mscl.msstate.edu>
>Subject: Dioxathion
>
>Larry,
>
>Please review the following response to the Hercules email.
>
>Bert
>
>
>Dear Frank,
>
>After reviewing your recent email to Dr. Lane, we have the following
>comments regarding Method 8270C.
>
>Dioxathion is mentioned as a possible analyte by this method however no
>supporting data are included to substantiate this claim. For example,
>while listed in Sec. 1.1 (8270C-3), no "Appropriate Preparation
>Techniques" are provided for dioxathion. No estimated quantitation
>limits (EQLs) are provided for dioxathion in Table 2. No
>multilaboratory performance data are provided for dioxathion in Table
>6. And finally, no method accuracy and precision as functions of
>concentration data are provide for dioxathion in Table 7. Based on the
>above omissions, it is apparent to me that dioxathion has not been
>analyzed in any significant way utilizing this method. Therefore, we
>again propose the application of "good science" in development of a
>suitable protocol for the assay of dioxathion.
>
>Regarding the use of tandem mass spectrometry, even 8270C provides for
>the use of alternative methods. Section 7.5.5 provides for the use of
>SIM for applications requiring lower than normal detection limits. In
>the next sentence, they remark on the loss of confidence resulting from

>the use of SIM. Tandem mass spectrometry, as implemented on a
>quadrupole ion trap, would provide the sensitivity of SIM and the
>selectivity required for high confidence determinations. If involved in
>this study, we would employ ion trap MS/MS. Our current research
>efforts in quadrupole ion trap mass spectrometry have positioned us to
>detect environmental contaminates at levels lower than previously
>considered possible.
>
> Finally in Section 3.1 (Interferences), the method states interferences
>should be identified and "take corrective action to eliminate the
>problem". Tandem mass spectrometry would resolve and eliminate
>potential interferences during the analysis stage.
>
> In conclusion, if involved in this study, we will utilize sound
>scientific principles and techniques to analyze these dioxathion
>contaminates consistent with MSCL QA/QC precedures.
>

DRAFT

SAMPLING AND ANALYSIS PROTOCOL FOR THE DETERMINATION OF DIOXATHION IN WATER

Recent results of analyses of well water samples from the Hercules Incorporated plant in Hattiesburg, Mississippi, have exhibited a wide range in the levels of dioxathion reported. Discussions among representatives from the analytical laboratories demonstrated that the samples analyzed to date were not true split samples and that the analytical methods were applied differently. In order to minimize the effects from different water samples and from inconsistent application of the analytical methods, the following protocol has been assembled by agreement between Hercules Incorporated and the Mississippi State Chemical Laboratory. This protocol will be used in a study to determine the proper sampling and analysis methods to be used for all future water monitoring programs at the Hattiesburg plant.

1.) SAMPLE COLLECTION

Water samples will be withdrawn from the well using a Teflon bailer. The contents of the bailer will be placed into a large glass or Teflon container (one gallon, or more, in size). The container should have a Teflon-lined screw cap. Successive bailers of water will be removed from the well and placed into the container until there is enough water to supply split samples to each laboratory participating in the study. The contents of the large container will then be mixed thoroughly. After the composited water sample in the large container has been mixed, equal amounts of water will be poured into each sample jar. The sample jars should have Teflon-lined screw caps. This procedure will be repeated for each well.

Water samples collected from Wells #4 and #5 will be submitted in duplicate to each laboratory. That is, two separate sample jars from Well #4 and Well #5 will be filled and sent to each laboratory for analysis.

2.) EXTRACTION OF SAMPLES

All samples will be extracted with methylene chloride following the details described in the latest revision of U.S. EPA SW-846 Method 3510. The solvent should be exchanged into hexane, and all extracts will be adjusted to a final volume of ten milliliters (10 mL) before analysis.

3.) CLEANUP OF EXTRACTS

In order to minimize interferences in the determination of dioxathion, sample extracts that appear to contain interferences will be cleaned up using the latest revision of U.S. EPA SW-846 Method 3620, Florisil Cleanup. The volume of eluting solvent necessary for quantitative recovery of dioxathion from the Florisil column will be

determined in each laboratory using the dioxathion reference standard supplied for calibration of the GC methods.

