Agenda
Rohm and Haas Chemicals LLC-Cincinnati
RCRA 3013 Order - RCRA Docket No. R3013-5-00-001

Location: USEPA Region 5 77 W. Jackson Blvd. Chicago, IL 60604 **Tuesday:** July 26, 2005 **Time:** 10:00 AM Central Time **Call In #:** **(202) 275-0199** **Passcode:** **4887#**	**Participants:** • U.S. EPA • Rohm and Haas Company • Geomatrix Consultants, Inc. • Parsons • USGS • Ohio EPA • Booz Allen Hamilton

AGENDA TOPICS

• Introductions	All
• Meeting Objectives Overview	Mirtha Capiro USEPA Region V Carl Coker Rohm and Haas Company
• Facility Investigation Status Update	Mark Hemingway Geomatrix Consultants, Inc.
• Revised Baseline Risk Assessment – o Approach and Findings o Preliminary Comments	Karen Fields and Fan Wang-Cahill Parsons Jennifer Nystrom and Kathy Rogovin Booz Allen Hamilton
• Status Update on Combined Sewer System Project	Carl Coker Rohm and Haas Company
• Status Update on French Drain Evaluation	Carl Coker Rohm and Haas Company
• Open Discussion – Outstanding Issues, proposal and selection of final corrective Action Remedies.	All
• Meeting Wrap-Up	All

Meeting regarding
Rohm and Haas LLC Chemicals
July 26, 2005

Carl J. Coker	Rohm and Haas Co.	Remediation Project Mgr
MARK P. HEMINGWAY	GEOMATRIX	CONSULTANT
RONALD LANTZY	ROHM AND HAAS CO.	TECHNICAL FELLOW
Fan Way-Cahill	Parsons	Consultant
Karen Fields	Parsons	Consultant
Jennifer Nystrom	Booz Allen Hamilton	Consultant
Harold O'Connell	OEPA	Supervisor – phone
Kathy Rogovin	Booz Allen Hamilton	US EPA contractor – phone
Richard Kulthau	Booz Allen Hamilton	USEPA contractor – phone
Robert Darner	USGS	Technical support – phone
Mirtha Cairo	US EPA	Project Manager

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF

02 MAY 2005

DE-9J

VIA ELECTRONIC MAIL AND
CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Carl J. Coker
Rohm and Haas Company
Engineering Division
3100 State Road
Croydon, Pennsylvania 19021

Re: National RCRA Corrective Action Conference
Rohm and Haas Chemicals LLC
U.S. EPA ID No. OHD 000 724 138

Dear Mr. Coker:

Thank you for contributing some of the material for the poster presentation by Region 5 at the United States Environmental Protection Agency, National Resource Conservation and Recovery Act Corrective Action Conference. Enclosed is a copy of a reduced version of the poster for your records.

The poster appears to have captured what constitutes the data deliverable process for the Rohm and Haas Chemicals LLC facility. We look forward to continue working with you on the electronic data deliverable effort by building on this positive experience.

Please contact me with any questions at 312/ 886-7567 or at capiro.mirtha@epa.gov.

Sincerely yours,

Mirtha Cápiro
Enforcement and Compliance Assurance Branch
Waste, Pesticides and Toxics Division

cc: Harold O'Connell, OEPA

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF

04 MAR 2005

DE-9J

VIA ELECTRONIC MAIL AND
CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Carl J. Coker
Rohm and Haas Company
Engineering Division
3100 State Road
Croydon, Pennsylvania 19021

Re: Modification of Request for Additional Work
Rohm and Haas Chemicals LLC (Former Morton International, Inc.)
U.S. EPA ID No. OHD 000 724 138

Dear Mr. Coker:

Thank you for your recent telephone and electronic mail communications as a mean of conferring with the United States Environmental Protection Agency (U.S. EPA) on the January 25, 2005, Request for Additional Work for the Rohm and Haas Chemicals LLC (Rohm & Haas) facility. We note that you initiated the above conferring within fifteen (15) days after your receipt of the U.S. EPA's request in accordance with paragraph 60 of the Administrative Order. As I indicated during the conferring, U.S. EPA has decided to modify the request to allow use of information and data available from the United States Geological Survey (USGS) to avoid duplication of effort.

U.S. EPA hereby modifies the Request for Additional Work as follows:

> Rohm and Haas is not required to submit a proposal for addressing the information and data needs identified in the Request for Additional Work regarding the evaluation of aquifer test results and direction of flow in the Deep Upper Aquifer Sands for the Rohm & Haas facility. This is because supplemental information and data pertinent to the above subjects are expected to be available from USGS during the course of the year 2005.
>
> Upon availability from USGS, information and data pertinent to the evaluation of aquifer test results and direction of flow in the Deep Upper Aquifer Sands will become incorporated into the September

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2004, Revised Facility Investigation Report for the Rohm & Haas facility.

We agree with you that it would be helpful to plan a meeting, preferably at the facility. We would like to suggest that this meeting be planned for a time not earlier than mid April, so that we could complete appropriate arrangements for USGS representatives to participate. Also, as previously mentioned, U.S. EPA is conferring with the Ohio Environmental Protection Agency as to the applicability of any state standards or associated permitting requirements which may be relevant to this project. The future meeting may provide an opportunity to discuss any necessary future steps for the project based on the agency's discussions.

To discuss meeting plans or if you have any questions regarding this letter, please contact me at 312/ 886-7567 or at capiro.mirtha@epa.gov.

Sincerely yours,

Mirtha Capiro
Enforcement and Compliance Assurance Branch
Waste, Pesticides and Toxics Division

cc: Harold O'Connell, OEPA
Thomas C. Nash, C-14J
Mark Hemingway, Geomatrix

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF

25 JAN 2005

DE-9J

VIA ELECTRONIC MAIL AND
CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Carl J. Coker
Rohm and Haas Company
Engineering Division
3100 State Road
Croydon, Pennsylvania 19021

Re: Revised Facility Investigation Report and Request for Additional Work
Rohm and Haas Chemicals LLC (Former Morton International, Inc.)
U.S. EPA ID No. OHD 000 724 138

Dear Mr. Coker:

The United States Environmental Protection Agency (U.S. EPA) has completed review of the Revised Facility Investigation Report for the Morton International Inc. (Morton) facility, dated September 2004. The revised report was submitted by Geomatrix Consultants, Inc. on behalf of Morton. It is our knowledge that as of January 1, 2005, the Morton facility is owned and operated by Rohm and Haas Chemicals LLC (Rohm and Haas) per a December 17, 2004, letter from Jennifer Berke Levin, Senior Counsel for Rohm and Haas. U.S. EPA is issuing a conditional approval of the Revised Facility Investigation Report and a Request for Additional Work to the Rohm and Haas facility as detailed below.

U.S. EPA hereby approves the Revised Facility Investigation Report with the following conditions:

1. Section 5.4 Summary of Baseline Risk Assessment Findings. The Human Health and Ecological Risk Assessment shall be consistent with Morton's February 21, 2003, Responses to the U.S. EPA comments on the June 2002 Facility Investigation Report and the U.S. EPA's March 20, 2003, letter regarding the Facility Investigation and Additional Work.

2. Section 5.4 Summary of Baseline Risk Assessment Findings. The Safe Drinking Water Act Maximum Contaminant Level (MCL) for arsenic is 10 micrograms per kilogram. The Human Health Risk Assessment shall include the appropriate MCL value for arsenic.

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3. Section 6.1 Goal 2 The presence, location and character of human and ecological receptors. The Human Health and Ecological Risk Assessment shall address risk to ecological receptors associated with flora and fauna in Mill Creek and the Morton facility.

4. Section 7.0 Conclusions. In addition to ensuring that current human exposures are under control, the RCRA Corrective Action program's overall mission to protect human health and the environment requires that final remedies address potential future human exposure scenarios, future land and groundwater uses, and ecological receptors.

5. Per the U.S. EPA's February 6, 2004, letter of conditional approval of the Supplemental Facility Investigation Work Plan, "U.S. EPA may require additional wells for groundwater monitoring as part of final corrective measures. For example, additional monitoring locations may be necessary to ensure appropriate identification and mitigation of sources associated with the combined sewer system (CSS). U.S. EPA considers that it would be more efficient to identify any additional monitoring needs based on information generated from the planned replacement of the CSS."

6. Section 5.1.1 Upper Aquifer. Some aspects presented in this section appear to be inconsistent with information found elsewhere in the report (refer to items below).

   a) The text from page 59, paragraph 1, of this section, indicates that the Shallow Upper Aquifer (UA) Sand is absent in the northeastern corner of the Morton facility. This observation, which appears to be supported by boring log information, is consistent with Figure 5-9, Cross Section G-G'. However, Figure 5-1, Groundwater Gradient Map, provides a more limited extent of the Shallow UA Sand.
   b) The text from page 60, first paragraph, indicates that UAW09-20, UAW13-20 and UAW17-20 were the three Shallow UA wells selected for monitoring of water levels during the termination and restart of the Pristine pumping system. The reference to UAW17-20 should probably be UAW17-40 based the text from paragraph 3 of same page.

7. Some of the findings presented in Section 5.0 Findings of Investigation can be viewed as contradictory or as lacking clarity (refer to items below). Based on the data presented in the report, U.S. EPA concludes that there is connection between the Upper and Lower Aquifers. U.S. EPA has no information to refute statement(s) that groundwater contamination from the facility has not migrated into the lower aquifer. U.S. EPA will require confirmation of site conditions through monitoring requirements as part of remedy.

   a) On page 62 there is a statement that the Deep UA Sand near UAW15-50 (in "central area of the site") is in communication with the Lower Aquifer (LA) according to analysis of water levels recorded during the termination and restart of the Pristine pumping system.
   b) The text from page 77 indicates that "There is no indication of any direct connection between the UAW15-50 sand and the Lower Aquifer".
   c) On page 66, there is a statement that the impacts in the Deep UA sands in the vicinity of UAW15-50 are localized and LA groundwater is not impacted by the

Morton facility.

d) Cross section F-F' (Figure 5-8) shows a connection between the Deep UA Sands and the LA at UAW26-70. Based on Figure 5-1, UAW26-70 is approximately located 335 feet downgradient (in the Deep UA Sands) from UAW15-50.

e) The water-level data (as shown in Appendix C) does indicate the presence of communication between the Deep UA sands and the LA.

f) There is no specific discussion presented regarding the connection between the Deep UA sands and the LA near UAW26-70. This connection appears to allow pumping in the lower aquifer to effect water levels near UAW15-50. In addition, there is no discussion presented on whether this connection would allow contaminants to migrate to the LA.

8. Appendix C. A discrepancy appears in this section as described below.

a) According to page 62, paragraph 2, water levels were monitored in UAW21-60 from the Deep UA Sands. However, Appendix C shows UAW21-80. This discrepancy needs to be addressed.

U.S. EPA hereby issues a Request for Additional Work pursuant to paragraph 60 of the AO. The basis for the additional work and its scope is as follows:

Supplement to Appendix C. To show that the Shallow UA Sands are affected by surficial recharge and normal changes in water levels, the stage of Mill Creek, precipitation, and barometric pressure needs to be shown in Appendix C along with water level traces from wells UAW09-20, UAW13-20, and UAW17-40. Mill Creek water levels are available for the United States Geological Survey (USGS) surface-water station "Mill C @ Reading, Oh" (USGS gage number 03255500 on the Web at http://waterdata.usgs.gov/oh/nwis/uv/?site). Precipitation and barometric pressure data are available from the National Oceanic and Atmospheric Administration at http://nndc.noaa.gov/. Also, Appendix C needs to reflect the times associated with the shutdown and restart of the 150 gallons per minute (gpm) and 300 gpm pumping system from Pristine.

Direction of flow in the Deep UA Sands. Based on the Administrative Order (AO), Section VI. 57 (A), the Respondent is required to evaluate the regional and facility specific groundwater flow patterns. However, the number of wells included in the analysis from the Revised FI Report for determining direction of flow in the Deep UA Sands appears to be insufficient. Water level data from offsite wells shall also be used in determining the potentiometric surface to fully characterize the groundwater flow patterns for the area where the site is located.

Rhom and Haas is required to submit a proposal for addressing the above Request for Additional Work. Please note that the Request for Additional Work pertains to site hydrogeology information in support of monitoring requirements during the remedy process. Therefore, Rohm and Haas will be able to proceed with implementation of a risk assessment for preparing a Revised Human Health and Ecological Risk Assessment Report without further delay.

In addition, we would like to inform you that U.S. EPA may request additional information regarding prospective modifications to the French Drain system and projected estimates of loadings of constituents of concern entering Mill Creek. U.S. EPA is currently conferring with the Ohio Environmental Protection Agency as to the applicability of any state standards or associated permitting requirements which may be relevant to this project. If determined necessary, U.S. EPA will issue appropriate request(s) for information and notify you accordingly in regards to the mentioned aspects.

By June 30, 2005, Rohm and Haas shall submit a Revised Human Health and Ecological Risk Assessment Report. Please contact me to discuss a schedule for addressing the Request for Additional Work. Pursuant to paragraph 60 of the AO, Morton has the opportunity to meet or confer with U.S. EPA to discuss the Request for Additional Work within fifteen (15) days after the receipt of this letter.

If you have any questions regarding this letter, please contact me at 312/ 886-7567 or at capiro.mirtha@epa.gov.

Sincerely yours,

Mirtha Capiro
Enforcement and Compliance Assurance Branch
Waste, Pesticides and Toxics Division

cc: Harold O'Connell, OEPA
Thomas C. Nash, C-14J
Mark Hemingway, Geomatrix

5725 Highway 290 West,
Suite 200-B
Austin, Texas 78735
(512) 494-0333 • FAX (512) 494-0334

GEOMATRIX

Ms. Mirtha Capiro
Enforcement and Compliance Assurance Branch
Waste, Pesticides and Toxics Division
U.S. Environmental Protection Agency (USEPA)
Region 5 (DE-9F)
77 West Jackson Street
Chicago, Illinois 60604-3590

Subject: Submittal of Revised Facility Investigation (FI) Report
Morton International, Inc., Reading, Ohio
RCRA Docket No. R3010-5-00-001

Dear Ms. Capiro:

On behalf of the Rohm and Haas Co., Geomatrix Consultants, Inc. (Geomatrix) is submitting three copies of the Revised FI Report for your review. This document includes all data originally submitted in the original 2002 FI Report, as well as data acquired in the French drain pumping test, groundwater monitoring events, and the approved supplemental work that was performed this spring. This report is submitted to comply with Section 57 of the Administrative Order.

The supplemental field work (March and April 2004) was performed to address specific data gaps identified by the USEPA. All work specified in the Supplemental FI Work Plan was completed as planned, and no additional field activities are currently planned.

We look forward to discussing the findings of the total FI with you; our previous conversations on this work have been productive. Until that time, please contact Carl Coker at Rohm and Haas Co. (215/785-7193) or me with any questions.

Sincerely,
GEOMATRIX CONSULTANTS, INC.

Mark P. Hemingway, P.G.
Principal Hydrogeologist

cc: Bruce Beiser
Carl Coker
Eric Walker

Mirtha Capiro /R5/USEPA/US To
07/01/2004 04:11 PM Subject Morton International Inc.

Carl,

The United States Environmental Protection Agency approves the proposed schedule change for the Facility Investigation Report for Morton International Inc. (Morton) per your letter of June 21, 2004. Also, we consider that it would be appropriate for Morton to report any future additional findings using letter supplement(s).

Please contact me if you have any questions. Thanks.

Mirtha Cápiro
Environmental Scientist
U.S. Environmental Protection Agency
Region 5
77 W. Jackson Blvd. (DE-9J)
Chicago, IL 60604
312/ 886-7567
fax 312/ 353-4342
capiro.mirtha@epa.gov

100 INDEPENDENCE MALL WEST, PHILADELPHIA, PA 19106-2399 USA TELEPHONE (215) 592-3000

TO:
ENGINEERING DIVISION
3100 STATE ROAD
CROYDON, PA 19021
(215) 785-7000 FAX (215) 785-7458

ROHM AND HAAS

June 21, 2004

Ms. Mirtha Capiro
Project Coordinator
U.S. Environmental Protection Agency
Region 5
77 W. Jackson Boulevard, (DE-9J)
Chicago, Illinois 60604-3590

RE: Morton International, Inc.
2000 West Street, Reading, Hamilton County, Ohio
OHD 000 724 138

VIA: Facsimile and Certified Mail, Return Receipt Requested-
7002 2030 0002 0987 3131

As we discussed, this letter is submitted to provide you with a revised date for completion of the Revised Facility Investigation (FI) Report for the referenced property. You will recall that the schedule submitted in the Supplemental FI Work Plan (Geomatrix, December 2003) was described as an estimated timeline, and was based on expected durations of field work, analytical turnaround, and data validation. That estimated timeline projected submittal of the Revised FI Report on June 25, 2004, approximately 30 days after the anticipated completion of data validation.

Actual durations of field work and analytical turnaround have been longer than anticipated, and have extended the data acquisition portion of the Supplemental FI. The field work, for example, extended over two weeks longer than anticipated (April 8 vs. March 22). The last of the analytical reports were received from Severn Trent Laboratories on May 24, 2004, and data validation completion is currently anticipated by July 8, 2004. Allowing for 30 days to finalize the report after data validation is completed, we currently project submittal of the Supplemental FI Work Plan on approximately the week of August 9, 2004. In the event that there are any future changes to this schedule, we will be sure to update you.

Finally, if additional findings become available, we would propose to submit them in a letter supplement as opposed to reissuing the full report.

Please advise if this revised schedule and handling of supplemental information are acceptable. If you have any questions, please feel free to contact me at (215)785-7193 or Mark Hemingway at (512)494-0333.

Sincerely,

Carl J. Coker

Carl J. Coker
Remediation Project Manager
Rohm and Haas Company

CC: Jennifer Burke-Levin, Rohm and Haas
Mark Hemingway, Geomatrix

CINCINNATI DRUM SERVICE, INC.

RECONDITIONERS OF STEEL AND POLYETHYLENE CONTAINERS

P.O.BOX 16141
LUDLOW, KY 41016-0141

Chester Long
(1919-1979)

Phone 859-431-8335
Fax 859-261-0979

Oren Long
(1921-1997)

May 14, 2004

United States Environmental
Protection Agency
Region 5
77 West Jackson Blvd
Chicago, IL 60604-3590

ATTN: Mirtha Capiro

RE: Access to Property

Dear Ms. Capiro:

Cincinnati Drum Service, Inc. has no interest in promoting any investigation on any portion of our property unless a full release of any liability is granted by the USEPA.

We understand that the present study is in regard to Rohm & Haas clarifying their potential liability, but we are uncomfortable with any potential liability at Cincinnati Drum Service, Inc.

Are you able to alleviate this concern?

Regards,

CINCINNATI DRUM SERVICE, INC.

Jeffrey D. Long
President

JDL/cjs

Cc: Jeoffrey K. Long, President – Reading, OH Division

FAXED
MAY 14 2004
By_____

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF
DE-9J

MAY 13 2004

VIA OVERNIGHT MAIL

Jeffrey D. Long
President
Cincinnati Drum Service, Inc.
1 Louise Court
Ludlow, Kentucky 41016

Re: Access to property

Dear Mr. Long:

This is in response to your reply to a May 6, 2004 letter from the United States Environmental Protection Agency (U.S. EPA) requesting access to property owned and controlled by Cincinnati Drum Service, Inc. located at 400 Cavett Avenue, Cincinnati, Ohio. The U.S. EPA's request for access was on behalf of Rohm and Haas Company (Rohm & Haas) in connection with the field investigations for the Morton International Inc. (Morton) facility. We received your reply via a facsimile transmittal dated May 7, 2004. Your reply cited and included a copy of a letter you had previously sent to Rohm & Haas stating your belief that the data on record related to the Pristine Site should be sufficient.

U.S. EPA disagrees with your belief that the data on record should be sufficient to characterize conditions in Mill Creek upstream of the Morton facility based on the following:

- A November 1982 Hydrogeologic Report of the Pristine-Cincinnati Drum-Carstab Site in Reading, Ohio (the Morton site was formerly Carstab) contains the analytical results from surface water sampling conducted in Mill Creek at property owned and controlled by Cincinnati Drum Service, Inc. The report was prepared by Ecology and Environment Inc. on behalf of U.S. EPA. The report describes the surface water sampling locations at the subject property as follows: a) S03 location described as "25' U.S. Cinn. Drum northern fence", b) S04 location described as "Under north Cinn. Drum bridge", c) S05 location described as "Cinn. Drum-Carstab fence line", and d) S08 location described as "Under north Cinn. Drum bridge". Surface water samples were also collected at the following locations from Mill Creek outside of the subject property: a) S01 location described as "Under railroad bridge"; b) S02 location described as "Drainage ditch, at culvert, approx. 1000' west of Mill Creek"; and c) S06 location "Southern Carstab fence line". According to the report, the analyses of surface water samples from Mill Creek indicate organic contamination at the Cincinnati

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Drum-Carstab property line. The report adds that the source of the contamination appears to be a dark liquid oozing from the east creek bank. The report conclusions include a recommendation for implementing a remedial action plan at Carstab to prevent contaminated groundwater seepage into Mill Creek.