4.) SULFUR CLEANUP

If there is significant interference from sulfur compounds, the extracts may be cleaned up according to U.S. EPA SW-846 Method 3660, tetrabutylammonium sulfite option.

5.) ANALYSIS OF EXTRACTS

All sample extracts will be analyzed by gas chromatography (GC) using a flame photometric detector (FPD), operated in the phosphorus-specific mode, according to the latest revision of U.S. EPA SW-846 Method 8141. A five-point calibration curve will be used to calculate the results of analyses. The lowest point on the calibration curve should be equal to, or slightly higher than, the limit of detection of the GC-FPD system. The highest point on the calibration curve should be the end of the linear portion of the FPD response profile. All laboratories will follow the QA/QC criteria described in the analytical method. Those results will be stored at each laboratory for review at a later date, if necessary.

GC column: 30-meter X 0.53-mm ID DB-5 fused silica capillary column.

GC oven and injector conditions: As necessary for desired results.

Internal Standard: Chlorpyrifos

6.) CONFIRMATION OF ANALYSES

For qualitative and quantitative confirmation of the dioxathion results, all sample extracts will be analyzed by gas chromatography-mass spectrometry (GC-MS) using the latest revision of U.S. EPA SW-846 Method 8270, or an equivalent mass spectrometry system that is deemed appropriate to give equivalent results. A five-point calibration curve will be used to calculate the results of analyses. The lowest point on the calibration curve should be equal to, or slightly higher than, the limit of detection of the GC-MS system. The highest point on the calibration curve should be the end of the linear portion of the MS detector response profile. All laboratories will follow the QA/QC criteria described in the analytical method. Those results will be stored at each laboratory for review at a later date, if necessary.

GC column: 30-meter X 0.25-mm (or 0.32-mm) DB-5 fused silica capillary column, as specified in Paragraph 4.1.2 in U.S. EPA SW-846 Method 8270.

GC oven and injector conditions: As specified in Paragraph 7.3 in SW-846 Method 8270.

The specifications given in Method 8270, Section 4.0, "APPARATUS AND MATERIALS," and Section 5.0, "REAGENTS," will be followed. The guidance in Section 7.0, "PROCEDURE" will be used to perform the GC separations and GC/MS identification and quantitation. Specific criteria for peak identification are given in Section 7.6 of the method. The characteristic ions, both primary and secondary ions, listed in Table 1 of the method will be used. For dioxathion, the primary ion is m/z 97 with secondary ions at m/z 125, 270, and 153. Instrument tuning criteria are given in Table 3 of the method. For the Internal Standard, chrysene-d_{12} is recommended because it meets the retention time criteria set forth in Section 7.3.2.

7.) GENERAL COMMENTS

a.) All samples will be extracted and analyzed within the normal holding times for organophosphorus compounds.

b.) The dioxathion standard to be used by all laboratories will be supplied by the Mississippi State Chemical Laboratory.

c.) Water samples spiked with dioxathion will be prepared by the Mississippi State Department of Environmental Quality (MSDEQ) personnel and distributed to each laboratory for inclusion in this study.

d.) All results of analyses and all confirmatory results will be reported to MSDEQ, who will collate them and distribute the results to the participating laboratories.

e.) A meeting will be held to review the results of analyses and to decide the next step in the implementation of the analytical methods to be used in monitoring well water samples from the Hercules Incorporated Hattiesburg plant.

f.) After its approval of this sampling and analysis protocol, MSDEQ will determine the time frame for the completion of all sampling and analysis activities and will set the date and time of the review meeting.

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
James I. Palmer, Jr., Executive Director

February 3, 1999

Mr. Charles S. Jordan
Environmental Coordinator
Hercules, Inc.
P.O. Box 1937
Hattiesburg, Mississippi 39401

Re: Hercules, Inc
Sampling and Analysis Protocol for Dioxathion

Dear Mr. Jordan:

The Mississippi Department of Environmental Quality (MDEQ) has reviewed the Draft Sampling and Analysis Protocol for the Determination of Dioxathion in Water dated January 22, 1999. The MDEQ has also reviewed Dr. Larry Lane's e-mail comment letter to Frank Carlin dated January 21, 1999. The MDEQ has the following comments concerning these documents:

1. The Sampling and Analysis Protocol does not include the sampling and analysis procedure to be followed when sampling for soils. In the December 3, 1998, meeting, Hercules, Inc., agreed to provide a standardized sampling protocol for both groundwater **and** soils.