- There is more recent evidence of seeps located on the bank of Mill Creek on property owned and controlled by Cincinnati Drum Service, Inc. These seeps can be observed in a photograph dated March 22, 2001(number R1P5) from a July 27, 2001 Field Oversight and Sampling Trip Report prepared by TechLaw Inc. on behalf of U.S. EPA.

- The analytical results from sediment sampling conducted by the Ohio Department of Environmental Management (OEPA) indicates that organic contaminants are present at detectable concentrations in sediment from the bank of Mill Creek at property owned and controlled by Cincinnati Drum Service, Inc. OEPA conducted the sampling at two locations from the bank of Mill Creek at the subject property on October 31, 2001. As demonstrated by the OEPA analytical results, upstream sampling on property owned and controlled by Cincinnati Drum Service, Inc. is necessary to fully characterize the nature and extent of contamination from the observed seeps.

Based on the above, we reiterate our request for access to property owned and controlled by Cincinnati Drum Service, Inc. to allow representatives from Rohm & Haas to obtain sediment and surface water samples from the banks and/or bed of Mill Creek at the subject property.

Please give us your response to this request by May 17, 2004. Please contact me to discuss any questions you may have with respect to this request for access by either phone at (312) 886-7567, by fax at (312) 353-4342 or by e-mail at "capiro.mirtha@epa.gov".

Thank you in advance for your cooperation.

Sincerely,

Mirtha Capiro
Project Coordinator/Manager
Enforcement and Compliance Assurance Branch

cc:

Thomas Nash, C-14J
Harold O'Connel, OEPA
Carl Coker, Rohm & Haas

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF
DE-9J

MAY 06 2004

VIA OVERNIGHT MAIL

Jeffrey D. Long
President
Cincinnati Drum Service, Inc.
1 Louise Court
Ludlow, Kentucky 41016

Re: Access to property

Dear Mr. Long:

The United States Environmental Protection Agency (U.S. EPA) seeks access to property owned and controlled by Cincinnati Drum Service, Inc. located at 400 Cavett Avenue, Cincinnati, Ohio, on behalf of Rohm and Haas Company (Rohm & Haas). The purpose for seeking access is to allow representatives from Rohm & Haas to obtain sediment and surface water samples from the banks and/or bed of Mill Creek at the subject property.

The representatives from Rohm & Haas will conduct this activity based on the requirements for conducting monitoring, testing, analysis and reporting by the Morton International, Inc. (Morton) facility pursuant to a 3013 Order from U.S. EPA. The Morton facility is located at 2000 West Street, Reading, Ohio. Based on the Order requirements, Morton is conducting an investigation of their facility, including Mill Creek.

In order to complete the requirements from the Order, it is necessary for Morton to characterize conditions in Mill Creek upstream of their facility by collecting sediment and surface water samples from upstream. The reach of Mill Creek directly upstream from Morton is located on property owned and controlled by Cincinnati Drum Service, Inc. Therefore, U.S. EPA requests access to your property on behalf of Rohm & Haas.

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Please give us your response to this request by May 10, 2004. Please contact me to discuss any questions you may have with respect to this request for access by either phone at (312) 886-7567, by fax at (312) 353-4342 or by e-mail at "capiro.mirtha@epa.gov".

Thank you in advance for your cooperation.

Sincerely,

Mirtha Capiro
Project Coordinator/Manager
Enforcement and Compliance Assurance Branch

cc:

Thomas Nash, C-14J
Harold O'Connel, OEPA
Carl Coker, Rohm & Haas

Mark Hemingway
<MHemingway@geomatrix.com>
03/10/04 11:53 AM

To: Mirtha Capiro/R5/USEPA/US@EPA
cc: Rlantzy@rohmhaas.com, Carl Coker <ccoker@rohmhaas.com>, Eric L Walker <ewalker@rohmhaas.com>
Subject: UAW27 Drilling, Reading Site

OHD 000 724 138

Hello, Mirtha--

Just to keep you informed regarding significant activities and findings, we started drilling as planned yesterday. Our first boring with the rotasonic rig was one of the deep Upper Aquifer sand wells, UAW27, southeast of Bldg 19 and relatively near the front gate. Drilling went well, but please be aware that we did not observe a sand or other transmissive unit at or near the target depth.

As shown on Figure 6 of the Supplemental FI Work Plan, the target total depth of UAW27 was approximately 83 ft, with a transmissive unit anticipated at 70 to 80 ft depth range. This was based on nearby hydrogeological information, as shown in that cross section. We observed a sand at ~45' depth, but this is clearly not the targeted deep Upper Aquifer sand. FYI, the Lower Aquifer is believed to be present at a depth of over 120' at this location. The UAW27 boring was advanced to a depth of 105' without identifying a deeper sand.

As specified in Section 4.1 of the Supplemental FI Work Plan, our approved course of action at this point was to seal the boring with no well installation. We have done so, and are proceeding to the other planned deep Upper Aquifer well locations. The information acquired at UAW27 is useful to us, in better understanding the site hydrogeology and potential for migration pathways to be present or absent.

I hope that this information is useful to you, and please feel free to contact Carl or me if you have any questions.

Sincerely,

Mark

MARK P. HEMINGWAY, P.G.
Principal Hydrogeologist

Geomatrix Consultants, Inc.
5725 Highway 290 West, Suite 200 B

Austin, Texas 78735

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fx (512)494-0334
email mhemingway@geomatrix.com

RECEIVED MAR 1 0 2004

CINCINNATI DRUM SERVICE, INC.

RECONDITIONERS OF STEEL AND POLYETHYLENE CONTAINERS

P.O.BOX 16141
LUDLOW, KY 41016-0141

Phone 859-431-8335
Fax 859-261-0979

Chester Long
(1919-1979)

Oren Long
(1921-1997)

March 8, 2004

Rohm & Haas Company
3100 State Rd
Croydon, PA 19020

ATTN: Mr. Carl Coker, Remediation Project Manager

RE: ACCESS AGREEMENT

Dear Carl:

At this time, Cincinnati Drum Service, Inc. does not see the need for further investigation of the ground water aquifer requiring access to our property. It is our belief that the available monitoring well data and Mill Creek data, on record, through the investigation and remediation of the Pristine Superfund site should be satisfactory.

Sincerely,

CINCINNATI DRUM SERVICE, INC.

Jeffrey D. Long
President

JDL/cjs

Cc Jeoffrey D. Long, President – Reading, OH Division

100 INDEPENDENCE MALL WEST, PHILADELPHIA, PA 19106-2399 USA TELEPHONE (215) 592-3000

/ TO:
INEERING DIVISION
D STATE ROAD
CROYDON, PA 19021
(215) 785-7000 FAX (215) 785-7458

ROHM AND HAAS

March 4, 2004

Mr. Jeffrey D. Long
Cincinnati Drum Service, Inc.
P.O. Box 16141
Ludlow, KY 41016-0141

RE: Morton International, Inc. - Cincinnati Plant
RCRA 3013 Order
VIA: Overnight Mail

Dear Mr. Long,

I am the new Corporate Remediation Project Manager at Rohm and Haas Company, assigned to the Morton International, Inc. Cincinnati plant RCRA 3013 Order ("Order') project. I understand that you have communicated in the past with my predecessor, Peter Palena concerning EPA's Order addressed to Morton and site access issues. The purpose of this letter is to request that you grant us permission to obtain samples from the bed and banks of Mill Creek at the Cincinnati Drum Service, Inc. facility located at 400 Cavett Avenue, Cincinnati, Ohio 45215.

In order to fully investigate environmental conditions as a result of historical operations at the Morton property pursuant to the Order, it is necessary to take upstream background samples from Mill Creek. We have prepared an enclosed proposed access agreement, which would provide Morton with your permission for such access to take samples. My company will provide you with indemnity in the event of any damage caused by the access, and will be happy to share with you the analytical results or samples and reimburse you for any reasonable expenses as a result of these activities. For your information, we are also enclosing EPA's letter dated February 6, 2004, requesting that we continue to pursue access to Mill Creek adjacent to Cincinnati Drum. We hope that you will find the access agreement acceptable. If it is acceptable, kindly date and execute the agreement where indicated, and return to me in the enclosed self-addressed envelope. We would greatly appreciate your returning the executed document to me by March 15, 2004. I will provide you with a fully executed copy of the agreement for your files.

We are pleased to discuss with you any questions or concerns. Our in-house counsel, Jennifer Berke Levin, at 215-592-6838, would be pleased to discuss with your attorney any questions as well. We greatly appreciate your cooperation and hope that we can satisfy any concerns you may have.

Thank you again for your cooperation.

Sincerely,

Carl J. Coker

Carl J. Coker
Remediation Project Manager
Rohm and Haas Company

Enclosures

cc: Eric Walker
Mark Hemingway, Geomatrix Consultants, Inc.
Jennifer Berke Levin, Esquire
Mirtha Capiro, USEPA

ACCESS AGREEMENT

THIS ACCESS AGREEMENT (the "Agreement") is made and entered into this _____ day of _____ 2004, by and between Jeffery D. Long, Trustee, under Agreement dated December 30, 1992 and Morton International, Inc. ("Morton").

WITNESSETH:

WHEREAS, Jeffrey D.Long, Trustee (herein, "Owner")is the Trustee for the owners of certain real property occupied by the Cincinnati Drum Services, Inc. located at 400 Cavett Avenue, Cincinnatti , Ohio 45215 (herein, "the Cincinnati Drum property"); and

WHEREAS, Morton operates a facility at 2000 West Street, Cincinnati, Ohio 45215-3431 adjacent to the Cincinnati Drum property in Cincinnati, Ohio, which is subject to an Administrative Order issued by the United States Environmental Protection Agency (EPA) pursuant to Section 3013 of the Resource Conservation and Recovery Act of 1976, as amended, captioned *In the Matter of Morton International, Inc.,* 2000 West Street, Reading, Ohio 45215-3431, RCRA Docket No. R3013-5-00-001("Order");

WHEREAS, in connection with such Order, EPA has requested that Morton seek site access to the Cincinnati Drum property. Specifically, as part of a work plan for supplemental Facility Investigation of Morton's property, approved by EPA, Morton is requesting access to the bed and banks of Mill Creek adjacent to the Cincinnati Drum property

WHEREAS, Owner does hereby agree to allow access to that portion of its property located at 400 Cavett Avenue, Cincinnati, Ohio 45215 as depicted on Exhibit A, for the sole purpose as set forth under the terms and conditions of this agreement herein:

AGREEMENT

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, Morton and Owner agree to the terms and conditions as set forth herein:

1. Access and Consent: Owner hereby grants Morton, its parent company, Rohm and Haas Company, and their respective representatives, contractors, and consultants the right to access the property in and on the area designated on Exhibit A, for the sole purpose of obtaining soil, sediment, and water samples, all at the sole cost and expense of Morton. Owner agrees that access will extend to other parts of the Cincinnati Drum

property for the sole purpose of gaining entry to the sampling areas. Morton further agrees to provide Owner with advance notification of sampling activities. Morton agrees that its representative, contractor, and consultant will cooperate with Owner in its oversight, if any, of the access and sampling, and Morton hereby agrees to pay to Owner any and all reasonable fees and costs which it may incur relating to this access agreement, following presentation of an invoice documenting such fees and costs; provided however, that any projected expenditure for fees and costs in excess of $500.00 must be preapproved by Morton.

2. Waste Removal: Morton shall be responsible for the removal and disposal of any and all waste generated from the sampling, at its sole expense.

3. Indemnification: Morton agrees to indemnify, defend, and hold harmless Owner and Cincinnati Drum, and its shareholders, directors, officers, employees, and consultants from any and all claims and damages arising out of the negligent or reckless conduct of Morton, Rohm and Haas, and their representatives, contractors, consultants in connection with the activities conducted pursuant to this access agreement. This indemnification obligation shall survive termination of this agreement for one year following the date of the last access. Owner and Cincinnati Drum will not be held responsible for any injuries to Morton or Rohm and Haas employees, contractors, or representatives while on Cincinnati Drum property.

4. Results of sampling: Upon Owner's request, Morton will provide promptly a copy of the sampling report and data. Additionally, upon Owner's request, Morton will provide it with duplicate or split samples.

5. Repair, Closure, and Restoration: Morton shall repair promptly any damage caused to the property by the sampling and access activities pursuant to this Agreement. Rohm and Haas will restore any portion of the Property adversely affected to substantially the same condition as of the date first above written, reasonable wear and tear excepted.

6. Termination: The parties hereto agree that this Agreement shall remain in full force and effect until the earlier of: (a) the expiration of a period of two (2) years, commencing from the date hereof; or (b) upon thirty (30) days after written notice of termination by Morton; or (c) upon thirty (30) days after the written notice of termination from Owner.

7. This agreement shall be construed in accordance with the laws of Ohio.

8. Notice: All notices, demands, requests, consents or approvals which may or are required to be given by either party to the other shall be in writing and shall be deemed given as of the date of receipt, Registered Mail, postage prepaid, or if by fax to the following:

Mr. Jeffrey D. Long, Trustee
President
Cincinnati Drum Service, Inc.
P.O. Box 16141
Ludlow, KY 41016-0141

Bruce Beiser
Plant Manager
Morton International, Inc.
2000 West Street
Cincinnati, OH 45215
Phone: 513-733-2179

with a copy to:

Carl J. Coker
Remediation Project Manager
Engineering Division
Rohm and Haas Company
3100 State Road
Croydon, PA 19021
Phone: 215-785-7193

Or such other address and representative as either party may later designate in writing.

9. Assignment: The rights granted hereunder may not be assigned by Morton without the prior written consent of Owner.

10. Entire Agreement: This Agreement constitutes the entire undertaking between the parties hereto, and supersedes any and all prior agreements, arrangements, and understandings between the parties with respect to the matters contained herein. Any change in the terms and conditions set forth herein shall be in writing and signed by duly authorized representatives of Morton and Owner.

11. Counterparts: This Agreement may be executed in two (2) or more counterparts, each of which shall constitute an original.

IN WITNESS WHEREOF, the authorized representatives of the parties hereto have executed and delivered this agreement effective as of the month, day and year first written above.

Jeffery D. Long, Trustee
Under Agreement Dated December 30, 1992

_____

Morton International, Inc.

_____ By: _____

EXHIBIT A

Description of Property Location

Exhibit A

PRIOR INSTRUMENT REFERENCES

Being the same undivided one-half interest conveyed to Oren Long and Jane Long, his wife, from INTERNATIONAL MINERALS AND CHEMICAL CORPORATION, a New York Corporation having its principal office at 5401 Old Orchard Road, Skokie, Illinois, by Deed dated November 17, 1970, recorded on November 20, 1970 in Deed Book 3761, Page 628, of the Recorder's Office of Hamilton County, Ohio.

IN WITNESS WHEREOF, Grantors have caused this instrument to be executed this 29 day of DECEMBER, 1992.

WITNESS:

OREN LONG, GRANTOR

JANE LONG, GRANTOR

COMMONWEALTH OF KENTUCKY)
COUNTY OF KENTON) SS:

Before me, a notary public in and for said county, personally appeared OREN LONG and JANE LONG, his wife, known to me to be the persons who executed the foregoing instrument, signed the same and acknowledged to me that they did so sign the instrument and that the same is their free act and deed.

In testimony whereof, I have hereunto subscribed my name and affixed my official seal at Erlanger, Kentucky this 29 day of DECEMBER, 1992.

NOTARY PUBLIC

My Commission Expires:
9/20/95

This Instrument Prepared By:

JOHN B. S. BROOKING
Attorney-at-Law
401 Garrard Street
P.O. Box 861
Covington, Kentucky 41012-0861
(606) 291-0270

Exhibit A

688786

9-H-94-D

WARRANTY DEED

HAMILTON COUNTY RECORDER'S OFFICE
Doc Type - EXDEED Type: GE
Filed:12/30/1992 12:53:25 PM 4 10.00
Off.Rec.: 6048 1022 F 2 670

OREN LONG and JANE LONG, his wife, Grantors, of Kenton County, Kentucky, for valuable consideration paid, GRANT AND CONVEY TO

JEFFREY D. LONG, Trustee, or his Successor in Trust, under Agreement dated December 30, 1992, with full power of sale, an undivided one-half interest in and to the property described below.

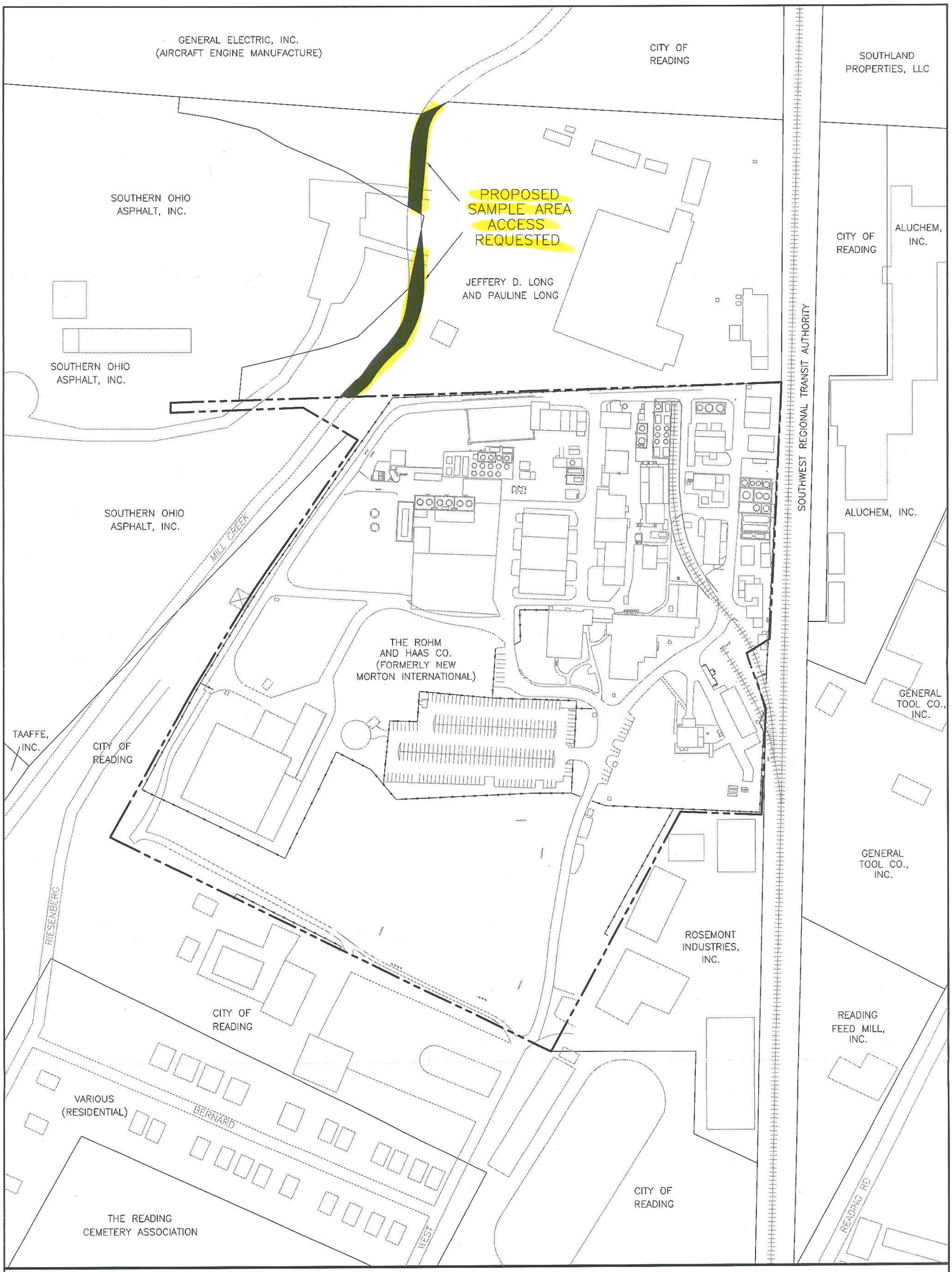
A parcel of land situated in Section 33, Town 4, Entire Range 1, Sycamore Township, City of Reading, County of Hamilton, State of Ohio, and being more particularly described as follows:

Starting at a steel post in the Northeast corner of said Section 33; thence Southwardly in the east line of said section a distance of 1749.38 feet to a point; thence North 86 degrees 20 minutes 47 seconds West, a distance of 784.50 feet to a concrete monument in a west Right-of-Way Line of the Phil. Balt. and Washington Railroad; and the Place of Beginning of the Tract of land herein described; thence South 0 degrees 09 minutes 23 seconds West, a distance of 450.00 feet to a point; thence South 85 degrees 08 minutes 15 seconds West, a distance of 200.00 feet to an iron pin; thence South 85 degrees 08 minutes 15 seconds West, a distance of 994.03 feet to a concrete monument; thence North 3 degrees 47 minutes 23 seconds East, a distance of 61.33 feet to a concrete monument; thence North 73 degrees 17 minutes 45 seconds East, a distance of 204.00 feet to an iron pin; thence North 53 degrees 13 minutes 45 seconds East, a distance of 70.00 feet to an iron pin; thence North 43 degrees 44 minutes 38 seconds East, a distance of 144.22 feet to an iron pin; thence North 8 degrees 51 minutes 45 seconds East, a distance of 158.11 feet to an iron pin; thence North 64 degrees 16 minutes 15 seconds West, a distance of 226.00 feet to a concrete monument; thence North 65 degrees 11 minutes 15 seconds West, a distance of 100.00 feet to an iron pin; thence North 70 degrees 48 minutes 39 seconds West, a distance of 100.06 feet to an iron pin; thence North 80 degrees 21 minutes 15 seconds West, a distance of 100.00 feet to an iron pin; thence North 86 degrees 47 minutes 48 seconds West, a distance of 55.10 feet to a concrete monument; thence North 37 degrees 45 minutes 45 seconds East, a distance of 34.75 feet to a point; thence South 86 degrees 14 minutes 15 seconds East, a distance of 551.74 feet to an iron pin in the center of the East Branch of Mill Creek; thence with the centerline of said creek North 47 degrees 53 minutes 45 seconds East, a distance of 197.55 feet to an iron pin; thence leaving the centerline of said creek South 86 degrees 20 minutes 47 seconds East, a distance of 665.17 feet to an iron pin in the West Right-of-Way line of the Stormsold Railroad; thence with the West line of said railroad South 0 degrees 09 minutes 23 seconds West, a distance of 400.82 feet to a concrete monument; thence South 86 degrees 47 minutes 20 seconds East 6.00 to the point of beginning. Containing 13.827 Acres of land more or less.

DUSTY RHODES
HAMILTON COUNTY, OHIO 1.50

6048 1022

Exhibit B



Base Map Source: American Process Design, Inc., Cincinnati, OH., Proj. No. 16151, 410, 6/4/98.

NOTE:
PROPERTY OWNERSHIP INFORMATION WAS COMPILED USING TAX MAPS AND INFORMATION AVAILABLE ON THE FOLLOWING INTERNET SITES: http://205.133.113.116/ (Hamilton County Auditor Home Page) and http://cagis.hamilton-co.org/map/cagis.htm (CAGIS Internet Map Server)

-N-

0 200

APPROXIMATE SCALE (FEET)

EXPLANATION

MORTON FACILITY PROPERTY BOUNDARY

ACCESS REQUEST AREA

PREPARED FOR

ROHM AND HAAS CO.
READING, OHIO

GEOMATRIX

Project No.
7168

7168P25.DWG

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

RECEIVED FEB 12 2004

REPLY TO THE ATTENTION OF:

FEB 06 2004

DE-9J

VIA FACSIMILE AND
CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Carl Coker
Rohm and Haas Company
Engineering Division
3100 State Road
Croydon, Pennsylvania 19021

Re: Supplemental Facility Investigation Work Plan
Morton International, Inc.
U.S. EPA ID No. 000 724 138

Dear Mr. Coker:

The United States Environmental Protection Agency (U.S. EPA) has completed review of the Supplemental Facility Investigation (FI) Work Plan for the Morton International Inc. (Morton) facility, dated December 2003. The supplemental work plan was submitted by Geomatrix Consultants, Inc. on behalf of Morton.

U.S. EPA hereby approves the Supplemental FI Work Plan based on the following conditions:

1. Section 4.0 Supplemental Groundwater Investigation

U.S. EPA may require additional wells for groundwater monitoring as part of corrective measures. For example, additional monitoring locations may be necessary to ensure appropriate identification and mitigation of sources associated with the combined sewer system (CSS). U.S. EPA considers that it would be more efficient to identify any additional monitoring needs based on information generated from the planned replacement of the CSS.

2. Section 4.0 Supplemental Groundwater Investigation

Boreholes for the installation of the proposed monitoring wells UAW 26, UAW27 and UAW28 shall be advanced and continuously sampled for lithology to a depth where the lower aquifer is

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encountered. Morton shall conduct this requirement to develop an improved understanding of subsurface stratigraphy, including any communication between the Deep Upper Aquifer Sand(s) and the Lower Aquifer. Prior to implementation of field activities, Morton shall have appropriate Standard Operating Procedures (SOP) in place for completing this activity in a manner that prevents cross contamination within the borehole.

3. Section 5.0 Mill Creek

U.S. EPA considers that the proposed sample location biased toward the north property boundary may be influenced by releases from the Morton facility and would not be representative of conditions to be found upstream of the Morton facility. U.S. EPA agrees that upstream sampling in Mill Creek at public stream crossings would not be representative of conditions immediately upstream of the Morton facility. As part of the Facility Investigation, Morton shall continue to pursue access to the streambed adjacent to the Cincinnati Drum Service Inc. facility which would be representative of conditions immediately upstream of the Morton facility. U.S. EPA will consider exploring possible means to assist Morton with obtaining access for this required upstream sampling.

Upon placement of any SOP modifications deemed necessary based on this conditional approval, Morton shall submit a copy to U.S. EPA for inclusion with the Supplemental FI Work Plan.

If you have any questions regarding this letter, please contact me at 312/886-7567.

Sincerely yours,

Mirtha Capiro
Enforcement and Compliance Assurance Branch
Waste, Pesticides and Toxics Division

cc: Harold O'Connell, OEPA
Thomas C. Nash, C-14J
Mark P. Hemingway, Geomatrix Consultants

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

MAR 02 2004

REPLY TO THE ATTENTION OF:

DE-9J

VIA FACSIMILE AND
CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Carl Coker
Rohm and Haas Company
Engineering Division
3100 State Road
Croydon, Pennsylvania 19021

Re: Addendum 01, Supplemental Facility Investigation Work Plan
Morton International, Inc.
U.S. EPA ID No. OHD 000 724 138

Dear Mr. Coker:

The United States Environmental Protection Agency (U.S. EPA) has completed review of the Supplemental Facility Investigation Work Plan, Addendum 01, for the Morton International Inc. (Morton) facility, dated February 24, 2004. The work plan addendum was submitted by Geomatrix Consultants, Inc. on behalf of Morton.

U.S. EPA hereby approves the work plan addendum. Morton shall process the data collected during the supplemental investigations in accordance with the approved Data Management Plan, including information from the stratigraphic boring STR12.

If you have any questions regarding this letter, please contact me at 312/886-7567.

Sincerely yours,

Mirtha Capiro
Project Coordinator/Manager
Enforcement and Compliance Assurance Branch
Waste, Pesticides and Toxics Division

Recycled/Recyclable • Printed with Vegetable Oil Based Inks on 50% Recycled Paper (20% Postconsumer)

cc: Harold O'Connell, OEPA
Thomas C. Nash, C-14J
Mark P. Hemingway, Geomatrix Consultants

Mark Hemingway
<MHemingway@geomatrix.com>

02/13/04 12:50 PM

To: Mirtha Capiro/R5/USEPA/US@EPA
cc:
Subject: RE: Follow up to voice mail on Morton facility

Mirtha--
I have received your voice mail, and I believe I understand your direction. We will place the boring within the boundaries of a quadrilateral formed by the locations of UAW15-50, UAW16-10, STR05, and UAW11-10. Given access and traffic, I believe this will place us on the west side of the 20/21/22 building. You are further requesting that we place the boring as close to this building as access will reasonably allow.

Please let me know if I have mis-stated your thoughts on this. Otherwise, I will proceed as we have discussed.

Thanks again,

Mark

-----Original Message-----
From: Capiro.Mirtha@epamail.epa.gov [mailto:Capiro.Mirtha@epamail.epa.gov]
Sent: Friday, February 13, 2004 12:01 PM
To: Mark Hemingway
Subject: Follow up to voice mail on Morton facility

Mark- Please refer to my voice mail with further clarification on the conditional approval for the Supplemental FI Work Plan for the Morton facility. Though, when we spoke earlier I suggested considering UAW18 as spatial reference for locating a stratigraphic boring. Per my voice mail, I am no longer suggesting that UAW18 be used as spatial reference, so I thought I would clarify that point.

Please refer to my voice mail message for further details. Please let me know if you have questions. Thanks.

Mirtha Cápiro
Environmental Scientist
U.S. Environmental Protection Agency
Region 5
77 W. Jackson Blvd. (DE-9J)
Chicago, IL 60604
312/ 886-7567
fax 312/ 353-4342
capiro.mirtha@epa.gov

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:

FEB 06 2004

DE-9J

VIA FACSIMILE AND
CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Carl Coker
Rohm and Haas Company
Engineering Division
3100 State Road
Croydon, Pennsylvania 19021

Re: Supplemental Facility Investigation Work Plan
Morton International, Inc.
U.S. EPA ID No. 000 724 138

Dear Mr. Coker:

The United States Environmental Protection Agency (U.S. EPA) has completed review of the Supplemental Facility Investigation (FI) Work Plan for the Morton International Inc. (Morton) facility, dated December 2003. The supplemental work plan was submitted by Geomatrix Consultants, Inc. on behalf of Morton.

U.S. EPA hereby approves the Supplemental FI Work Plan based on the following conditions:

1. Section 4.0 Supplemental Groundwater Investigation

U.S. EPA may require additional wells for groundwater monitoring as part of corrective measures. For example, additional monitoring locations may be necessary to ensure appropriate identification and mitigation of sources associated with the combined sewer system (CSS). U.S. EPA considers that it would be more efficient to identify any additional monitoring needs based on information generated from the planned replacement of the CSS.

2. Section 4.0 Supplemental Groundwater Investigation

Boreholes for the installation of the proposed monitoring wells UAW 26, UAW27 and UAW28 shall be advanced and continuously sampled for lithology to a depth where the lower aquifer is

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U.S. EPA considers that the proposed sample location biased toward the north property boundary may be influenced by releases from the Morton facility and would not be representative of conditions to be found upstream of the Morton facility. U.S. EPA agrees that upstream sampling in Mill Creek at public stream crossings would not be representative of conditions immediately upstream of the Morton facility. As part of the Facility Investigation, Morton shall continue to pursue access to the streambed adjacent to the Cincinnati Drum Service Inc. facility which would be representative of conditions immediately upstream of the Morton facility. U.S. EPA will consider exploring possible means to assist Morton with obtaining access for this required upstream sampling.

Upon placement of any SOP modifications deemed necessary based on this conditional approval, Morton shall submit a copy to U.S. EPA for inclusion with the Supplemental FI Work Plan.

If you have any questions regarding this letter, please contact me at 312/886-7567.

Sincerely yours,

Mirtha Capiro
Enforcement and Compliance Assurance Branch
Waste, Pesticides and Toxics Division

cc: Harold O'Connell, OEPA
Thomas C. Nash, C-14J
Mark P. Hemingway, Geomatrix Consultants

Jennifer.Telford@ch2m.com

12/15/03 01:10 PM

To: Mirtha Capiro/R5/USEPA/US@EPA
cc: finnegan_brendan@bah.com, PCichy@rohmhaas.com, PPalena@rohmhaas.com, Joel.Wipf@ch2m.com, luck_kevin@bah.com
Subject: Request for New Valid Values - Morton International, Inc., Reading, Ohio site

The following new valid values are requested in advance of an upcoming data submission for the Morton Internation, Inc., Reading, Ohio site. These values are required by the pertinent EDDs to be submitted. In case of difficulty in receiving the tables embedded below, the attached Word document contains the same requested valid values.

Please respond to this request as soon as possible, preferrably no later than Thursday, December 18, 2003.

EPAR5TRSQC EDD

Field

New Valid Value

prep_method

SW3520C

lab_qualifiers

*

lab_qualifiers

*D

lab_qualifiers

BJ

lab_qualifiers

BJE

lab_qualifiers

JB

lab_qualifiers

JE

lab_name_code

STL-CANT

EPAR5CFM EDD

Field

New Valid Value

param_unit

uS/cm

Thank you.

Jen Telford

CH2M HILL

703-471-6405 x4336

NewValidValueRequest_20031215.d

```
Count  358: Error: Ref value in data is not valid (Ref type is
prep_mthd_var) [Lab_Prep_Method_Name = 'SW3520C']
Count   17: Error: Ref value in data is not valid (Ref type is
qualifier) [Lab_Qualifiers = '*']
Count  114: Error: Ref value in data is not valid (Ref type is
qualifier) [Lab_Qualifiers = '*D']
Count   53: Error: Ref value in data is not valid (Ref type is
qualifier) [Lab_Qualifiers = 'BJ']
Count    1: Error: Ref value in data is not valid (Ref type is
qualifier) [Lab_Qualifiers = 'BJE']
Count   17: Error: Ref value in data is not valid (Ref type is
qualifier) [Lab_Qualifiers = 'JB']
Count    1: Error: Ref value in data is not valid (Ref type is
qualifier) [Lab_Qualifiers = 'JE']
Count 3353: Error: Ref value in data is not valid (Ref type is
subcontractor) [Lab_Name_Code = 'STL-CANT']
Count  126: Warning: Single Quote in record may cause errors [*Row
Warning* = 'NULL']
```

100 INDEPENDENCE MALL WEST, PHILADELPHIA, PA 19106-2399 USA TELEPHONE (215) 592-3000
CABLE ADDRESS: ROHMHAAS CENTRAL FAX (215) 592-3377

REPLY TO:
ENGINEERING DIVISION
X 584
BRISTOL, PA 19007
(215) 785-7000 FAX (215) 785-7458

ROHM AND HAAS

6 November 2003

Ms. Mirtha Capiro
Enforcement and Compliance Assurance Branch
Waste, Pesticides and Toxics Division
U.S. Environmental Protection Agency
Region 5 (DE-9F)
77 West Jackson Street
Chicago, Illinois 60604-3590

Re: Morton International, Inc.
Reading, Ohio Facility
RCRA Docket No. R3013-5-00-001

The following is the schedule discussed during our October 28th, 2003 meeting for conducting the activities is response to the USEPA, Region 5's comments to the Supplemental Facility Investigation (SFI) Work Plan. In that meeting, you indicated that the USEPA could provide a rapid review of the revised SFI Work Plan, given the apparent resolution of most of the outstanding technical issues regarding the scope of the investigation work. As noted below, this schedule is based in part upon an assumption of timely review.

	Tasks	Completion Date
1.	Groundwater Monitoring Well Sampling	Week of Nov 10th, 2003
2.	Response to USEPA comments on the SFI Work Plan	November 12th, 2003
3.	Submit revised SFI Work Plan	December 5th, 2003
4.	Mobilization for SFI field activities	March 1st, 2004[1]

Thank you for your cooperation during this project. We look forward to continuing to work with you in a timely and efficient manner in addressing the issues at the facility. If you have any questions, please do not hesitate to contact me at (215) 785-7079.

Sincerely,

Peter V. Palena Jr.
Rohm and Haas Company
Corporate Remediation Manager

---

1 Assumes approval of SFI Workplan by February 1st, 2004. If the SFI Workplan is approved later than February 1st, 2004, then field activities will commence within 30 days of the approval.

Mirtha Capiro

11/19/03 04:50 PM

To: Mark Hemingway <MHemingway@geomatrix.com>
cc: Anne Haikola <ahaikola@geomatrix.com>, Peter V Palena <PPalena@rohmhaas.com>, Ronald J Lantzy <RLantzy@rohmhaas.com>
Subject: Re: Revised memo re dioxin/furan sampling in Mill Creek.

Mark,

U.S. EPA agrees with the rationale presented in you memo (below) for excluding dioxin/furans from the list of parameters for sampling in Mill Creek as part of the supplemental investigations for Morton International, Inc.

Please consider the above in your revisions to the May 2003 Supplemental Facility Investigation Work Plan per the proposed schedule. It is suggested that a copy of the memo may be included with the revised work plan. Alternatively, the text from the work plan may include the rationale you presented.

Thanks.

Mirtha Cápiro
Environmental Scientist
U.S. Environmental Protection Agency
Region 5
77 W. Jackson Blvd. (DE-9J)
Chicago, IL 60604
312/ 886-7567
fax 312/ 353-4342
capiro.mirtha@epa.gov
Mark Hemingway <MHemingway@geomatrix.com>

Mark Hemingway <MHemingway@geomatrix.com>

11/18/03 06:16 AM

To: Mirtha Capiro/R5/USEPA/US@EPA, Peter V Palena <PPalena@rohmhaas.com>, Ronald J Lantzy <RLantzy@rohmhaas.com>
cc: Anne Haikola <ahaikola@geomatrix.com>
Subject: Revised memo re dioxin/furan sampling in Mill Creek.

Mirtha--

Peter Palena requested I send you this email as a follow up to our discussion on Oct 28 regarding analytical parameters for the Mill Creek sediment and surface water samples.

In our analysis of FI soil and groundwater samples for the App IX TAL, we analyzed 41 soil and 15 groundwater samples, plus a number of blanks, for the dioxins/furans sublist detailed in our QAPP (Table A1-2). This sublist consists of three polychlorinated dibenzofurans and four polychlorinated dioxins. There were

no detections, even qualified detections, of any of the seven analytes on the dioxins/furans sublist. The samples analyzed included both on-site and off-site (background) locations.

In summary, there is no indication that these compounds exist either on-property or in nearby off-property areas. If biologic degradation or another process was occurring that could generate these compounds from PCBs or other observed chemical species, we would also expect to see some detection in soils or groundwater. The complete absence of these compounds in any sample indicates that they were not released, nor are they being generated in situ from other processes.

As we discussed on Tuesday, the dioxin/furan sublist is an expensive analysis. Given the absence of any trace of these compounds in either on-site soil and groundwater samples or off-site soil samples, we believe it is reasonable to delete these seven compounds from the proposed Mill Creek evaluation work under the Supplemental FI activities. This request would apply both the surface water and creek bed sediment samples.

Please note that our App IX-TAL SVOC list does include the compound dibenzofuran (the non-chlorinated species). Our planned surface water and sediment analysis will include this compound.

I appreciate your consideration of this matter, and encourage you to contact Peter Palena or me if you have any questions.

Sincerely,

MARK P. HEMINGWAY, P.G.
Principal Hydrogeologist

Geomatrix Consultants, Inc.
5725 Highway 290 West, Suite 200 B
Austin, Texas 78735

ph (512)494-0333
fx (512)494-0334
email mhemingway@geomatrix.com

Mark Hemingway
<MHemingway@geomatrix.com>

11/18/03 06:16 AM

To: Mirtha Capiro/R5/USEPA/US@EPA, Peter V Palena <PPalena@rohmhaas.com>, Ronald J Lantzy <RLantzy@rohmhaas.com>
cc: Anne Haikola <ahaikola@geomatrix.com>
Subject: Revised memo re dioxin/furan sampling in Mill Creek.

Mirtha--

Peter Palena requested I send you this email as a follow up to our discussion on Oct 28 regarding analytical parameters for the Mill Creek sediment and surface water samples.

In our analysis of FI soil and groundwater samples for the App IX TAL, we analyzed 41 soil and 15 groundwater samples, plus a number of blanks, for the dioxins/furans sublist detailed in our QAPP (Table A1-2). This sublist consists of three polychlorinated dibenzofurans and four polychlorinated dioxins. There were no detections, even qualified detections, of any of the seven analytes on the dioxins/furans sublist. The samples analyzed included both on-site and off-site (background) locations.

In summary, there is no indication that these compounds exist either on-property or in nearby off-property areas. If biologic degradation or another process was occurring that could generate these compounds from PCBs or other observed chemical species, we would also expect to see some detection in soils or groundwater. The complete absence of these compounds in any sample indicates that they were not released, nor are they being generated in situ from other processes.

As we discussed on Tuesday, the dioxin/furan sublist is an expensive analysis. Given the absence of any trace of these compounds in either on-site soil and groundwater samples or off-site soil samples, we believe it is reasonable to delete these seven compounds from the proposed Mill Creek evaluation work under the Supplemental FI activities. This request would apply both the surface water and creek bed sediment samples.

Please note that our App IX-TAL SVOC list does include the compound dibenzofuran (the non-chlorinated species). Our planned surface water and sediment analysis will include this compound.

I appreciate your consideration of this matter, and encourage you to contact Peter

Palena or me if you have any questions.

Sincerely,

MARK P. HEMINGWAY, P.G.
Principal Hydrogeologist

Geomatrix Consultants, Inc.
5725 Highway 290 West, Suite 200 B
Austin, Texas 78735

ph (512)494-0333
fx (512)494-0334
email mhemingway@geomatrix.com

Draft Agenda
Morton International Inc.
Reading, Ohio Facility

November 14, 2003
1:00 pm Central Time
Meeting - Conference Call
Dial In: 1 (877) 250-3156, Passcode: 6785415

Attendees:

Mirtha Capiro, USEPA Region 5
Bhooma Sundar, USEPA Region 5
Peter Palena, Rohm and Haas Company
Ron Lantzy, Rohm and Haas Company
Mark Hemingway, Geomatrix

----- Agenda Topics -----		
Introduction to Participants	All	
Objective of Call	Mirtha Capiro	To provide orientation on status and major findings of Facility Investigation to date to new USEPA participants in the human health and ecological risk assessments, and to discuss upcoming activities
Basic Setting	Mark P. Hemingway	▪ Area ▪ Plant Description ▪ Groundwater Resources ▪ Surface Water ▪ Existing Remediation Systems
Scope of Work Performed to Date	Mark P. Hemingway	▪ 32 Upper Aquifer Wells ▪ 3 Lower Aquifer Wells ▪ 11 Stratigraphic Borings to Lower Aquifer or Bedrock ▪ 38 On-Site DPT Borings ▪ 10 Off-Site DPT Borings ▪ Aquifer Testing ▪ Sewer Videocam Survey ▪ 2 Sediment Samples ▪ Trench Drain Pumping Test ▪ 2 Seep Samples

Scope of Work Performed to Date (cont'd)		▪ 7 Geophysical Surveys ▪ Ecological Surveys of Site and Mill Creek ▪ 8 Exploratory Trenches ▪ 148 Soil Samples ▪ 87 Groundwater Samples
Summary of Major Findings	Mark P. Hemingway	▪ Groundwater ▪ Soil ▪ Mill Creek
Primary Current Receptors (note: Risk assessment process to be completed after Facility Investigation has been approved by USEPA)	Peter V. Palena	▪ On-site Contract and Plant Workers ▪ Mill Creek – Recreation
Proposed Actions that will Affect Potential Exposures	Peter V. Palena	▪ T-1 Soil Removal ▪ French Drain Improvements ▪ Sewer Improvement
Current Schedule	Peter Palena	
Conclusions	All	

Proposed Agenda
Morton-Cincinnati Facility Investigation
RCRA 3013 Order - RCRA Docket No. R3013-5-00-001

Location	Morton International Cincinnati Facility Building 18, Conference Room B
Tuesday	October 28, 2003
Time	8:30 AM

I. Introductions

II. Meeting Objectives
- Site Orientation/Reconnaissance for USEPA and their representatives
- Discussion of recent USEPA comments on Supplemental FI Work Plan and French Drain Pumping Test Report
- Clarification of selected comments by USEPA.