2. There is a difference of opinion between Hercules, Inc., and the Mississippi State University (MSU) Chemistry Laboratory regarding the use of SW 846 Method 8270C for confirmation of Dioxathion. The MDEQ requires that the primary analytical method be an "EPA approved" method (in this case Method 8141A). However, the MDEQ will not require that the confirmation analysis be an EPA approved method. The MSU Chemistry Laboratory will conduct the confirmation analysis for MDEQ's samples with the analytical procedural method stated in Dr. Lanes e-mail. Hercules, Inc., may use Method 8270C or any other method for confirmation samples that will provide consistent and reliable results.

If you should have any questions or comments, you may contact Brian Young at (601) 961-5069.

Sincerely,

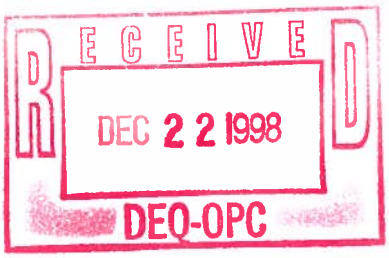
Tony Russell, Chief
Uncontrolled Sites Section

cc: Timothy D. Hassett/Hercules, Inc.
Dr. Larry Lane/MSU Chemistry Lab

A:\Hercules Analytical Method Comments.wpd

Hercules Incorporated
Hercules Plaza
1313 North Market Street
Wilmington, DE 19894-0001
(302) 594-5000
http://www.herc.com

December 21, 1998



VIA FAX AND OVERNIGHT MAIL

Mr. Brian Young
Project Manager
Office of Pollution Control
Mississippi Department of Environmental Quality
101 West Capitol Street
Jackson, MS 39289-0385

RE: **Hercules Hattiesburg Plant**

Dear Mr. Young:

Hercules appreciated Mississippi Department of Environmental Quality (MDEQ) providing the opportunity to meet with it's technical support group to discuss Hercules concerns regarding the analysis of dioxathion in environmental media. The meeting was conducted in Jackson, Ms. and attended by the following people: MDEQ -Tony Russell, Brian Young, Mississippi State University - Dr. Larry Lane, Ruble Coward, Hercules Incorporated - Charles Jordan, Frank Carlin, Timothy Hassett, Ecosystems, Inc. -Caleb Dana. The following is a summary of the highlights of the meeting and our understanding of the agreements made.

Hercules reiterated its desire to obtain a consensus between the MDEQ and Hercules on the appropriate analytical method used to measure dioxathion in the environment. Subsequently, Hercules and MDEQ, reviewed a data table showing the differences the results of "split samples". Hercules and MDEQ agreed that the following variables are critical to obtaining comparable results; analytical standard, extraction method, sample cleanup procedure, instrument procedure, sampling method, and procedure for preparing split samples.

Hercules agreed to prepare a draft protocol addressing all these variables, which would then be sent to MDEQ and MSU for review and comment. Once a protocol was agreed to, split samples will be collected and sent to their respective laboratories for analysis and all parties will compare the data. MDEQ also agreed to prepare a spike sample to be included in the split sampling round. Hercules agreed to take the lead on preparing the protocol and will submit a final draft protocol to MDEQ by January 15, 1999. It was also agreed at a previous meeting held on 12/3/98, that Hercules would submit a site investigation workplan to MDEQ, focused on delineating the nature, extent and source of dioxathion by February 15, 1998.

Mr. Brian Young
Hattiesburg Lane
December 21, 1998

In the interest of efficiency, it was agreed that Hercules chemists would communicate directly with the chemists of MSU. Hercules and MSU also agreed that their respective mass spectrometry chemists would be available to communicate, if necessary.

We thank you again for this opportunity to develop the appropriate analytical methods. Please do not hesitate to contact me (302) 594-7656 or Charlie Jordan (601) -545-3360 if you have any questions or concerns.