III. Safety Indoctrination[1]

IV. Overview of Site Walk

V. Site Walk
- UAW-15 Area
- UAW-17 Area
- Pristine/CDS Boundary Area
- Former Surface Impoundment Area
- French Drain
- Swale Area
- East Bank Mill Creek
- West Bank Mill Creek

VI. Discussion of USEPA Comments

VII. Project Schedule

VIII. Meeting Wrap-up

[1] PPE Requirements for site walk – Hard Hat, safety glasses, long pants, steel-toed shoes.

Morton International RCRA Attendees
October 28, 2003 Mtg

Name	Affiliation	Telephone
Peter Palena	Rohm and Haas Company	215-785-7079
MARK HEMINGWAY	GEOMATRIX	512-494-0333
ROB DARNER	USGS	614-430-7756
Tim Steiger	OHIO EPA	937-285-6089
Brian Mailot	USGS	614-430-7747
MIRTHA CAPIRO	US EPA	312/886-7567
Mace Barron	Booz Allen	3036849646
Jennifer Nystrom	Booz Allen	617-428-4453
Robin Cole	Rohm & Haas	513 7332132
BRUCE BEISER	Rohm & HAAS	513 733-2179

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

OCT 09 2003

REPLY TO THE ATTENTION OF:

DE-9J

VIA E-MAIL AND
CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Peter V. Palena
Corporate Remediation Manager
Rohm and Haas Company
P.O. Box 584
Route 413 and State Road
Bristol, Pennsylvania 19007

Re: Conditional Approval of Supplemental Facility Investigation Work Plan and Request for Additional Work
Morton International, Inc., U.S. EPA ID No. 000 724 138

Dear Mr. Palena:

The United States Environmental Protection Agency (U.S. EPA) has completed review of the Supplemental Facility Investigation (FI) Work Plan for the Morton International Inc. (Morton) facility, dated May 2003. The work plan was submitted by Geomatrix Consultants, Inc. on behalf of Morton pursuant to the requirements of the Administrative Order (AO), RCRA Docket No. R3013-5-00-001. U.S. EPA hereby conditionally approves the Supplemental FI Work Plan provided that Morton revises the May 2003 work plan in accordance with the U.S. EPA comments enclosed with this letter.

In addition to the above required revisions to the Supplemental FI Work Plan, U.S. EPA has determined that additional work is necessary pursuant to paragraph 60 of the AO. This request for additional work supersedes the requirements from U.S. EPA's November 25, 2002, request for additional work and February 18, 2003, letter of clarification regarding Mill Creek data gaps. Among other requirements, the U.S. EPA's previous request addressed the characterization of Mill Creek by means of sediment sampling and analysis using a parameter list to be designed based site-specific conditions (inclusion of those compounds that are present at detectable concentrations in groundwater or in seeps from Mill Creek bank and those compounds that have potential to bioaccumulate).

Additional work is necessary for conducting a characterization of Mill Creek by means of, in addition to sediment, surface water sampling and analysis using a comprehensive list of

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constituents regardless of site-specific conditions. As determined by U.S. EPA, surface water and sediment sampling and analysis for a comprehensive list of parameters is necessary to fully characterize exposure to receptors in Mill Creek. Moreover, this information shall be considered when assessing cumulative risk. Therefore, surface water and sediments from the bed of Mill Creek shall be characterized for a comprehensive list of parameters, including volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs) and metals from the Appendix IX-Target Analyte List used in the FI. Further, Morton should measure the total organic carbon content (TOC) of the sediment samples, which would be useful in assessing chemical bioavailability and toxicity in sediment. Based on the above, Morton shall conduct the following additional work:

- Conduct sampling of surface water at each location where sediment data are being collected per the Supplemental FI Work Plan.
- Conduct analysis of surface water and sediment using the Appendix IX-TAL.
- Conduct TOC analysis of sediment samples.
- The surface water and sediment data collected shall be utilized in the quantitative assessment of risks related to Mill Creek receptors as described in Section 5.0 of the Supplemental FI Work Plan.
- Morton shall include the above tasks in its revision of the Supplemental Facility Investigation Work Plan.

Please contact me within fifteen (15) days of receipt of this letter to agree on a time to discuss the schedule for submittal of the Morton's revised Supplemental Facility Investigation Work Plan with additional work tasks in accordance with this letter and enclosed comments. Also, further discussions are necessary regarding groundwater monitoring and identification of ecological receptors as discussed in the U.S. EPA comments. Pursuant to paragraph 60 of the AO, Morton has the opportunity to meet or confer with U.S. EPA to discuss the additional work within fifteen (15) days after the receipt of this letter.

To agree on a time for discussion or if you have any questions regarding this letter, please contact me at (312) 886-7567 or at "capiro.mirtha@epa.gov".

Sincerely,

Mirtha Capiro
Project Coordinator/Manager
Enforcement and Compliance Assurance Branch

Enclosure

cc w/ enclosure: Thomas C. Nash, C-14J
Harold O'Connell, OEPA
Mark Hemingway, Geomatrix Consultants, Inc.

COMMENTS FROM THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (U.S. EPA) ON THE MAY 2003 SUPPLEMENTAL FACILITY INVESTIGATION WORK PLAN MORTON INTERNATIONAL, INC. (Morton) READING, OHIO

The U.S. EPA'S review of the May 2003 Supplemental Facility Investigation (FI) Work Plan (Work Plan) for the Morton International, Inc. facility in Reading, Ohio indicates that the planned investigation adequately addresses most of the data gaps previously identified by U.S. EPA. However, the details of several elements of the proposed investigation require some revisions. These details are identified in the comments below, which are organized according to the respective section of the Work Plan. Also, further discussions are necessary regarding groundwater monitoring and identification of ecological receptors as discussed in the comments.

3.0 SUPPLEMENTAL SOIL INVESTIGATION

3.2 UAW17-40 Area

1. As part of the initial FI activities, two soil samples were collected from soil boring UAW17-40 at 1.5 feet and 5 feet below ground surface (ft bgs). Lead concentrations were reported at 28.4 milligrams per kilogram (mg/kg) and 128 mg/kg, respectively. To further delineate lead concentrations in this area, the Work Plan specifies the advancement of three additional soil borings adjacent to boring UAW17-40.

   These boring locations (illustrated on Figure 2 of the Work Plan) appear to be well placed to assess the lateral extent of lead contamination. However, the Work Plan does not adequately address the vertical extent of lead concentrations. Specifically, the Work Plan (page 6) states that "a single sample will be collected at a nominal depth of 5 ft bgs from each boring." This depth appears to be based on the depth at which the maximum concentration of lead was found during the FI. However, vertical sampling during the FI was limited, and the vertical distribution of lead is not well established. Consequently, additional vertical delineation is required to assess lead concentrations with depth using the soil sampling strategy for the FI per Section 5.2 of the FI Work Plan. The approved strategy includes continuous soil sampling to a depth of 15 feet (ft) below ground surface (bgs) or the water table, whichever is deeper. Morton shall provide appropriate revisions based on this comment.

3.4 Former Surface Impoundments

2. The Work Plan specifies direct push technique (DPT) borings to further characterize contaminant concentrations in soil in the area of the former surface impoundments. The Work Plan (page 7) states that "at each DPT location, soil will be continuously sampled for lithology to a total depth of approximately 15 feet." However, the soil sampling strategy for the FI per Section 5.2 of the FI Work Plan indicates that sampling will be continued to a depth of 15 feet bgs or the water table, whichever is deeper. Morton shall

provide appropriate revisions based on this comment.

3. The text from page 7 of the Work Plan specifies that 24 borings will be advanced in the surface impoundment area, from which 120 samples will be retained. Twelve of the 120 retained samples will be submitted for laboratory analysis. However, due to the importance of fully characterizing contaminant concentrations in this potential source area and the potentially complex distribution of contaminants due to the different affinities for adsorption of the various contaminants potentially released, analysis of 12 samples will not be sufficient to adequately characterize the lateral and vertical extent of soil contamination in this area. A greater density of analytical results is required. At least one sample from each of the 24 borings is to be sent to the laboratory for analysis. Additional samples from a specific boring should be sent if there are strong indications of impact in that boring.

4. When discussing the planned sampling program at the former surface impoundments, the Work Plan (page 7) quantifies the number of samples that will be sent to the laboratory for analysis. The soil sampling strategy for the FI per Section 5.2 of the FI Work Plan indicates that an analytical sample will be retained from the uppermost one (1) foot of soils if no evidence of impact is apparent in the field. For the purpose of sampling at the former surface impoundments, the soil sampling protocol shall be modified as follows:

> In the absence of field indications of impact, the samples sent for laboratory analyses will be selected from between the former bottom of the surface impoundment (five to six ft bgs according to the Current Conditions Report) and the total boring depth. In addition, in the absence of field indications of impact, the sampling depths should be varied from boring to boring to ensure a more complete delineation of contamination over the entire soil profile.

4.0 SUPPLEMENTAL GROUNDWATER INVESTIGATION

5. U.S. EPA considers that available site information raises various uncertainties with respect to the understanding of potential pathways of migration for groundwater contamination within the upper aquifer and between the upper and lower aquifers. Also, U.S. EPA's September 30, 2003, Documentation of Environmental Indicator (EI) Determination of Migration of Contaminated Groundwater Under Control further delineates monitoring requirements for the Morton facility. U.S. EPA would like to discuss the aspects related to these uncertainties and the EI determination at a meeting/conference call with Morton prior to reaching a decision on the scope of the supplemental groundwater investigation. Some aspects for discussion would be:

- The Draft FI Report suggests that contamination found at UAW15-50 may have migrated from a source area at the northwestern portion of the site. However, the

existing lithologic data do not show an apparent connection between the Shallow and Upper Sands in the upper aquifer.

- Although the Draft FI Report indicates that the primary component of flow in the Deep Upper Aquifer Sands is southward, it is noted that the reported groundwater elevations were higher at the southern end of the facility. This indicates some inconsistencies with respect to the reported information on groundwater flow. It is noted that the available hydraulic data from the Deep Upper Aquifer Sands are sparse. Hydraulic information from additional locations may be necessary for understanding flow directions in the Deep Upper Aquifer Sands.

- The approach for identifying areas of hydraulic communication between the Deep Upper Aquifer Sands and the lower aquifer does not appear to be sufficient to fully monitor groundwater migration pathways between the Deep Upper Aquifer Sands and the lower aquifer. Additional monitoring appears to be necessary at locations where there may be potential hydraulic communication between the Shallow Upper Aquifer Sands and the Deep Upper Aquifer Sands. Moreover, U.S. EPA's September 30, 2003, Documentation of Environmental Indicator (EI) Determination of Migration of Contaminated Groundwater Under Control acknowledges that the results from investigations conducted by Pristine at and downgradient from the Morton facility indicate that contamination in the lower aquifer is related to former operations at Pristine per a Superfund Record of Decision for the Pristine facility. The EI determination documents that the Pristine site is currently addressing the remediation of contamination from the lower aquifer. In addition, the EI delineates the requirement for the Morton facility to monitor the migration of groundwater contamination within the upper aquifer as well as between the lower and upper aquifers. Additional monitoring is needed at areas where communication between the Deep Upper Aquifer Sands and lower aquifer may exist to ensure that the conditions of Migration of Contaminated Groundwater Under Control remain in place. For example, the vicinity of UAW15-50 appears to be an appropriate monitoring location for implementation of this requirement.

5.0 MILL CREEK

6. U.S. EPA believes that it would not be appropriate to consider seep media as surface water and sediment for the purpose of risk screening/assessment for Mill Creek. Seeps do not represent creek conditions since creek bed media are likely to receive input from both seeps and groundwater inflow through the creek bed. In addition, seep areas may be more representative of soil conditions, rather than sediment areas. Seep data may be useful for understanding contaminant migration pathways associated with the site. It is noted that the prospects for collecting additional seep data under the Supplemental FI are uncertain due to the scarcity of seeps.

Refer to the U.S. EPA's request for additional work from cover letter for further requirements regarding the characterization of Mill Creek by means of sediment and surface water sampling and analysis.

7. General observations of sediment characteristics should be recorded and described (e.g., clay, silt, or gravel substrate) as documented in the June 2002 Draft FI Report. This information is important to facilitate interpretation of differences in contaminant levels between sampling areas (e.g., depositional areas vs. non-depositional areas).

8. Dissolved metal concentrations are most applicable for comparing surface water concentrations to water quality criteria, with unless shellfish or other filter feeders may be present in Mill Creek. Morton may use total metal concentrations to assess risks to aquatic organisms, or may collect sample and analyze for both total and dissolved metals. However, if dissolved metal data are not collected, dissolved metal concentrations should be assumed to equal total metal concentrations in screening for risks.

9. Upstream Characterization: The text from the work plan indicates that Rohm and Haas will contact property owners and request access for the purpose of conducting sampling in Mill Creek. For any questions on access to Mill Creek, please contact the United States Army Corp of Engineers.

4.0 PROJECT SCHEDULE AND REPORTING

10. Per U.S. EPA comment 5, the Agency suggests arranging a meeting or conference call to further discuss the groundwater monitoring and any other aspects from the supplemental investigations requiring clarification. Also, U.S. EPA representatives would like to conduct a site visit to facilitate discussions regarding the requirement for documentation of ecological receptors.

Appendix A Field Operating Procedures (FOPs)

Sediment Sampling From Creek/River Banks or Creek/River Beds

11. Protocols for sampling and analysis of sediments in Mill Creek are contained in a December 20, 2001 Evaluation of Mill Creek. However, Morton shall include the following protocol modifications as revisions to the Work Plan:

    - This section should be modified to indicate that sediment should be collected at a depth between zero and six inches consistent with a February 15, 2002, Scope and Schedule for Remaining Facility Investigation Field Work. U.S. EPA requests this modification because the top six inches of depth are the most relevant depth interval for assessing risks to ecological receptors. The Work Plan should also

note that depositional areas of the stream will be targeted.

- The procedure for sampling sediments states that the top few inches of sediment will be scraped off prior to collecting the sample. This section should note that a maximum of one inch of surface sediment should be removed and that sediment will be collected to a maximum depth of six inches. U.S. EPA requests this modification because the top six inches of depth are the most relevant depth interval for assessing risks to ecological receptors.

- Morton has not previously submitted Standard Operating Procedures for collection of sediment from stream bed, including use of the EnCore™ Sampling System per the FI Report. The revised Work Plan shall include appropriate SOP.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

OCT 09 2003

REPLY TO THE ATTENTION OF:

DE-9J

VIA E-MAIL AND
CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Peter V. Palena
Corporate Remediation Manager
Rohm and Haas Company
P.O. Box 584
Route 413 and State Road
Bristol, Pennsylvania 19007

Re: French Drain Pumping Test Results Report
Morton International, Inc., U.S. EPA ID No. 000 724 138

Dear Mr. Palena:

The United States Environmental Protection Agency (U.S. EPA) has reviewed and prepared comments on the January 14, 2003 French Drain Pumping Test Results Report for the Morton International Inc. (Morton) facility. The work plan was submitted by Geomatrix Consultants, Inc. on behalf of Morton pursuant to the U.S. EPA's November 25, 2002 Request for Additional Work under the requirements of the Administrative Order (AO), RCRA Docket No. R3013-5-00-001. The U.S. EPA comments are enclosed.

Morton shall revise and resubmit the French Drain Pumping Test Results Report based on the U.S. EPA comments. Please contact me to discuss and agree on a schedule for the required resubmittal.

To discuss a schedule and for any questions on this letter, please contact me at (312) 886-7567 or at "capiro.mirtha@epa.gov".

Sincerely,

Mirtha Capiro
Project Coordinator/Manager
Enforcement and Compliance Assurance Branch

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Enclosure

cc w/ enclosure: Thomas C. Nash, C-14J
Harold O'Connell, OEPA
Mark Hemingway, Geomatrix Consultants, Inc.

COMMENTS FROM THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (U.S. EPA) ON THE JANUARY 14, 2003, FRENCH DRAIN PUMPING TEST RESULTS REPORT MORTON INTERNATIONAL, INC. (Morton) READING, OHIO

The U.S. EPA's review of the French Drain Pumping Test Results Report (Report) indicates that the test results do not support the conclusion that the drain exerted hydraulic control in the Shallow Upper Aquifer (UA) Sand. An assessment of water level elevations at the conclusion of the test suggests that groundwater at the northern portion of the drain was not effectively controlled (see Comment 1). Additionally, based on the sustained pumping level achieved during the pumping test, it does not appear that the french drain is currently capable of capturing all of the groundwater in the affected portion of the Shallow UA Sand (see Comment 2). The provision of additional geologic data obtained during the installation of the piezometers used during the test may help understand the operating capabilities of the drain (see Comment 3).

Morton shall revise the Report based on the U.S. EPA comments to accurately document the degree of hydraulic control exerted by the French Drain in the Shallow Upper Aquifer (UA) Sand.

COMMENTS

1. The Report summarizes the results of the field investigation and on page 7 concludes that "the drawdown data from the pumping test suggests that the french drain may be capable of capturing the observed shallow dissolved-phase contamination along the Morton Facility's western boundary." Review of the test data indicates that groundwater levels along the drain generally responded to pumping. Drawdown varied from a maximum of seven feet at the south end of the drain at the sump to 0.2 feet in observation wells UAW07-20 and UAW08-20 at north end of the drain (refer to Figure 2 from the Report)

   Although drawdown along the length of the french drain indicates that groundwater levels responded to pumping, it does not, however, demonstrate hydraulic control along the drain. Proof of hydraulic control requires an assessment of water level elevations along both sides of the drain at the conclusion of the test and a determination that a flow reversals have occurred along the entire length of the drain. The data do not indicate that a reversal of gradient was obtained along the northern portion of the drain. This lack of hydraulic control suggests that the drain is not by itself an effective measure for controlling the westerly migration of contaminated groundwater toward Mill Creek.

   The report does not present an assessment of the gradients created across the french drain trench during the test. For example, information on water levels along a number of transects perpendicular to the trench, particularly along the northern portion of the trench, has not been presented. To help in analyzing the performance of the trench, all available geologic and water level data, as well as trench construction details, should be displayed on these transects.

2. As shown on Figure 5 of the report, the pumping rate during the test decreased from an initial 60 gpm to approximately 10 gpm, where the pumping rate stabilized. Based on these observations, the Report (page 7) concludes that "the long term discharge rate from the french drain is likely to be less than 10 gpm, although this rate may fluctuate with seasonal changes in groundwater flux through the Shallow UA Sand." However, according to the September 2002 French Drain Work Plan (page 9), "the withdrawal rate needed for the french drain to capture all groundwater in the affected part of the Shallow UA Sand has been estimated at approximately 60 gpm based on a calculated hydraulic conductivity (K), the measured hydraulic gradient and the cross section area of the Shallow UA Sand upgradient of the french drain." Based on these estimates, it does not appear possible to pump the drain at a sustained rate sufficient to capture the affected groundwater.

3. Eight piezometers were installed prior to the pumping test to provide field measurements of groundwater levels on both sides of the drain during the test. Water levels in 16 existing piezometers and monitoring wells were also measured during the test. However, the boring logs from the newly installed piezometers and the existing wells monitored during the test are not included in the Report.

4. The Report stated that a previously unknown extension of the french drain was discovered south of the sump that was pumped during the test. Morton should propose the procedures it will follow to attempt to assess the length and location of this segment and whether this segment could contribute to hydraulic control in areas south of the sump.

5. The extraction water analytical results presented in Table 3 of the Report are not compared against any regulatory standards.

Mirtha Capiro

10/06/03 11:37 AM

To: Peter_V_Palena@rohmhaas.com
cc:
cc:
Subject: Request for additional information on Voluntary Interim Measure Workplan for Morton International Inc. (Morton)

Peter,

USEPA does not plan to do a review decision on the above document because it is outside the scope of the order. However, we would like to provide some comments to you on whether the proposed voluntary approach may be consistent agency's corrective action guidance. For that purpose, we would like to have the following information:

- The section entitled "Soils Excavation" indicates that "the planned soil excavation will encompass an area of 30 feet by 10 feet and extend to a depth of 8 feet below ground surface...." Please provide the soil sampling results for locations DP39, DP40, DP41 and DP42 showing concentrations at a depth of 8 feet. Morton had previously indicated that this soil data set can be found in a CD that was submitted by Morton with the Facility Investigation Report. Unfortunately, we did not file the hard copy of the report together with the CD and are not able to locate it.

Thanks.

Mirtha Cápiro
Environmental Scientist
U.S. Environmental Protection Agency
Region 5
77 W. Jackson Blvd. (DE-9J)
Chicago, IL 60604
312/ 886-7567
fax 312/ 353-4342
capiro.mirtha@epa.gov

100 INDEPENDENCE MALL WEST, PHILADELPHIA, PA 19106-2399 USA TELEPHONE (215) 592-3000
CABLE ADDRESS: ROHMHAAS CENTRAL FAX (215) 592-3377

REPLY TO:
ENGINEERING DIVISION
[illegible]84
[illegible]OL, PA 19007
(215) 785-7000 FAX (215) 785-7458

ROHM AND HAAS

11 June 2003

Ms. Mirtha Capiro
Enforcement and Compliance Assurance
Branch Waste, Pesticides and Toxics Division
U.S. Environmental Protection Agency
Region 5 (DE-9F)
77 West Jackson Street
Chicago, Illinois 60604-3590

Via: Overnight Mail

Re: Voluntary Interim Measure Workplan
Morton International, Inc.
Reading, Ohio Facility
RCRA Docket No. R3013-5-00-001

This letter is to inform the United States Environmental Protection Agency (USEPA) Region 5 that Rohm and Haas Company plans to conduct an interim measure, excavation of soils in the T-1 area, at the Reading, Ohio facility (the Morton facility). For your review, please find enclosed two copies of the ***Interim Measures Work Plan Soil Excavation at Trench T-1*** prepared by Geomatrix Consultants (Geomatrix). This document provides the background information on the FI findings at the T-1 area, describes the anticipated field activities associated with this interim measure and the impact on the data to be used for the revised site risk assessments. Rohm and Haas proposes to perform this excavation as a voluntary interim measure, since it precedes the formal remedy implementation at the Morton Facility.

As a part of the Facility Investigation (FI) performed at the Morton Facility, Geomatrix identified a localized area of elevated metals apparently derived from two buried drums. The levels of several of the metals identified at this location, termed Trench T-1, are the highest detected at the Morton Facility. This excavation will reduce the potential for exposure to these metals by contractors or site workers . This interim measure will be implemented simultaneously with the Supplemental Investigation field investigation which is scheduled to be conducted this summer.

Please contact me if you have any questions or concerns.

Sincerely,

Peter V. Palena Jr.

Interim Measures Work Plan
Soil Excavation at Trench T-1
Morton International, Inc. Facility,
Reading, Ohio
RCRA Docket No. R3013-5-00-001

As a part of the Facility Investigation (FI) performed at the Morton International, Inc. Facility at Reading, Ohio (the Morton Facility), Geomatrix Consultants, Inc. (Geomatrix) identified a localized area of elevated metals apparently derived from two buried drums. The levels of several of the metals in samples from an excavation at this location, termed Trench T-1, are the highest detected at the Morton Facility. Figure 1 shows the location of Trench T-1 and the proposed soil excavation area.

The Rohm and Haas Company (Rohm and Haas) has directed Geomatrix to prepare a plan for excavation of the soils exhibiting elevated metals at the Trench T-1 area, in order to reduce the potential for exposure to these metals by contractors or site workers. Rohm and Haas proposes to perform this excavation as a voluntary interim measure, since it precedes the formal remedy implementation at the Morton Facility.

This Interim Measures Work Plan is intended to provide background information on the FI findings at the T-1 area, and describe the anticipated field activities associated with this interim measure. All excavation and sampling procedures will conform with the Project Health and Safety Plan, FI Work Plan, Data Management Plan (DMP), Quality Assurance Project Plan (QAPP) and applicable Field Operating Procedures (FOPs), including:

FOP Number	Title
B-6	Test Pit Excavation and Logging
G-1	Non-disposable and Non-dedicated Sampling Equipment Decontamination
G-2	Drilling and Excavation Equipment Decontamination
J-3	Management of Investigation-Derived Waste

The complete set of FOPs is found in the QAPP (Geomatrix, 2000). Appendix C of the Supplemental Work Plan (Geomatrix, 2003) should be consulted for sample location

nomenclature and details regarding changes to the Sample Labeling and Identification protocols.

Trench 1 Background Information

As described in the FI Report, geophysical surveys were conducted at a reported drum burial area termed Area F, near the fuel tanks south of Building 32, in the west central part of the Morton Facility. These geophysical surveys (surface electromagnetic methods) detected multiple metal anomalies. Subsequent trenching (Trench T-1) identified these anomalies as the remains of two metal drums, which were both removed and disposed of at a licensed off-site landfill. A halo of cemented soil surrounded one of the drums, possibly caused by the drum contents. Soils in the vicinity of these drums exhibited elevated levels of metals, particularly tin (158,000 milligrams per kilograms (mg/kg)), arsenic (580 mg/kg), chromium (232 mg/kg), and lead (19,300 mg/kg). On a site-wide basis, the samples from T-1 had the maximum measured concentrations for aluminum, arsenic, chromium, copper, lead, nickel, silver, thallium, and tin. Low levels of organics, including iodomethane, chloromethane, dibenzofuran, and pesticides were also observed. Subsequent DPT sampling of the area (DP39, DP40, DP41, and DP42), in addition to sampling in other nearby trenches (T-5 and T-8), indicates that elevated metals levels are confined to the immediate area of the former drum location.

Soils Excavation

Based on prior sampling in the vicinity of T-1, the planned soils excavation will encompass an area of 30 feet by 10 feet and extend to a depth of 8 feet below ground surface (bgs) (Figure 1). This is anticipated to remove all soils with metals concentrations that are anomalously high, relative to concentrations more typically observed in Morton Facility soils. The field team leader will direct excavation to encompass any additional observed areas of soil staining, unusual cementation, or other pertinent field indications. Excavation will **not** be conducted below the water table, approximately 12 feet below grade surface.

Excavation will proceed in accordance with safe work practices and the protocols summarized in the FOP – Test Pit Excavation and Logging. Entry of the excavation by field personnel is not anticipated, and is prohibited in any part of the excavation exceeding 4 feet in depth without proper sidewall stabilization. Although not anticipated to be required, engineering controls such as shoring, benching, or sloping should be employed as necessary to protect nearby structures.

The excavated soils will be directly loaded into lined roll-off boxes. If any soils are inadvertently placed on the outside of the box, these will be cleaned off, collected, and placed in the box before work is completed. Following sampling and waste characterization analysis, soils are anticipated to be disposed of at a licensed off-site disposal facility. The removal volume is estimated at approximately 90 cubic yards of in-place material, or approximately 120 cubic yards of excavated material. Pending disposal, the roll-off boxes will be tarped to prevent collection of rain water in the box and wind removal of soils from the box.

Additional wastes may include waters collected within the excavation either from rainfall or groundwater penetration. These waters will be pumped from the excavation into a holding tank pending disposal. With the approval of the Morton Facility and similar to the disposition of the investigation-derived wastewater, these waters may be transferred to the on-site waste water treatment facility.

Confirmation Soil Sampling

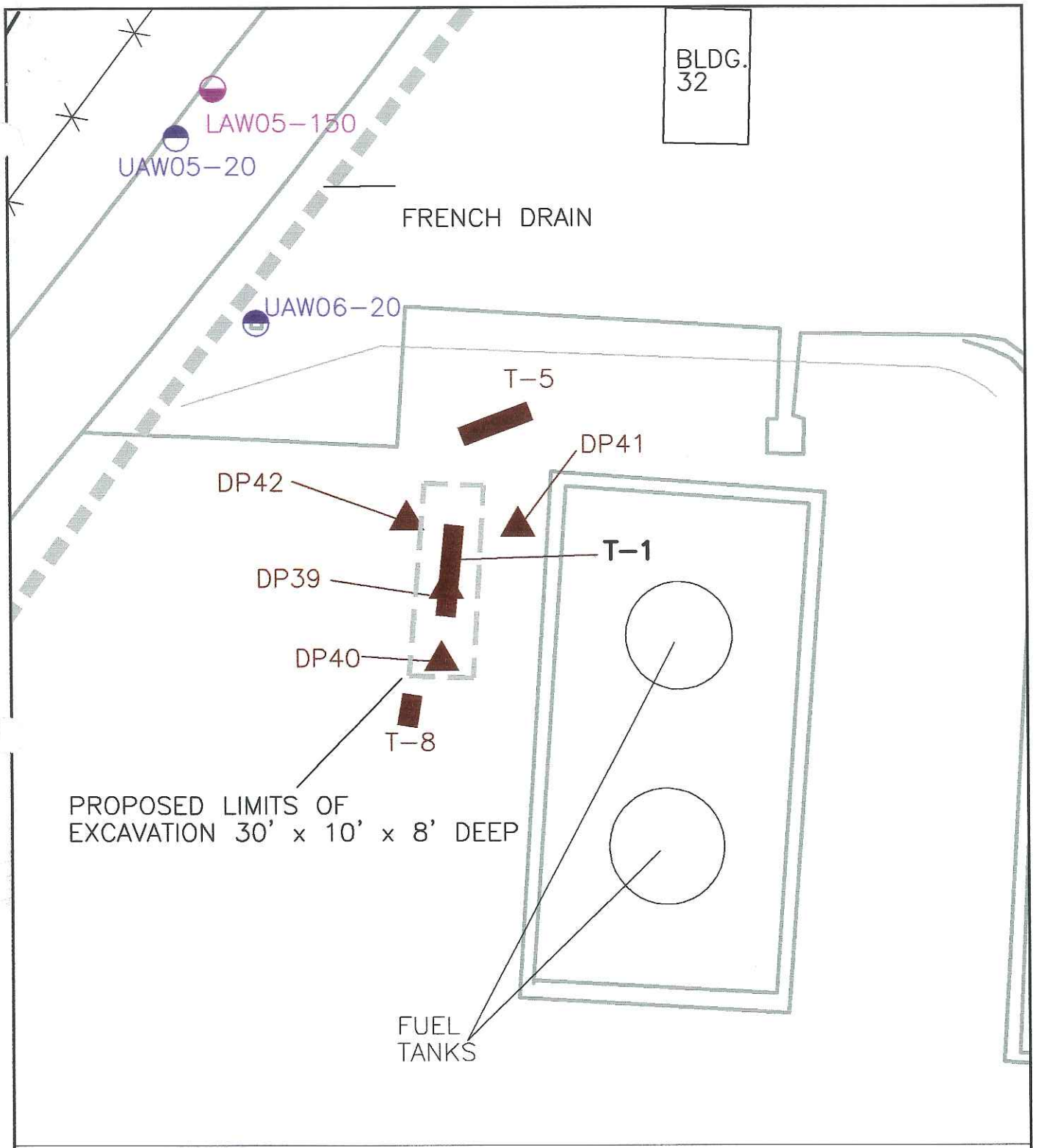
At the completion of the excavation, a single discrete sample will be collected from each sidewall and the base of the excavation, for a total of five confirmation samples. Sampling personnel will not enter the excavation for sampling. Confirmation samples will be collected remotely using the excavation equipment, and will be analyzed for lead, arsenic, tin, and chromium. Each confirmation sample will be collected from soil that has not come into direct contact with excavation equipment, and will be transferred to a stainless steel bowl for homogenization. The analytical results from the five confirmation samples will be used in future risk assessments and will replace the historical information from FI sampling at T-1. Specifically, the data from three FI samples, T-1-4', T-1-6', and DP-40-6', will be eliminated from the FI data set, and will be replaced with data generated from confirmation sampling.

Backfilling Excavation

The T-1 excavation will be backfilled with clean fill material using decontaminated equipment. Prior to being approved for use, a sample of off-site backfill will be collected and analyzed for the CLP- Target Analayte List plus tin and aniline (CLP-TAL – see the

Supplemental Investigation Work Plan for the complete analyte list). Chemical concentrations of backfill soils must be less than applicable risk screening levels.

Backfill shall be properly compacted, placed in lifts of no more that 12 inches in loose thickness. Following compaction of clean fill to grade, the area will be seeded with grass to return the area to pre-excavation conditions.



EXPLANATION

T-5	TRENCH LOCATION
UAW06-20	UPPER AQUIFER MONITORING WELL
LAW-05-150	LOWER AQUIFER MONITORING WELL
DP42	DIRECT PUSH SOIL BORING

N

0 20'

APPROXIMATE SCALE (FEET)

GEOMATRIX

PROPOSED SOIL EXCAVATION
AT TRENCH T-1
INTERIM MEASURES WORK PLAN
PREPARED FOR
MORTON INTERNATIONAL, READING OHIO

Project No. 7168

Figure No. 1

7168A03.DWG

Mirtha Capiro
04/30/03 10:53 AM

To: Peter_V_Palena cc: jwipf, MHemingway, luck_kevin
Subject: Data Management Plan (DMP) for Morton International, Inc.

Peter,

U.S. EPA has reviewed the Final DMP dated March 3, 2003, and has no further comments. Please submit any additional revisions that may be necessary with respect to the items discussed on your April 30, 2003, memorandum (see attached). Also, we suggest that any future field schedule changes being notified to U.S. EPA indicate schedule changes to the electronic data deliverable schedule. This logistical step may be described in the DMP for clarity.

I have discussed with Joel Wipf the above on the phone. However, please feel free to call me if you have further questions. Thanks.

MeetingQuestions_EPA.

Mirtha Capiro
03/28/03 07:02 PM

To: "Telford, Jennifer/WDC" <jtelfor1@CH2M.com>
Subject: Re: Final Data Management Plan - Morton International (Rohm & Haas) - Cincinnati, OH site

Below are the EPA comments on the Data Management Plan for Morton International, Inc (Morton). Please let me know if you have any questions.

Acronyms: It is strongly suggested that the DMP be revised to include a list of acronyms and terms.

Project Coordinator: The DMP needs to clarify the relationship between the data collection and management team and the project coordinator for Morton under the EPA order. Also, please note that the term "EPA RPM" should be replaced by EPA project coordinator for consistency with the EPA order.

The Rohm and Haas Corporate Remediation Group (CRG) website: Section 2.3 indicates that the DM is responsible for maintenance of the CRG website and that this website would contain EPAR5 data import templates. Further, Section 3.2 indicates that the CRG website should be checked prior to the preparation of any Work Plan or data collection activity to obtain an up-to-date set of EDD requirements. These DM responsibilities are also included as part of the project and event planning element from data flow in Table 1. It may be beneficial for the DMP to include a section/subsection summarizing the above mechanisms, roles and procedures relevant to the use and maintenance of the CRG website.

Section 2.1 Environmental Contractor Roles and Responsibilities: A parenthesis is missing from the first bullet on page 2-3. Please correct this minor editorial error.

Section 2.2 Laboratory Contractor Roles and Responsibilities: A parenthesis is missing from the first bullet on page 2-6. Please correct this minor editorial error.

Section 3.4 Sample Tracking: The last sentence from the last paragraph on page 3-8 has been left incomplete. Please correct this minor editorial error.

Deliverables and schedule:

What happens if there is a delay in the Environmental Contractor (EC) hard copy deliverables? Will it cause a delay in the Electronic Data Deliverable (EDD) deliverable schedule?

There are several mentions of EPA and/or Rohm and Haas setting data deliverables and submission schedules. Who sets these deliverables and schedules? Will they be set by Rohm and Haas and agreed upon by EPA or vice versa?

Changes/updates to EDD: Once the Data Management Contractor (DM) submits an EDD and EPA has reviewed it, it is likely that EPA may have changes/updates that would need to be made. The DMP should detail a plan to address any of these changes/updates.

Submissions/Agency review: On page 3-21 under "Methods of Shipment," all EPA Region 5 EDD submissions should be sent to EPA with attention to the EPA Project Coordinator. She/he will ensure that the submittal is passed along to Booz-Allen & Hamilton Inc. or applicable EPA contractor.

Section 3.5.3.5 Data Correction/Updates: On page 3-16 under section 3.5.3.5, the DMP describes a scenario in which files for the purpose of updating an EDD previously submitted to the DM may have several null fields. Please note that if any of these null fields are required and the files are

run through the Electronic Laboratory Data Checker (ELDC) (as described in this section), >Required field cannot be null= errors will appear. It may help if the DM informed the EC who would be running the ELDC of this fact. Assuming that all of the files from the previous file are correct, these null field error statements should be ignored. It may be beneficial for the DMP to describe these suggested steps under the above scenario.

Checking EDD before reporting: At several points, the DMP refers to using the "ELDC" -- which is one of the data checking software applications that data providers are supposed to use to check their EDD before submitting it to EPA. Instead of referring just to the "ELDC", the DMP should refer to the "ELDC and the Electronic Field Data Checker (EFDC)." The EFDC is the second data checking software application available on the EPA web site. EDDs should be checked using both the ELDC and the EFDC before submitting.

Each application checks specific EDD files are:

* The ELDC application checks for errors in the following five chemistry EDD files: CFM, SMP, TRS, TRSQC, and BAT.
* The EFDC application checks for errors in twelve EDD files (two chemistry files and ten "non-chemistry" files):
SITE, LOC, CFM, CWTR, GWTR, DRA, LTH, WEL, WSG, GSMP, TBL, and DHP.

Note: The CFM EDD file is the only file that can be checked using either the ELDC or the EFDC.

"Telford, Jennifer/WDC" <jtelfor1@CH2M.com>

"Telford, Jennifer/WDC" <jtelfor1@CH2M.com>

03/03/03 04:56 PM

To: Mirtha Capiro cc: PPalena, PCichy, "Wipf, Joel/CHI"
Subject: Final Data Management Plan - Morton International (Rohm & Haas) - Cincinnati, OH site

Mirtha, please find attached for your review the Data Management Plan (DMP) for the Morton International Facility in Reading, Ohio (also referred to as the Cincinnati, OH site).

If you have any questions regarding the information in the document, please feel free to contact Peter Palena/Rohm and Haas, or Joel Wipf/CH2M HILL.

Thank you.

Jen Telford
CH2M HILL
703-471-6405 x4336

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:

DE-9J

APR 02 2003

VIA E-MAIL AND
CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Peter V. Palena Jr.
Corporate Remediation Manager
Rohm and Haas Company
P.O. Box 584
Route 413 and State Road
Bristol, Pennsylvania 19007

Re: Data Management Plan
Morton International, Inc.
U.S. EPA ID No. 000 724 138

Dear Mr. Palena:

The United States Environmental Protection Agency (U.S. EPA) has reviewed and prepared comments on the Data Management Plan (DMP) for Morton International Inc. (Morton). The DMP was submitted by CH2MHILL on behalf of Morton pursuant to the requirements of the Administrative Order.

The U.S. EPA comments are limited to minor items as presented below.

Acronyms: It is strongly suggested that the DMP be revised to include a list of acronyms and terms.

Project Coordinator: The DMP needs to clarify the relationship between the data collection and management team and the project coordinator for Morton under the EPA order. Also, please note that the term "EPA RPM" should be replaced by EPA project coordinator for consistency with the EPA order.

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EPAR5 data import templates. Further, Section 3.2 indicates that the CRG website should be checked prior to the preparation of any Work Plan or data collection activity to obtain an up-to-date set of EDD requirements. These DM responsibilities are also included as part of the project and event planning element from data flow in Table 1. It may be beneficial for the DMP to include a section/subsection summarizing the above mechanisms, roles and procedures relevant to the use and maintenance of the CRG website.

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* The EFDC application checks for errors in twelve EDD files (two chemistry files and ten "non-chemistry" files):
SITE, LOC, CFM, CWTR, GWTR, DRA, LTH, WEL, WSG, GSMP, TBL, and DHP.

Note: The CFM EDD file is the only file that can be checked using either the ELDC or the EFDC.

Please submit a revised DMP addressing the U.S. EPA comments in accordance with the approved schedule.

If you have any questions regarding this letter, please contact me at (312) 886-7567 or at "capiro.mirtha@epa.gov".

Sincerely,

Mirtha Capiro
Project Coordinator/Manager
Enforcement and Compliance Assurance Branch

cc: Thomas C. Nash, C-14J
Mark Hemingway, Geomatrix Consultants, Inc.
Joel Wipf, CH2MHILL

100 INDEPENDENCE MALL WEST, PHILADELPHIA, PA 19106-2399 USA
TELEPHONE (215) 592-3000 CENTRAL FAX (215) 592-3377

REPLY TO:
ENGINEERING DIVISION
BOX 584
BRISTOL, PA 19007
(215) 785-7000 FAX (215) 785-7458

ROHM AND HAAS

7 March 2003

Ms. Mirtha Capiro
Enforcement and Compliance Assurance
Branch Waste, Pesticides and Toxics
Division
U.S. Environmental Protection Agency
Region 5 (DE-9F)
77 West Jackson Street
Chicago, Illinois 60604-3590

Re: Morton International, Inc.
Reading, Ohio Facility
RCRA Docket No. R3013-5-00-001

Via: Electronic mail and Overnight mail

For your review, please find enclosed three copies of the *Responses to the USEPA Additional Comments on the June 2002 Facility Investigation Report* prepared by Geomatrix Consultants for the above referenced project. This document provides responses to comments provided by USEPA to Morton on January 30th, 2003.