Sincerely,

Timothy D. Hassett
Hercules Incorporated
Staff Environmental Engineer

TDH/ijc
Hburg1

cc: T. Russell - MDEQ
Dr. L. Lane - MSU
R. Coward - MSU
C. S. Jordan - Hercules Hattiesburg
W. D. Langhans - Hercules Hattiesburg
F. J. Carlin - Hercules Research Center
G. M. Trovei - Hercules, SH&E
B. J. Hough - Hercules, SH&E
C. Dana - Ecosystems

HERCULES
CHEMICAL SPECIALTIES

Hercules Incorporated
P.O. Box 1937
Hattiesburg, MS 39403-1937
(601) 545-3450
FAX (601) 584-3226

FAX COVER SHEET

TO: Brian Young DATE: 12/2/98

MDEQ

Jackson, MS FAX #:601-961-5300

FROM: Walt Langhans, Plt. Mgr. Direct Dial # 601-584-3220 SHEET 1 of 2

****

MESSAGE:

Brian,

Attached is our proposed agenda for tomorrow's meeting. Please review and let us know by return Fax, or phone call, if changes are needed.

We are looking forward to meeting with you.

Thank you,

Walt Langhans, Plant Manager

End of Cover Sheet

584-3226

MDEQ - HERCULES INCORPORATED MEETING
DECEMBER 3, 1998 10 A.M. JACKSON, MS

PROPOSED AGENDA

- **INTRODUCTIONS/ PURPOSE OF MEETING/ DRAFT ORDER - HERCULES**

- **DELNAV® & DIOXATHION - HERCULES**
  - → Chemistry & Toxicology
  - → Hattiesburg Operations & Site Status
  - → Groundwater Sample Data

- **CONCERNS REGARDING DIOXATHION - MDEQ**
  - → Drivers for action
  - → Objectives
  - → Next Steps - All

- **CONCERNS REGARDING ANY OTHER CONTAMINANTS/ ISSUES - MDEQ**
  - → Drivers for action
  - → Objectives
  - → Next Steps - All

- **MEETING RECAP/ ADJOURN - ALL**
  - → Summarize agreements, action items & schedules

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY

James I. Palmer, Jr., Executive Director

MEMORANDUM

TO: Hercules, Inc., USS File

FROM: Brian Young/Project Officer

DATE: December 4, 1998

SUBJECT: Meeting of December 3, 1998

The purpose of this Memo is to document the discussions of the meeting held between MDEQ and Hercules, Inc. The purpose of the meeting was to discuss the recent analytical findings indicating that Dioxathion was present at the site, and also to discuss the Draft Administrative Order that MDEQ had sent to Hercules, Inc. General discussion centered on the need to standardize the analytical method used to sample the soils and groundwater for Dioxathion. It was decided to have a meeting the week of December 14, 1998, with chemists from Hercules, Inc., Mississippi State Chemistry Laboratory, and the MDEQ. This meeting will determine the methodology for sampling that will be followed. Hercules, Inc., proposed that in lieu of executing the Draft Administrative Order against them, that Hercules, Inc., should be allowed to proceed voluntarily with Remedial Investigation efforts. MDEQ agreed to this proposal with the understanding that if at some future time Hercules, Inc., failed to respond to MDEQ requests in a timely manner, MDEQ could issue the Administrative Order to Hercules, Inc., in order to achieve compliance. It was agreed in the meeting that by January 15, 1999, Hercules, Inc., will have determined the sampling protocol to be followed (with the input and agreement of MDEQ) in sampling for Dioxathion at the site. Furthermore, by February 15, 1999, Hercules, Inc., will submit to MDEQ a Remedial Investigation Plan for determining the horizontal and vertical extent of Dioxathion (and associated compounds) contamination at the Hattiesburg, Mississippi Site.

Attached are a Meeting Attendees List and Agenda.