The primary focus of the additional USEPA comments was the potential for specific types of contaminants to have originated from Morton Facility releases and migrated to sediments in Mill Creek. Although each of the major issues raised in the additional comments will be addressed in more detail in the attached submission, one general concern raised in both these and previous USEPA comments is the need for further assessment of sediments and seep waters in and along Mill Creek to address the data requirements for the Human Health and Ecological Baseline Risk Assessments. Morton is willing to perform additional sampling of Mill Creek sediments and seeps, and to analyze these samples for a more expansive list of parameters than used during the original site investigation. The manner in which this data will be used , however, is of concern to Morton. Understanding that the data is required to complete the Baseline Risk Assessments and allow USEPA to understand the complete risks, it is Morton's position that we are responsible only for the releases from our facility. Morton has stated that Polychlorinated biphenyls (PCBs), polycyclic

aromatic hydrocarbons (PAHs), and pesticides in Mill Creek sediments are not derived from releases at the Morton Facility. It is Morton's expectation that if the data continues to support that these compounds are not derived from the facility, that they will be excluded from further assessment and remediation by the Risk Manager after the USEPA's review of the revised Facility Investigation Report and the revised Baseline Risk Assessments.

Morton has proposed, in the previous response to comments, to meet with USEPA representatives at the facility to discuss the responses, and to scope the field activities remaining to finalize the characterization of the site. Morton requests that USEPA propose an appropriate time for this meeting. Morton requests that the two parties meet as soon as possible to identify what additional data are needed to avoid delays to supplemental investigation work.

Thank you for your cooperation during this project. We look forward to continuing to work with you in a timely and efficient manner in addressing the issues at the facility. If you have any questions, please do not hesitate to contact me at (215) 785-7079.

Sincerely,

Peter V. Palena Jr.

Peter V. Palena Jr.
Rohm and Haas Company
Corporate Remediation Manager

Response To Additional
U.S. Environmental Protection Agency (USEPA) Comments
on the Facility Investigation Report

Morton International, Inc.
Reading, Ohio

On behalf of Morton International, Inc. (Morton), Geomatrix Consultants, Inc. (Geomatrix) has performed a Facility Investigation (FI) at the referenced site ("the Morton Facility"). This FI culminated in the submittal of an FI Report of findings in June 2002. The USEPA provided comments on the FI Report in November 2002. Morton responded to those comments on February 21, 2003. As Geomatrix was preparing the responses to these comments, USEPA provided Morton with an additional set of FI comments on January 30, 2003. Morton requested clarification on certain technical aspects of the additional comments on February 10, 2003, and the USEPA provided the requested clarifications on February 14, 2003. This document represents Geomatrix's evaluation of and response to the additional USEPA comments.

The four key issues presented in USEPA's additional comments are:

- Current or historical presence of Non-Aqueous Phase Liquid (NAPL)
- Matrix masking
- Historical dissolved-phase transport of organics
- Detection of compounds in seeps and sediments

Each of these issues is addressed in detail in this response. Morton/Geomatrix look forward to working with the USEPA to select sampling locations and analyte lists that will meet the requirements of the Administrative Order, and the objectives of the FI and Baseline Risk Assessment (BRA).

Response To Additional
U.S. Environmental Protection Agency (USEPA) Comments
on the Facility Investigation Report

Morton International, Inc.
Reading, Ohio

Issue 1 – Current or Historical Presence of Non-Aqueous Phase Liquid (NAPL)

Non-aqueous phase liquids, or NAPLs, is a term commonly applied to "Contaminants that remain undiluted as the original bulk liquid in the subsurface, e.g. spilled oil" (http://www.epa.gov/OCEPAterms/nterms.html). Although exceptions exist, NAPLs typically represent a hydrocarbon liquid, or oil phase.

Such a NAPL can exist in the subsurface in two basic phases—a mobile phase, often referred to as free product, and a residual phase. Residual NAPL remains in the subsurface media (soils, rock, or sediments) after mobile NAPL has moved through. This residual NAPL remains as microdroplets or films held in place by capillary or sorptive forces.

In their additional comment, the USEPA notes the presence of gray and black staining in many subsurface soil samples, particularly in the western portion of the facility. Geomatrix had discussed the presence of this staining in both the Current Conditions Report (Geomatrix, 2001) and the FI Report (Geomatrix, 2002). In the additional comment, USEPA expressed concern that this staining might represent a residual NAPL, which would indicate that a mobile NAPL had formerly traveled through the stained soils. If this were the case, USEPA noted the potential for this NAPL to have transported polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), pesticides, and other organics from the Morton Facility to Mill Creek.

Widespread staining to subsurface soils is present in the western portion of the facility. Although soil staining can be caused by the presence of NAPL, staining can also be caused by other factors, including biological activity, reduction of iron and manganese, etc. During the FI, Geomatrix specifically targeted stained soils for intensive sampling and analysis, retaining approximately 30 samples of stained soils for laboratory analysis. Geomatrix retained more samples than required in the approved FI Work Plan, based on the presence of this observed staining. The main purpose of this effort was to check for evidence of residual NAPL.

In response to the USEPA additional comment, Geomatrix has re-evaluated the descriptions and analytical data from the stained soils. Based on this re-evaluation, Geomatrix concludes that:

No residual NAPL is present in the stained soils.
Typically, the presence of residual NAPL contamination in soils is assessed by visual inspection and chemical analysis of samples from soil borings. Qualitatively, soil analyses that exhibit concentrations of organics in the percent range (i.e., greater than 10,000 mg/kg) would generally be considered to indicate the presence of residual NAPL.

Subsurface soils from the Morton Facility do not meet this standard; organic detections in most samples are below 1 mg/kg. The highest organic level observed for any sample is only 160 mg/kg (toluene in UAW04-20-10').

Considering only the overall level of organic contamination in soils may be ineffective, however, if residual contents are low or if the NAPL residual is distributed heterogeneously in the soil samples. This concern prompted the authors of "A Method for Assessing Residual NAPL Based on Organic Chemical Concentrations in Soil Samples" (Feenstra, *et al.*, 1991) to develop a more rigorous NAPL assessment method, using the results of chemical and physical analyses of the soil and the fundamental principles of chemical partitioning. This method has become widely accepted and is referenced in USEPA publications, including Estimating Potential for Occurrence of DNAPL at Superfund Sites (USEPA, 1992) and the Soil Screening Guidance (USEPA, 1996).

Laboratory analyses include the extraction of compounds from the sample either by leaching or heating. The results of such analyses represent the total mass of a chemical that is:

- dissolved in the pore water of the sample,
- sorbed on the soil solids,
- a NAPL, and
- in the soil gas.

The assessment tool developed by Feenstra et al. is based on the principle that the presence of a NAPL will cause the soil concentration to exceed the soil's capacity for that chemical in dissolved, sorbed, or soil gas phases. In this case, the hypothetical maximum total soil concentration would be exceeded and the calculated pore-water concentration would exceed the solubility of that chemical:

$$C_{sat} = \frac{S\left(K_{oc}\, f_{oc}\, \rho_b + \phi_w + H_c\, \phi_a\right)}{\rho_b}$$

Where:

C_{sat} = hypothetical total soil concentration resulting when the pore-water concentration exceeds the solubility of the chemical. At concentrations above C_{sat}, a NAPL would be present.

S = solubility in water (mg/l)

K_{oc} = organic carbon – water partition coefficient (cm^3/g)

f_{oc} = fraction of organic carbon (unitless)

ρ_b = bulk dry density (g/cm^3)

H_c = Henry's Law Constant (dimensionless)

ϕ_w = water filled porosity (unitless)

ϕ_a = air filled porosity (unitless)

Table 1 is a list of the maximum observed concentrations for all organic compounds detected in the set of stained soils identified by the USEPA. The physical/chemical properties, soil organic carbon- partitioning coefficients, and Henry's Law constants are also tabulated in Table 1. Two scenarios were considered in performing the NAPL screening:

- Scenario 1 in Table 1 uses default values for soil density, fraction of organic carbon, and porosity from USEPA's Soil Screening Guidance; and
- Scenario 2 in Table 1 uses the same default values for soil density and porosity, but uses a value for fraction of organic carbon derived from actual Total Organic Carbon data from FI soil samples.

Under either scenario, none of the soil samples contained concentrations indicating the presence of a residual NAPL.

Additionally, the maximum groundwater concentrations from sampling points coinciding with the observation of stained soils were all small fractions of the solubility limits for individual compounds (Table 2).

In the absence of these other indicators, staining alone is not sufficient scientific evidence to support a conclusion that residual NAPL is present. Many of the soils exhibit elevated levels of sulfides, suggesting the presence of predominantly reducing conditions (Table 3). Soils contain significant concentrations of iron and manganese, both of which can cause gray or black staining when reduced. The explanation that is most consistent with all available data, is that the staining is the result of reduced iron, manganese, and possibly other metals. The presence of reducing conditions in groundwater from this area may be related to dissolved organics (e.g., acetone, toluene) observed in groundwater.

A mobile NAPL has not moved through the stained soils.
The physical laws governing multiphase flow through a porous media dictate that a mobile NAPL will leave a residual NAPL behind. The persistence of residual NAPL has been widely documented in technical and regulatory literature (Schwille, 1989; Fetter, 1993). This persistence is one of the primary reasons for the EPA's and industry's move away from pump and treat as a cleanup (vs. a hydraulic control) method. Because residual NAPL is no longer mobile in bulk, it can only be gradually removed by dissolution, volatilization, degradation, and other processes. These processes tend to be very slow for most hydrocarbons in most settings.

Basically, if a mobile NAPL has historically moved through the now-stained soils, we should see a residual NAPL now. As discussed above, the data does not indicate the presence of a residual NAPL in site soils. The absence of a residual NAPL in soils at the site strongly indicates the absence of a mobile NAPL in the past.

Response To Additional
U.S. Environmental Protection Agency (USEPA) Comments
on the Facility Investigation Report

Morton International, Inc.
Reading, Ohio

Issue 2 – Matrix Masking

As stated in the discussion of Issue 1, the soil and groundwater concentrations in stained soils are not consistent with the presence of a residual or mobile NAPL. In their additional comment, the USEPA suggested organic concentrations may be biased toward lower concentrations, based on the possibility of matrix effects.

Matrix effects occur in solid or semi-solid media when some characteristic of the sample matrix (soil, sediment, etc.) interferes with the extraction or analytical method. The USEPA expressed concern that the sorbed material causing the staining (which they suspect to be residual NAPL) may mask, bind, or degrade organics. The USEPA comments that this could possibly prevent the analytical methods from accurately measuring the true concentrations of organics, causing the FI to miss organic contaminants in soil, or to bias the measured concentrations low. If this were to occur, organic concentrations that would provide evidence of NAPL may be present but hidden in the soil matrix.

Based on a review of the analytical methods, soil geochemical data, and quality control data, and on the findings of a focused review by the third-party data validator for this project (see attached report), Geomatrix concludes the following:

Any masking effects would be apparent based on data quality indicators. Such a review does not support the presence of matrix masking.
As a part of Geomatrix's review of this issue, the project third-party data validation firm, Environmental Standards, Inc., was requested to evaluate the laboratory reports for any indication of matrix masking. Their report is attached. In summary, their conclusion is that none of the data suggests the presence of any common or pervasive masking effect. Among other criteria, they reviewed the surrogate recovery and matrix spike analyses for the stained samples; both of these measure the impact of any matrix effects. The surrogate recovery and matrix spike analysis data do not indicate that matrix effects are present or have played a role in concealing chemical evidence of a residual NAPL in these soils.

Response To Additional
U.S. Environmental Protection Agency (USEPA) Comments
on the Facility Investigation Report

Morton International, Inc.
Reading, Ohio

Issue 3 – Historical Dissolved-Phase Transport

A limited number of ways exist in which contaminants from Morton Facility releases could reach Mill Creek. In the absence of surface transport or a NAPL phase, the only significant pathway is the movement of contaminants dissolved in groundwater within the shallow UA Sand. Potential transport is limited to those constituents observed in shallow UA Sand groundwater at the Morton Facility. *[It should be noted, however, that the simple presence of a compound in Morton Facility groundwater does not indicate that it originated from a SWMU or other release point at the Morton Facility.]*

In their additional comment, USEPA has acknowledged that "a dissolved phase [of PAHs, PCBs, and other bioaccumulative compounds] does not appear to be present under current conditions." USEPA has expressed concern, however, that such a dissolved phase may have previously been present, and has now degraded, attenuated, or otherwise become undetectable. If this were the case, then compounds detected in Mill Creek could conceivably be attributed to Morton Facility releases, even if there is no indication of these compounds currently in groundwater.

After reviewing the available data on this issue, Geomatrix has reached the following conclusions:

The geochemical data does not indicate that PCBs, PAHs, and pesticides are derived from current or historic releases at the Morton Facility.

- These compounds are present in soils in very low concentrations, and are widely distributed across the site. There is no indication of a source area at the Morton Facility; i.e., a cluster of high concentrations in soils. Of the 24 sampled soil intervals listed by USEPA as exhibiting staining or discoloration:
    - Only one exhibited detectable concentrations of PAHs.
    - 11 did not exhibit detectable levels of either PCBs or pesticides.
- Detections of these compounds in groundwater are very low (typically J-coded) and also widely scattered. Again, there is no data suggesting a source on site.
- Only one significant detection of PCBs has been observed in on-site groundwater, (130 µg/l of Aroclor 1242 at well UAW16-10). As described in the response to the BRA, no PCBs were detected in either a duplicate sample or another sample collected just a month later. In addition, no PCBs were detected in soils at or near this location. In summary, this detection is highly suspect, and is not believed to represent actual impact.

- The primary PCB isomer detected in Mill Creek sediment is Aroclor 1248. This constituent was not detected in any site groundwater sample, and was only detected at a low qualified concentration in one soil sample (0.011J mg/kg at T-3-3').

For PCBs, PAHs, and pesticides to be temporarily present in groundwater, then later undetectable, is not consistent with the environmental behavior of these compounds. These compounds are notoriously persistent in the environment, being relatively insoluble and nonvolatile, and highly resistant to biodegradation. These compounds also do not travel rapidly in groundwater, given their low solubility and affinity for sorption to soil material, especially organic carbon. To illustrate this, travel times were calculated for PCBs, pyrene, and 4,4'-DDE from the French drain to the east bank of Mill Creek, a distance of approximately 100 feet (see attached calculation sheets). These calculations were based on site-specific levels of organic carbon in soils, and on shallow UA Sand groundwater flow velocities developed from the results of the French drain pumping test. Using accepted methods for calculating retardation, it would require from roughly 90 years (pyrene) to over 3800 years (4,4'-DDE) for compounds to travel from the French drain to the creek as a dissolved phase.

If a dissolved phase plume containing PCBs, PAHs, or pesticides had ever been present at the site, given the persistence and slow movement of these compounds, it is reasonable to believe that such a plume would still be present. In contrast, very low concentrations of these compounds are observed in groundwater at a small number of locations scattered across the Morton Facility.

Impact from PCBs, PAHs, and pesticides observed at or near the water line in Mill Creek is not likely to have been derived from seeps.
USEPA has noted that groundwater likely discharges to surface water at the water line of Mill Creek most of the time. This may be true, although there is not sufficient data currently to either support or refute this statement. This assumption is used by the USEPA, however, to support a conclusion that contaminants at the water line are therefore "expected to be largely related to migration of contamination from groundwater to surface water."

This conclusion is not consistent with available data for the site. A molecule of benzo(a)pyrene, for example, in sediments at the water line could have potentially come from one of four sources:

- It could migrate there with groundwater from sources at the Morton Facility or upgradient;

- It could migrate there with surface water or sediment from upstream sources along Mill Creek;
- It could be deposited from airborne sources such as particulate emissions from local combustion sources; or
- It could have been deposited there with fill material during the rechannelization of this reach of Mill Creek—a small fragment of asphalt mixed with the concrete rip rap used in the stream channel, for example, would cause detections of several PAHs.

In evaluating the most likely source of that benzo(a)pyrene, several factors should be considered:

- Surface water flow predominates greatly over groundwater flow. The French drain pumping test suggests that the overall yield capabilities of the shallow UA Sand are less than 10 gallons per minute for most of the western boundary of the Morton Facility. This assumes that some or most of that groundwater is not already being removed by current French drain operation. Documented Mill Creek low flow conditions (the most conservative case) are about 10 cubic feet per second (OEPA, 1994, Biological and Water Quality Study of Mill Creek and Tributaries), equivalent to about 4500 gallons per minute. Surface water flow, even under low flow conditions, is therefore several hundred times greater than anticipated groundwater discharge along the Morton Facility.
- Most of the bioaccumulative compounds identified by the USEPA tend to sorb strongly to organic carbon and to have low solubilities. Therefore, they would tend to be transported much more readily with sediment than in groundwater.
- The geochemical data is not consistent with a release of these compounds on the Morton Facility, nor are any releases documented in the plant history.
- There are numerous sources of these compounds, other than a Morton Facility release, in both the immediate vicinity of the Morton Facility and throughout the Mill Creek watershed.

Numerous other potential sources are present for these compounds that could more reasonably explain their presence in Mill Creek seeps and sediments.
PAHs, for example, may be derived from combustion-related air emissions and runoff from seal-coated asphalt pavement. The highest observed concentrations of PAHs in any FI soil sample were from a background location on City of Reading property north of Cincinnati Drum and the Pristine Site. Pesticides would be expected to have been widely applied historically within the Mill Creek watershed. PCBs are routinely derived from light ballasts, leaking transformers, and other sources. A large remediation, involving the removal of several thousand cubic yards of PCB-contaminated sediment, was performed on a tributary to Mill Creek less than ½ mile upstream from the Morton Facility. Further,

all of these groups of compounds (pesticides, PAHs, PCBs) were within the wastes released at the Pristine site.

To reiterate, Morton is committed to assessing bioaccumulative compounds, including PAHs, PCBs, and pesticides in Mill Creek seeps and sediments, in order to develop an adequate characterization of ecological and human health risk [see discussion of Issue 4]. Current data indicate, however, that Morton Facility releases are not the likely source of PCBs, PAHs, and pesticides in Mill Creek. The Morton Facility is not responsible for environmental impacts derived from other sources.

Response To Additional
U.S. Environmental Protection Agency (USEPA) Comments
on the Facility Investigation Report

Morton International, Inc.
Reading, Ohio

Issue 4 – Detection of Compounds in Seeps and Sediments

Geomatrix originally selected analytical parameters for Mill Creek based on:

- Their presence in Morton Facility groundwater, and
- The potential for those compounds to have been derived from Morton Facility releases, based on available geochemical data.

This approach was used to develop the SED-TAL parameter list for sediment and seep samples. In the additional comment and in comments on the BRA, the USEPA has since stated that recent regulatory guidance requires the collection of a more complete data set to support the quantitative assessment of risk, even though compounds within that data set may not have originated from Morton Facility releases.

Based on USEPA's request in the additional comment, Morton proposes to use the following phased approach for revising the list of Mill Creek and groundwater analytes:

Phase 1—Sample seeps on the east bank of Mill Creek along the Morton Facility boundary. Analyze these seep samples for the VOC, SVOC, PCB, and pesticide analytes from the App IX-TAL parameter list (see the Table A1-2 of Quality Assurance Project Plan [QAPP] in Appendix A of the FI Work Plan). This will be designated the SEEP-TAL.

Phase 2—Sample sediments in Mill Creek. Analyze the sediments for the sediment target analyte list (SED-TAL) previously developed for the FI, revised as discussed below. This revised sediment analyte list will be designated SEDR-TAL, and will consist of all parameters in the original SED-TAL, plus any additional parameter:

- Detected in seep sampling from Phase 1.
- Detected by TechLaw, Inc. in their 2001 sediment sampling in Mill Creek.
- Detected in any on-site groundwater sample.
- Listed in Table 4-2 of *Bioaccumulation Testing and Interpretation for the Purpose of Sediment Quality Assessment, Status & Needs* (USEPA, 2000), as long as that chemical is also present in the existing App IX TAL (Table A1-2 of the QAPP). Prior to finalizing the SEDR-TAL, Morton may exclude specific compounds listed in this bioaccumulative table; as requested, the USEPA will be provided with a specific justification for any exclusion.

The data collected for seeps and sediments will be utilized in the quantitative assessment of risks related to Mill Creek receptors. Compounds in Mill Creek that are not derived from releases at the Morton Facility will be screened out by the USEPA for the purposes of Risk Management decisions, however, and Morton will not be required to assess the extent of these compounds, or to remediate them.

Table 1
Evaluation for Presence of Residual NAPL
Morton International, Inc.
Reading, Ohio

Calculate the NAPL Indicator Soil Concentration using the following equation:

$$C_{sat} = \frac{S\left(K_{oc}\, f_{oc} \rho_b + \phi_w + H_c\, \phi_a\right)}{\rho_b}$$

Soil Properties				Scenario 1	Scenario 2
Bulk dry density	ρ_b	g/cm3		1.5	1.5
Fraction organic carbon	f_{oc}	unitless		0.006	0.0034
Water filled porosity	ϕ_w	unitless		0.15	0.15
Air filled porosity	ϕ_a	unitless		0.28	0.28

	Ref.	Koc (cm^3/g)	Water Solubility (S) (mg/L)	Henry's Law Constant (H_c) (Dimensionless)	Scenario 1 NAPL Indicator Soil Concentration (mg/kg)	Scenario 2 NAPL Indicator Soil Concentration (mg/kg)	Maximum Detection - "Stained Soils" (mg/kg)
VOCs							
2-Butanone (MEK)	2	1.91E+00	2.40E+05	1.94E-03	26831	25642	0.64
Acetone	1	5.75E-01	1.00E+06	1.59E-03	103747	102252	15
Benzene	1	5.89E+01	1.75E+03	2.28E-01	868	600	0.19
Carbon disulfide	1	4.57E+01	1.19E+03	1.24E+00	721	579	0.38
Chlorobenzene	1	2.19E+02	4.72E+02	1.52E-01	681	412	1.6
Cyclohexane	3, 5	7.23E+02	5.75E+01	7.95E+00	340	232	0.026
Ethylbenzene	1	3.63E+02	1.69E+02	3.23E-01	395	236	5.7
Isopropylbenzene	3	2.82E+03	5.00E+02	3.16E-01	8505	4871	0.24
Methyl acetate	3, 5	3.45E+00	3.19E+05	4.06E-03	35882	35882	6
Methylcyclohexane	3, 5	1.65E+03	1.52E+01	1.78E+01	137	137	1.3
Methylene chloride	1	1.17E+01	1.30E+04	8.89E-02	2428	2033	5.6
Toluene	1	1.82E+02	5.26E+02	2.72E-01	654	405	160
Xylenes (total)	2	2.40E+02	1.98E+02	2.93E-01	316	192	50
SVOCs							
1,2-Dichlorobenzene	1	6.17E+02	1.56E+02	7.79E-02	595	345	14
1,3-Dichlorobenzene	2	1.70E+02	1.10E+02	1.95E-01	127	79	0.26
1,4-Dichlorobenzene	1	6.17E+02	7.38E+01	9.96E-02	282	164	1.3
2,4-Dimethylphenol	1	2.09E+02	7.87E+03	8.20E-05	10656	6380	24
2-Methylnaphthalene	2	4.37E+03	2.54E+01	1.85E-02	668	380	3.1
2-Methylphenol	1	9.12E+01	2.60E+04	4.92E-05	16827	10662	15
4-Methylphenol	2	8.13E+01	2.30E+04	3.99E-05	13517	8657	35
Acenaphthylene	2	6.92E+03	3.93E+00	4.74E-03	164	93	3.3

Table 1
Evaluation for Presence of Residual NAPL
Morton International, Inc.
Reading, Ohio

	Ref.	Koc (cm^3/g)	Water Solubility (S) (mg/L)	Henry's Law Constant (H_c) (Dimensionless)	Scenario 1 NAPL Indicator Soil Concentration (mg/kg)	Scenario 2 NAPL Indicator Soil Concentration (mg/kg)	Maximum Detection - "Stained Soils" (mg/kg)
Aniline	2	9.12E+00	3.60E+04	5.82E-05	5570	4717	22
bis(2-Ethylhexyl) phthalate	1	1.51E+07	3.40E-01	4.18E-06	30804	17456	150
Dibenzofuran	3, 4	8.13E+03	1.00E+01	5.34E-04	490	278	3.5
Fluoranthene	1	1.07E+05	2.06E-01	6.60E-04	132	75	4.6
Fluorene	1	1.38E+04	1.98E+00	2.61E-03	164	93	4.3
Naphthalene	1	2.00E+03	3.10E+01	1.98E-02	375	214	3.8
Phenanthrene	2	1.41E+04	9.94E-01	5.40E-03	84	48	9.8
Phenol	1	2.88E+01	8.28E+04	1.63E-05	22588	16388	13
Pyrene	1	1.05E+05	1.35E-01	4.51E-04	85	48	4.3
Pesticides and PCBs							
4,4'-DDE	1	4.47E+06	1.20E-01	8.61E-04	3218	1824	0.2
beta-BHC	1	1.26E+03	2.40E-01	3.05E-05	2	1	0.0038
Endrin aldehyde	3	2.69E+04	2.60E-01	1.58E-05	42	24	0.19
Aroclor 1016	1, 2	3.09E+05	7.00E-01	2.27E-02	1298	735	0.016
Aroclor 1242	1, proxy*	3.09E+05	7.00E-01	2.27E-02	1298	735	0.48
Aroclor 1254	1, 2	3.09E+05	7.00E-01	1.12E-01	1298	736	0.071

References: Physicochemical parameters were obtained from the following sources.

1 - Soil Screening Guidance - Attachment C, Chemical Properties, USEPA Publication 9355.4-23, July 1996.

2 - Chapter 30 TAC (Texas Adminstrative Code), Figure 350.73(c).

3 - Groundwater Chemicals, Desk Reference, John H. Montgomery, 1996.

4 - Region 9 PRG Tables for Phys-Chem data, 10/10/02.

5 - Koc calculated using the following equation from Contaminant Hydrogeology, C.W. Fetter, 1993: log Koc =3.95 - 0.62 log S, with S in mg/l.

* The solubility of Aroclor 1016 was used as a proxy solubility for Aroclor 1242, in the absence of this parameter in the above Reference Documents.

Table 2
Comparison of Groundwater Maximum Concentrations to Solubility Limits
Morton International, Inc.
Reading, Ohio

Groundwater Chemical	Maximum Detection in "Stained Soil" Monitoring Wells (mg/l)	Water Solubility (mg/l)	Percent of Solubility	Ref
VOCs				
1,1,1-Trichloroethane	0.098	1300	0.0075%	4
1,1,2-Trichloro-1,2,2-trifluoroethane	0.0048	200	0.0024%	2
1,1,2-Trichloroethane	0.0042	4400	0.0001%	4
1,1-Dichloroethane	0.058	5060	0.0011%	1
1,1-Dichloroethene	0.011	2250	0.0005%	1
1,2-Dichloroethane	0.41	8520	0.0048%	1
1,2-Dichloroethene (total)	0.11	6300	0.0017%	1, A
2-Butanone (MEK)	0.75	240000	0.0003%	2
4-Methyl-2-pentanone (MIBK)	0.022	19000	0.0001%	2
Acetone	45	1000000	0.0045%	1
Benzene	0.11	1750	0.0063%	1
Carbon disulfide	0.41	1190	0.0345%	1
Chlorobenzene	1.4	472	0.2966%	1
Chloroethane	0.0044	5700	0.0001%	4
Chloroform	0.041	7920	0.0005%	1
cis-1,2-Dichloroethene	0.1	3500	0.0029%	1
Cyclohexane	0.00073	57.5	0.0013%	3
Dichlorodifluoromethane	0.00041	280	0.0001%	2
Ethylbenzene	0.057	169	0.0337%	1
Isopropylbenzene	0.00034	500	0.0001%	3
Methylcyclohexane	0.0035	15.2	0.0230%	3
Methylene chloride	0.2	13000	0.0015%	1
Tetrachloroethene	0.02	200	0.0100%	1
Toluene	21	526	3.9924%	1
trans-1,2-Dichloroethene	0.0033	6300	0.0001%	1
Trichloroethene	0.0079	1100	0.0007%	1
Vinyl chloride	0.0021	2760	0.0001%	1
Xylenes (total)	0.19	198	0.0960%	2
SVOCs				
1,1'-Biphenyl	0.0073	7.5	0.0973%	4
1,2,4-Trichlorobenzene	0.0024	300	0.0008%	1
1,2-Dichlorobenzene	1.9	156	1.2179%	1
1,3-Dichlorobenzene	0.041	110	0.0373%	2
1,4-Dichlorobenzene	0.23	73.8	0.3117%	1
2,4-Dichlorophenol	0.0028	4500	0.0001%	1
2-Chlorophenol	0.0063	22000	0.0000%	1

Table 2
Comparison of Groundwater Maximum Concentrations to Solubility Limits
Morton International, Inc.
Reading, Ohio

Groundwater Chemical	Maximum Detection in "Stained Soil" Monitoring Wells (mg/l)	Water Solubility (mg/l)	Percent of Solubility	Ref
2-Methylphenol	0.14	26000	0.0005%	1
4-Methylphenol	0.33	23000	0.0014%	2
Acenaphthene	0.0064	4.24	0.1509%	1
Aniline	12	36000	0.0333%	2
Benzaldehyde	0.053	3300	0.0016%	5
bis(2-Ethylhexyl) phthalate	0.0034	0.34	1.0000%	1
Butyl benzyl phthalate	0.0027	2.69	0.1004%	1
Caprolactam	0.019	5250000	0.0000%	6
Pesticides and PCBs				
4,4'-DDD	0.000074	0.09	0.0822%	1
4,4'-DDE	0.000024	0.12	0.0200%	1
4,4'-DDT	0.000022	0.025	0.0880%	1
Aldrin	0.00003	0.18	0.0167%	1
alpha-BHC	0.00032	2.00	0.0160%	1
alpha-Chlordane	0.000053	0.051	0.1039%	3
beta-BHC	0.00051	0.24	0.2125%	1
delta-BHC	0.000058	31.4	0.0002%	3
Dieldrin	0.00052	0.195	0.2667%	1
Endosulfan I	0.000021	0.53	0.0040%	3
Endosulfan II	0.00014	0.28	0.0500%	3
Endrin aldehyde	0.000097	0.26	0.0373%	3
Endrin ketone	0.00014	0.23	0.0609%	3, B
gamma-BHC (Lindane)	0.000041	6.8	0.0006%	1
Heptachlor	0.00049	0.18	0.2722%	1
Heptachlor epoxide	0.00091	0.2	0.4550%	1
Isodrin	0.000017	0.18	0.0094%	1, C
Aroclor 1242*	0.00092	0.7	0.1314%	1

References: Physicochemical parameters were obtained from the following sources.

1 - Soil Screening Guidance - Attachment C, Chemical Properties, USEPA Publication 9355.4-23, July 1996.

2 - Chapter 30 TAC (Texas Administrative Code), Figure 350.73(e).

3 - Groundwater Chemicals, Desk Reference, John H. Montgomery, 1996.

4 - Region 9 PRG Tables for Phys-Chem data, 10/10/02.

5 - Handbook of Environmental Data on Organic Chemicals, Second Edition, Karel Verschueren, 1983 by Van Nostrand Reinhold.

6 - California Air Resources Board, Compound Summaries, updated October 4, 2001.

A - The solubility value for trans-1,2-Dichloroethene was used as a proxy value for total 1,2-Dichloroethene.

B - The solubility value for Endrin was used as a proxy value for Endrin ketone.

C - The solubility value for Aldrin was used as a proxy value for Isodrin.

* As discussed in the response text, the highest detection of PCBs in groundwater was 130 ug/l in an October 21, 2001 sample from UAW16-20. Because this value was not reproducible in either a duplicate or in a subsequent sample, Geomatrix considers it highly suspect. Based on this concern, this value was not used for the maximum for Aroclor 1242. Instead, the second-highest concentration detected was utilized in this comparison.

Table 3
Sulfide, Iron, and Manganese Concentrations
Morton International, Inc.
Reading, Ohio
Units: mg/kg

Sample Location - Stained Soils	Sample Date	Acid-insoluble Sulfide	Acid-Soluble Sulfide	Iron	Manganese
DP01-2'	7/24/2001	NA	<58	11100	302
DP02-2'	7/24/2001	NA	63	11900	265
DP08-11'	7/26/2001	NA	180	12800	306
DP10-2'	7/27/2001	NA	<56	NA	NA
DP10-10'	7/27/2001	NA	1400	NA	NA
DP10-10' (Dup)	7/27/2001	NA	820	NA	NA
DP20-14.5'	7/30/2001	170	NA	3500	261
STR01-21'	3/8/2001	<56	NA	4860	264
STR01-73'	3/9/2001	<60	NA	9400	491
STR01-88'	3/9/2001	<57	NA	10700	538
STR02-12.5'	3/13/2001	800	NA	5330	192
STR03-4'	3/14/2001	800	NA	NA	NA
STR03-12.5'	3/14/2001	340	NA	NA	NA
STR04-17.5'	3/19/2001	760	NA	7050	259
STR04-17.5' (Dup)	3/19/2001	550	NA	7110	318
STR05-9'	3/10/2001	<58	NA	14200	2120
STR05-11.3'	3/10/2001	110	NA	9020	432
STR07-18'	3/21/2001	<120	NA	6390	314
STR08-13'	3/26/2001	280	NA	13400	587
STR08-13' (Dup)	3/26/2001	290	NA	9380	414
UAW04-20-10'	3/23/2001	30 B	NA	14600	483
UAW05-20-13'	3/23/2001	220	NA	20500	482
UAW06-20-11.5'	3/26/2001	<56	NA	4150	387
UAW08-20-13'	3/24/2001	340	NA	NA	NA
UAW11-40-10'	4/17/2001	120	NA	6680	232
UAW12-20-12'	3/24/2001	560	NA	NA	NA
UAW13-20-11.5'	3/24/2001	430	NA	NA	NA
UAW17-40-5'	4/5/2001	<64	NA	16900	940
UAW18-20-15'	8/23/2001	NA	<61	7670	295
UAW20-60-9.5'	4/9/2001	39 B	NA	25500 MBB	318

Notes:

B = Estimated result; result is less than reporting limit.

MBB = This analyte is present at a reportable level in the associated method blank but is less than 5% of the sample amount.

NA indicates chemical was not on the target analyte list for that sample.

Report from Environmental Standards

March 4, 2003

Mr. Mark P. Hemingway
Principal Hydrogeologist
Geomatrix Consultants, Inc.
5725 Highway 290 West
Suite 200-B
Austin, Texas 78735

Reference: Evaluation of Laboratory Data for Select Samples (Described as "Stained" or "Discolored") Analyzed by STL North Canton for the Morton International, Inc., Reading, Ohio RCRA Facility Investigation

Dear Mr. Hemingway:

As an extension of the on-going third-party data validation activities for the Morton International, Inc., Reading, Ohio RCRA Facility Investigation (RFI), Environmental Standards, Inc. (Environmental Standards) has been requested to rigorously examine the summary and raw analytical data generated by STL North Canton for 30 select soil samples. The 30 soil samples were analyzed for TCL or Appendix IX volatile organics (SW-846 Method 8260B), TCL or Appendix IX semivolatile organics (SW-846 Method 8270C), TCL or Appendix IX pesticides by SW-846 Method 8081, PCBs by SW-846 Method 8082, TCL or Appendix IX metals by SW-846 6000 and 7000 series methods, and several wet chemistry parameters (*viz.*, cyanide, acid-soluble sulfides and acid-insoluble sulfides). The 30 soil samples included in this evaluation were reported by STL North Canton within nine separate sample delivery groups (SDGs). The designated sample location, the field identification, and the SDG designation for each sample included in the evaluation are listed on Table 1.

Table 1
Samples Described as "Stained" Included in this Evaluation

Sample Location	Field ID	SDG	Sample Location	Field ID	SDG
DP01-2'	72401122	1G2503	STR05-9'	31001014	1C0928
DP02-2'	72401124	1G2503	STR05-11.3'	31001016	1C0928
DP08-11'	72601134	1G2503	STR07-18'	32101043	1C20147
DP10-2'	72701137	1G2503	STR08-13'	32601055	1C27154
DP10-10'	72701138	1G2503	STR08-13' (Dup)	32601056	1C27154
DP10-10' (Dup)	72701136	1G2503	UAW04-20-10'	32301045	1C20147
DP20-14.5'	73001159	1G2503	UAW05-20-13'	32301047	1C20147
STR01-21'	30801003	1C0928	UAW06-20-11.5'	32601060	1C27154
STR01-73'	30901009	1C0928	UAW08-20-13'	32401053	13135A
STR01-88'	30901010	1C0928	UAW11-40-10'	41701088	A1D180206
STR02-12.5'	31301026	13135A	UAW12-20-12'	32401049	13135A
STR03-4'	31401031	13135A	UAW13-20-11.5'	32401051	13135A

Sample Location	Field ID	SDG	Sample Location	Field ID	SDG
STR03-12.5'	31401032	13135A	UAW17-40-5'	4050171	1D3243
STR04-17.5'	31901037	1C20147	UAW18-20-15'	82301180	1H21183
TR04-17.5' (Dup)	31901038	1C20147	UAW20-60-9.5'	40901083	1D0130

The purpose of the evaluation of the referenced select soil samples was to:

- To ascertain if there is anything in common with regard to the organic, inorganic, and wet chemistry analytical results, quality control information, or anything additional within the raw instrumental data (*e.g.*, chromatographic signatures) that can be used to identify a common contaminant source, such as a residual non-aqueous phase liquid (NAPL).

- To ascertain if the data suggest any matrix or "masking" effect that would have prohibited the extensive organic and inorganic characterization that was performed by STL North Canton from identifying and quantitating any additional organic or inorganic analytes that were otherwise suppressed due to the sample matrix.

Potential Common Contaminant Source Material Within Black "Stained" Soils

A number of the subject soil samples contained a variety of volatile organics (*e.g.*, ketones and aromatics), semivolatile organics (*e.g.*, dichlorobenzenes, cresols, PAHs), PCBs, metals, and sulfides. Some of the soil samples within this data set appear to be free of organic compounds and the inorganic data do not suggest the presence of environmental pollutants. Other soil samples within this data set indicate ketone, BTEX, and chlorinated benzene contamination, while other samples indicate the presence of low-levels of pesticides and/or PCBs. The metals data are generally unremarkable with the possible exception of the presence of tin in a few samples. Varying levels of sulfides were also detected in a number of soil samples.

Based on a rigorous evaluation of the volatile, semivolatile, pesticide, and PCB chromatograms, there does not appear to be a common pattern, either as target compounds or as *non-target* chromatographic responses (*e.g.*, degraded target compounds), that can used to characterize the collective 30 soil samples as having a common contaminant source such as a NAPL. Similarly, the metals, cyanide, and sulfide data for the collective 30 soil samples do not provide an obvious connection to a single pattern of contamination.

Possible Sample Matrix or "Masking" Effect

It has been theorized that the collective 30 soil samples have some physical and/or chemical characteristic that prevented STL North Canton from detecting and quantitating organic and inorganic target analytes that could effectively connect these 30 soils samples to a single pattern of contamination.

In terms of the matrix or "masking" effects, the most effective indicators are the various quality control samples that are prepared and analyzed. Surrogate recoveries (organic) and matrix spike recoveries (organic and inorganic) are specifically designed to provide the data users with information relating to sample-specific matrix effects and interferences, including, but not limited to, masking or suppression.

Examination of the raw data for the 30 samples indicates that in more than 90% of the cases, all surrogate recoveries, matrix spike recoveries, and other sample-specific QC were within acceptable tolerance. In those cases when the organic recoveries were not within acceptable tolerance, either the recoveries were slightly high (indicating a positive bias) or the sample had been diluted to properly quantitate elevated levels of target compounds. In a few minor cases, slightly low recoveries were observed for the inorganic faction (*e.g.*, cyanide). Accordingly, none of the information contained in the comprehensive data packages prepared by STL North Canton suggests a pervasive or even common matrix effect (masking, suppression, *etc.*). In fact, based on the collective raw data evaluated for the 30 soil samples, it can be stated with a high degree of certainty that the analytical methods that were used were appropriate and successfully characterized the targeted organic and inorganic target analytes.

In summary, it is my opinion that the analyses that were performed by STL North Canton represent valid data for the targeted organic and inorganic target analytes.

If you have any questions/comments, please do not hesitate to call or e-mail me.
mailto:RVitale@EnvStd.com

Sincerely

Rock J. Vitale, CEAC, CPC
Technical Director of Chemistry/
Principal

ENVIRONMENTAL STANDARDS, INC.
1140 Valley Forge Road
Valley Forge, PA 19482-0810
(610) 935-5577
www.EnvStd.com

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Travel Time Calculations

Flow Rate Calculation Sheet

Purpose: Estimate horizontal groundwater flow rate using results of step-drawdown tests, French drain pumping test, and physical properties of compounds

Method: Use Darcy's Law to estimate water flow rate. Calculate Retardation factors based on water/organic carbon partition coefficient, site-specific value of percent organic carbon and an assumed value for bulk density.

Formulas: Darcy's Law for Pore Velocity

$$q = \frac{Ki}{\phi_e}$$

Where:

$q = average\ linear\ flow\ velocity\ (L/T)$
$K = hydraulic\ conductivity\ (L/T)$
$i = hydraulic\ gradient\ (L/L)$
$\phi_e = effective\ porosity\ (fraction)$

Retardation Factor

$$r_f = 1 + \frac{B_d}{\phi_T} K_d$$

Where:

$r_f = retardation\ factor\ (unitless)$
$B_d = Bulk\ density\ (g/ml)$
$\phi_T = Total\ porosity (fraction)$
$K_d = distribution\ coefficient\ (L^3/M)$

Distribution Coefficient

$$K_d = K_{oc}\ f_{oc}$$

Where:

$K_d = distribution\ coefficient\ (L^3/M)$
$K_{oc} = water/organic\ carbon\ partition\ coefficient\ (L^3/M)$
$f_{oc} = fraction\ organic\ carbon\ (unitless\ fraction)$

Velocity of a Retarded Constituent

$$V_c = \frac{q}{r_f}$$

Where:

$V_c = velocity\ of\ a\ retarded\ constituent\ (L/T)$
$q = average\ linear\ velocity\ of\ groundwater\ (L/T)$
$r_f = retardation\ factor\ (unitless)$

Calculations: Calculate water flow rate. First, determine the appropriate value for hydraulic conductivity.