OFFICE OF POLLUTION CONTROL
P.O. Box 10385 Jackson, MS 39289.0385 Phone 601.961.5171 Fax 601.354.6612

Department of Environmental Quality
Meeting Attendees List

Date: December 3, 1998

Company or Site: Hercules, Inc. Hattiesburg, MS

Location of Site: Capitol Centre Conference Room

Participant	Company or Organization	Phone Number
Tony Russell	MDEQ	601-961-5318
Brian Young	MDEQ	601-961-5069
CHARLES JORDAN	HERCULES INCORPORATED	601 584-3226
WALT CANGHANS	HERCULES INCORPORATED	601 584-3220
Gary Trovei	Hercules Incorporated	302-594-5560
TIMOTHY HASSOIT	HERCULES INCORPORATED	302 594-7656

MDEQ - HERCULES INCORPORATED MEETING
DECEMBER 3, 1998 10 A.M. JACKSON, MS

PROPOSED AGENDA

- **INTRODUCTIONS/ PURPOSE OF MEETING/ DRAFT ORDER - HERCULES**
- **DELNAV® & DIOXATHION - HERCULES**
  - → Chemistry & Toxicology
  - → Hattiesburg Operations & Site Status
  - → Groundwater Sample Data
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  - → Drivers for action
  - → Objectives
  - → Next Steps - **All**
- **CONCERNS REGARDING ANY OTHER CONTAMINANTS/ ISSUES - MDEQ**
  - → Drivers for action
  - → Objectives
  - → Next Steps - **All**
- **MEETING RECAP/ ADJOURN - ALL**
  - → Summarize agreements, action items & schedules

- Hercules built in 1920
- ±1970's → paper chemicals,
- still producing resins

HERCULES

November 13, 1998

Hercules Incorporated
613 West 7th Street
P.O. Box 1937
Hattiesburg, MS 39403-1937
(601) 545-3450
FAX: (601) 584-3226
http://www.herc.com

CERTIFIED MAIL - RETURN RECEIPT REQUESTED
No. P 443 543 569

Mr. Bryan Young
Office of Pollution Control
P. O. Box 10385
Jackson, MS 39289-0385

Dear Mr. Young:

In response to your draft Administrative Order, and per our phone conversation on November 6th, I am requesting a meeting to discuss the issues and concerns your department has with the Hercules Hattiesburg site which has prompted this draft Order.

Your expression on the phone that we have been difficult to work with is a disappointment to me. Hercules is a member of the Chemical Manufacturers' Association and is committed to CMA's Responsible Care® program at both corporate and local levels. As such, we see ourselves as a responsible member of the Hattiesburg community.

I am confident that by meeting we can demonstrate our intention to cooperate with your department, and subsequently develop a plan to address your concerns.

Per our conversation on November 12, this is to confirm we have a meeting scheduled for 10:00 a.m. on December 3rd in your office. I will be bring Charlie Jordan, Gay Trovei, and Tim Hassett with me. Gay and Tim are Environmental Specialists from our corporate office.

Very truly yours,
HERCULES INCORPORATED

Walter D. Langhans /of

Walter D. Langhans
Plant Manager

HERCULES

Hercules Incorporated
613 West 7th Street
P.O. Box 1937
Hattiesburg, MS 39403-1937
(601) 545-3450
Fax: (601) 584-3226

FAX COVER SHEET

MESSAGE TO: Brian Young (NAME) | 11-16-98 (DATE:)

MDEQ (FIRM NAME) | 901-5742 (FAX #)

(CITY) | (STATE)

FROM: Charles Jordan | **SHT. 1 OF** 2

MESSAGE:

DAM MODEL
11-6-98
2:30
N. FLYNT

BM START 164.974

TP5 174.126 Chiseled SQ in Conc. of Bld slab @ corn of EUROPA & Apollo AVE

TP7 SET Cotton Spinde IN EAST side of P.P. #114 EL 172.586

TP8 NAIL in Conc @ Monitor Well #6 EL. 171.267

TP10 NAIL in Conc @ Monitor Well 5 EL. 157.844

TP3 NAIL in Conc @ Monitor Well #3 EL 156.946

TP15 NAIL in Conc @ Monitor Well #2 EL 157.098

TP4 NAIL in Conc @ Monitor Well #4 EL-156.665

TP 22 Cotton Spindle in PP#347 @ S/E Brick Bld. EL 175.430

TP25 NAIL in Conc @ Monitor Well #1 EL 170.925