One direct measurement is available from results of step-drawdown tests:

$K = 106\, ft/day$

An "average" K for west side of plant can also be estimated from French drain pumping test.

Assume trench is capturing all of the groundwater flow of the Shallow Zone in that area. Use Darcy's Law to calculate the groundwater flow toward the drain. Then determine the K needed to yield that flow. Rearranging Darcy's Law:

$$K = \frac{Q}{AI}$$

Where:

$K = hydraulic\ conductivity\ (L/T)$
$Q = Flow\ Rate\ From\ Drain\ (L^3/T)$
$I = hydraulic\ gradient\ (L/L)$
$A = cross\ section\ of\ aquifer\ through\ which\ groundwater\ flows\ (L^2)$

$A = W\,D$

Where:

$W = width\ of\ Capture\ Zone\ along (parallel\ to) the\ drain\ (L)$
$D = Average\ saturated\ thickness\ along\ French\ Drain\ (L)$
$Length\ of\ Drain = 700\ feet$
$Average\ Saturated\ Thickness\ of\ Upper\ Zone \cong 3.5\ feet = D$

Hydraulic gradient at start of test

$I = 0.013$

French Drain Flow Rate during Test

$$Q = 9.5\ \frac{gal}{\min}\left(\frac{ft^3}{7.48\,gal}\right)\left(\frac{1440\min}{day}\right)$$
$$Q = 1{,}829\frac{ft^3}{day}$$

Estimate width of aquifer contributing to flow at French Drain (Capture Zone) (Note :) It is assumed the flow to north end of drain is restricted by presence of slurry wall). Normally, Capture width of a trench exceeds 2x length of trench at an "infinite" distance up gradient. Assume 2x is typical. Reduce this to 1.5x since cannot expand capture zone at north end due to presence of slurry wall

$Contributing\ Width =$
$W = (700\,ft)(1.5)$
$W = 1050\,ft$

<u>K Calculation</u>

$$K = \frac{Q}{AI} = \frac{Q}{WDI}$$
$$K = \frac{1829\,ft^3/day}{(1050\,ft)(3.5\,ft)(0.013)}$$
$$K = 38\,ft/day$$

Calculate Average Linear Groundwater Flow Rate

$$q = \frac{Ki}{\phi_e} \qquad Assume \phi_e = 25\%$$

$$q = \frac{(38)(0.025)}{0.25}$$

$$q = 3.8\, ft/day \text{ or } 1{,}387\, ft/year$$

Calculate Flow Rate of Pyrene

Organic carbon/water partition coefficient

$$K_{oc} = 1.05x10^5\, ml/g$$

$$site\ specific\ \ foc(average\ of\ \ all\ \ on-site\ measurements) = 0.0034$$

$$K_d = K_{oc}\ f_{oc}$$

$$K_d = (1.05x10^5\, ml/g)(0.0034)$$

$$K_d = 357 ml/g$$

Calculate Retardation Factor

$$Assume\ B_d = 1.5 \frac{g}{ml}$$

$$Assume\ \phi_T = 43\%$$

$$r_f = 1 + \frac{B_d}{\phi_T} K_d$$

$$r_f = 1 + \frac{1.5}{0.43}(357)$$

$$r_f = 1{,}246$$

Retarded Flow Rate

$$V = \frac{q}{r_f}$$

$$V = \frac{3.8}{1{,}246}\, ft/day$$

$$V = 0.00305\, ft/day$$

$$or$$

$$V = 1.11\, ft/year$$

Calculate Flow Rate for DDE

$$K_{oc} = 4.47x10^6 ml/g$$
$$K_d = K_{oc}\ f_{oc}$$
$$K_d = (4.47x10^6 ml/g)(0.0034)$$
$$K_d = 15{,}198 ml/g$$
$$r_f = 1 + \frac{B_d}{\phi_T} K_d$$
$$r_f = 1 + \left(\frac{1.5}{0.43}\right)(15{,}198)$$
$$r_f = 53{,}017$$

Retarded Flow Rate

$$V = \frac{q}{r_f}$$
$$V = \frac{3.8}{53{,}017} ft/day$$
$$V = 7x10^{-5} ft/day$$
$$V = 0.0262 ft/year$$

Calculate Flow Rate for Aroclor 1242

Use Koc for "PCBs"

$$K_{oc} = 3.09x10^5 ml/g$$
$$K_d = K_{oc}\ f_{oc}$$
$$K_d = (3.09x10^5 ml/g)(0.0034)$$
$$K_d = 1050\ ml/g$$
$$r_f = 1 + \frac{B_d}{\phi_T} K_d$$
$$r_f = 1 + \left(\frac{1.5}{0.93}\right)(1050)$$
$$r_f = 3{,}666$$

Retarded Flow Rate

$$V = \frac{q}{r_f}$$

$$V = \frac{3.8}{3666}$$

$$V = 0.00104\, ft/day$$

$$V = 0.378\, ft/day$$

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF

DE-9J

MAR 20 2003

VIA E-MAIL AND
CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Peter V. Palena
Corporate Remediation Manager
Rohm and Haas Company
P.O. Box 584
Route 413 and State Road
Bristol, Pennsylvania 19007

Re: RCRA § 3013 Administrative Order
Facility Investigation and Additional Work
Morton International, Inc.
U.S. EPA ID No. 000 724 138

Dear Mr. Palena:

We have received and reviewed your responses to the comments from the United States Environmental Protection Agency (U.S. EPA) on the June 2002 Facility Investigation (FI) Report and Baseline Risk Assessment (BRA) for Morton International Inc. (Morton). Generally, Morton's responses to comments on the FI Report and BRA appeared adequate and consistent with U.S. EPA's recommendations and requirements. A final determination of adequacy will require review of the revised FI Report and BRA to confirm that the required changes were properly made, with an adequate level of detail, and that appropriate detailed calculations and references were included.

Overall, U.S. EPA considers that there are no remaining issues concerning the scope of work for the additional investigation. Some individual responses or aspects that require additional input or issues for consideration are discusses below.

Off-site sources

U.S. EPA will neither agree nor disagree with Morton's interpretation of whether some

contamination present in media at the facility may be attributable to off-site sources until the Agency has an opportunity to review a revised FI Report and a revised BRA based on the additional work required by U.S. EPA.

U.S. EPA will not comment on Morton's interpretation regarding the regulatory scope of the Administrative Order because Morton's proposed actions appear to address U.S. EPA comments on the FI Report and BRA.

Historical releases at the facility

U.S. EPA will not comment on Morton's interpretation regarding whether certain historical releases at the facility are outside the regulatory scope of the Administrative Order because Morton's proposed actions appear to address U.S. EPA comments on the FI Report and BRA.

The ditch that lies on the Pristine side of the Morton's property

Morton's responses indicate that "The current presence of the ditch does not indicate that such ditch was present 20 to 25 years ago when Pristine was actively managing the site." As clarification, figures and diagrams available from the Superfund files related to the Remedial Planning and Field Investigation at the Pristine site during the early 1980s indicate the presence of a ditch on the location referred to by Morton as "the Pristine side of the property."

Based on the above, any discussion of the Pristine ditch that may be included in the FI Report should be accurate and must reflect the facts available in the Superfund files.

Surface impoundments

Morton's discussion does not provide enough information that would serve to evaluate the appropriateness of the sampling approach for the surface impoundments. For example, to allow for appropriate application of the Soil Screening Guidance, contamination distribution patterns need to be considered (in this case, pre and post-excavation conditions would affect contamination distribution patterns). It is noted that by viewing the surface impoundments as a single impoundment it would not be recognized that sludges collected in the impoundments would have likely gravitated towards lower elevation areas within each impoundment in the sequence, with progressive settling of sludges from one to another through all six impoundments. Morton's response indicates that any correlation between soil impact and depth or soil stratification, as well as the basis for soil sample selection at any given locations, will be addressed in the revised FI Report. However, Morton does not discuss whether it expects to establish a lateral correlation between soil impact and the selected sample locations within the perimeters of the surface impoundments. The revised FI Report needs to confirm that the sampling approach for the surface impoundments remains appropriate to determine the lateral and vertical extent of contamination in the surface impoundments.

In the absence of appropriate substantiation that the soil data collected are sufficient, Morton shall conduct additional sampling and analysis to complete the characterization of nature and extent of contamination in the surface impoundments.

Chromium

Morton has indicated that hexavalent chromium is not likely to have been released, given the nature of the facility operations. The FI Report and BRA should appropriately substantiate the above statement by citing the chromium compounds associated with the facility operations and their related stoichiometry.

In the absence of appropriate substantiation regarding the characterization of chromium present at the facility, Morton shall either conduct appropriate sampling to demonstrate that chromium is present in the trivalent state, or re-run the risk calculations using hexavalent chromium chemical parameters and toxicity criteria.

Morton's response to U.S. EPA General Comment 4 regarding the BRA

Morton's response to General Comment 4 indicates that per the January 14, 2003 conference call between U.S. EPA and Morton, Morton is allowed to use federal maximum contaminant levels (MCLs) to screen groundwater and surface water constituents of potential concern (COPCs) from further analysis under the human health risk assessment (HHRA). It should be noted that the following COPCs exceeded U.S. EPA Region 9 Preliminary Remediation Goals (PRGs) but were removed from the risk assessment because they did not exceed their respective MCLs: 1,4-dichlorobenzene, heptachlor epoxide, and arsenic in surface water; and bromodichloromethane, chloroform, and cyanide in groundwater.

The revised BRA should provide an appropriate explanation that the level of cumulative risk being eliminated from the BRA as a result of screening out 1,4-dichlorobenzene, heptachlor epoxide, and arsenic in surface water; and bromodichloromethane, chloroform, and cyanide in groundwater, would not have resulted in a human health risk concern.

Morton's response to U.S. EPA General Comment 8 regarding the BRA

Morton's response indicates the facility is complying with previous direction from U.S. EPA on the Facility Investigation (FI) Work Plan, namely that the groundwater ingestion exposure route can be eliminated from the HHRA on the basis that either site-related COPCs have not migrated to the lower aquifer or that site-related COPCs in the lower aquifer do not exceed MCLs. Morton further indicates that appropriate institutional controls on the use of groundwater at the facility will be established during the remediation phase. Based on this discussion (which is to be expanded upon and added to the BRA), it appears that Morton's response to the issue of excluding groundwater ingestion in the HHRA is acceptable.

Morton's response to U.S. EPA General Comment 45 regarding the BRA

The response to Specific Comment 45 commits to either (1) re-calculating risks to reflect an alternate exposure point concentration for risk drivers, or (2) providing a comparison of exposure point concentrations for risk drivers in the T-1 area versus an expanded area of the site. The response does not indicate that the potential for further investigation and/or remediation of hot spots at the T-1 area will also be considered. Morton must acknowledge that these contingencies exist, in the event alternate risk-based concentrations are unusable at Area T-1.

Morton's response to U.S. EPA General Comment 52 regarding the BRA

There remain inconsistencies in the reporting of the Particulate Emission Factor (PEF) used for the construction worker. Appendices H and I indicate that a PEF of 2×10^7 cubic meters per kilogram (m^3/kg) was used. However, Table 4.4 reports a construction worker PEF of 4.4×10^8 m^3/kg.

The revised BRA should confirm that the proper PEF was used in calculating risks and the inconsistencies in the report text and tables should be corrected.

Responses to comments on the ecological portion of the BRA

Morton's responses to the technical comments provided by U.S. EPA on the ecological portion of the BRA all appeared adequate. A final determination of compliance and adequacy will require review of the revised BRA to confirm that the required changes were properly made with an adequate level of detail.

Key specific items requested by U.S. EPA for the ecological assessment are properly addressed by the responses to comments, namely:

- Morton has agreed not to screen out COPCs in the screening level ecological risk assessment (SERA) based on background levels or concentrations in upgradient or upstream areas.

- Morton has agreed to evaluate and screen chemicals it may consider to not be associated with facility releases in the SERA.

- Morton has clarified that current U.S. EPA guidance was used and will continue to be used throughout conduct of the SERA. Morton also agreed to re-evaluate exposure pathways, screening, and food chain risks in the SERA according to U.S. EPA's recommendations.

- Morton has agreed to further analyze the role of seeps into Mill Creek as contaminant transport pathways and to expand the dataset for polynuclear

aromatic hydrocarbons (PAHs) and other analytes in sediment by implementing additional sampling during the upcoming phase of the FI.

- Morton has agreed to include certain receptors (plants and invertebrates) excluded from the initial version of the BRA and clarify the rationale for not documenting the presence of other receptors, specifically invertebrates and fish in Mill Creek.

- Morton has agreed to provide a more detailed description of measurement endpoints used in the SERA.

- Morton has clarified the use of screening values and agrees to consider other sources of ecotoxicity benchmarks when U.S. EPA Region 5 Ecological Data Quality Levels (EDQLs) are not available.

As per the proposed schedule, Morton will submit a Work Plan for Additional Work upon sixty (60) days of receipt of this letter.

If you have any questions regarding this letter or if you feel that a meeting is necessary, please contact me at (312) 886-7567 or at "capiro.mirtha@epa.gov".

Sincerely,

Mirtha Capiro
Project Coordinator/Manager
Enforcement and Compliance Assurance Branch

cc: Thomas C. Nash, C-14J
Harold O'Connell, OEPA
Mark Hemingway, Geomatrix Consultants, Inc.

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REPLY TO:
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ROHM AND HAAS

21 February 2003

Ms. Mirtha Capiro
Enforcement and Compliance Assurance Branch
Waste, Pesticides and Toxics Division
U.S. Environmental Protection Agency
Region 5 (DE-9F)
77 West Jackson Street
Chicago, Illinois 60604-3590

Via: Electronic mail and Overnight mail

Re: Morton International, Inc.
Reading, Ohio Facility
RCRA Docket No. R3013-5-00-001

For your review, please find enclosed three copies of the *Responses to the USEPA Comments on the June 2002 Facility Investigation Report* and three copies of the *Responses to the USEPA Comments on the June 2002 Baseline Risk Assessment* prepared by Geomatrix Consultants for the above referenced project. These documents provide responses to comments provided by USEPA to Morton on November 24th, 2002. The comments were separated into three major categories:

1. Facility Investigation – Those comments pertaining to the June 2002 Facility Investigation Report.
2. Baseline Risk Assessment – Those comments pertaining to the June 2002 Baseline Risk Assessment.
3. Ten Percent Data Verification Review of the Data Validation – Those comments pertaining to the TechLaw Oversight Report.

The third set of comments about Data Verification do not reference any of the Morton submitted documents and therefore no responses have been provided for these comments.

Morton has proposed to meet with USEPA representatives at the facility to discuss the responses, and to scope the field activities remaining to finalize the characterization of the site. USEPA can propose an appropriate time for this meeting to occur once the responses to the additional comments are provided to the USEPA on March 7th, 2003. Morton proposes the following schedule for this

project. Please note that the schedule does not include the USEPA review tasks for the various submittals.

Task	Responsible Party	Date
Respond to Additional Comments	Morton	March 7th, 2003
Schedule Meeting to discuss additional information	USEPA	TBD (Mtg Date)
Additional Investigation Work Plan	Morton	Submittal 60 days after the Mtg Date
Additional Field Activities	Morton	Commence 30 days after USEPA approval of the Work Plan
Revised Facility Investigation (FI) Report	Morton	Submittal 90 days after Morton's receipt of all analytical data from Additional Field Activities
Revised Baseline Risk Assessment	Morton	Submittal 90 days after USEPA approval of the FI Report

Morton will conduct the additional field activities in accordance with the existing field procedures in the Facility Investigation Work Plan and the Quality Assurance Project Plan. The Additional Investigation Work Plan will document any new procedures or variances to the existing procedures for the proposed work. The Revised FI Report will incorporate all the modifications proposed in the responses to comment and the additional data from the field activities.

Thank you for your cooperation during this project. We look forward to continuing to work with you in a timely and efficient manner in addressing the issues at the facility. If you have any questions, please do not hesitate to contact me at (215) 785-7079.

Sincerely,

Peter V. Palena Jr.
Rohm and Haas Company
Corporate Remediation Manager

COMMENTS FROM THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (U.S. EPA) ON THE JUNE 2002 FACILITY INVESTIGATION REPORT

MORTON INTERNATIONAL, INC. (Morton)
READING, OHIO

I. GENERAL COMMENTS

1. The data and analysis provided in June 2002 Facility Investigation (FI) Report are helpful in addressing many of the informational needs identified for the Morton Reading facility and in meeting the objectives of the investigation specified in the Administrative Order. However, a number of issues and concerns have been identified regarding the investigation and the conclusions that can be drawn from these investigations. These issues and concerns are identified in the following Specific Comments.

Response:
In the June 2002 FI Report, Morton addressed each objective of the facility investigation set forth in the Administrative Order. Morton collected and analyzed over 265 samples of potentially impacted media. In conducting the FI, Morton followed the approved Work Plan as well as applicable U.S. EPA Guidance. Morton believes it has conducted a thorough and complete investigation. Morton is pleased to address U.S. EPA's issues and concerns so that the FI can be improved and finalized.

2. The FI Report indicates (Sections 2, 5, and 7) that many of the contaminants detected in the shallow soils on the site may be the result of off-site sources. Specifically, the following compounds are believed to have originated from off-site sources:

- Chloroethenes, chloroethanes, and chloroform;
- PAHs;
- PCBs;
- Pesticides and herbicides; and
- Certain metals (aluminum, barium, and vanadium).

The FI Report should provide a comprehensive list of contaminants detected during the FI which are likely attributable to an off-site source(s), and a detailed discussion of the transport mechanisms which would explain the contaminants' presence in the shallow soils of the site. In addition, the FI Report should include a discussion of the contaminants which are attributable to past and present operations at the Morton Facility. Contaminants which are attributable to the Morton Facility or are common to both the Morton Facility and potential off-site sources should be addressed in future investigative/remedial activities conducted by the Morton Facility.

Response:
Note: This response is also applicable to Specific Comments 1 and 10.

The revised FI Report will include the requested comprehensive list of contaminants detected during the FI that Morton interprets to be attributable to an off-site source(s), as well as the requested discussion of the transport mechanisms for these compounds. Morton will propose new parameter lists for future sampling, based on the probable source of each compound. At this time, the applicable transport mechanisms that have been identified, and will be discussed in the revised FI Report, are:

- **Surface runoff from neighboring properties located north and east of the Morton Facility. As shown on Figure 2-7 of the CCR, the surface drainage feature which runs parallel to the north property boundary of the Morton property is not very wide or deep. Currently it is an earthen swale with plant growth which is not sufficiently sized to prevent runoff from entering the Morton Facility. After a heavy rain, it is not uncommon to find that drums from the Cincinnati Drum Facility (presumably empty) have been carried by surface runoff to the chain link fence located on the Morton property. It is believed that historic and current rainfall run-off patterns are capable of transport onto the Morton Facility.**
- **Fugitive dust emissions of particulates from adjacent properties, including Cincinnati Drum, Pristine Superfund Site, Southern Ohio Asphalt Company, Reading Feed Mill, General Tool Inc., Aluchem Inc., Rosemont Industries, the neighboring railroad, and City of Reading property formerly used for the disposal of foundry sand and fly ash from the municipal incinerator.**
- **Air emissions/incinerator ash resulting from waste operations at the Pristine Site, including the historical operation of a hazardous waste incinerator.**
- **Lateral spreading of contaminants in the unsaturated zone (i.e., flow in localized perched zones, spreading due to capillary forces).**

If other transport mechanisms are identified, these will also be discussed in the revised FI Report.

Detailed information on chemical use and known releases at the Morton Facility, and on the nature and history of potential off-site sources of contamination, are presented in the following:

- **Section 2.2 of the Current Conditions Report (CCR) lists the manufactured products, raw materials, and wastes that have been associated with the Morton Facility since approximately 1950.**
- **Section 3.4 of the CCR further details the products, materials, and wastes associated with each solid waste management unit (SWMU) and other waste management and on-**

site waste disposal features.

- Section 4.0 and Appendix C of the CCR provide information regarding potential off-site sources of contamination.
- The U.S. EPA's regulatory files on the Pristine Superfund site.

The U.S. EPA initially requested that FI samples be analyzed for the entire Appendix IX list. Subsequent discussions with the U.S. EPA, prior to the implementation of the FI, eliminated radionuclides, certain herbicides, and selected other compounds, based on the low likelihood of these compounds originating from the Morton Facility. In accordance with the approved FI Work Plan, Morton analyzed FI samples for one of two broad suites of analytical parameters, termed the CLP-TAL and App IX-TAL, as specified in the approved FI Work Plan.

In terms of the rationale for screening certain compounds out of the FI and Corrective Action process, based on a likely off-site origin, Morton would like to offer a different perspective than that cited in the comment.

In a facility with as lengthy a history as the Morton Facility, a simple record of a chemical's use or presence in facility wastes is not conclusive evidence of a release of that compound. It is certainly adequate reason to include that compound in initial analyte lists, as Morton has done in the FI. After initial data is in hand, however, it is appropriate to use other techniques to conclude whether observed occurrences of that compound are derived from on- or off-site sources.

This is the approach that Morton has utilized. Compounds were concluded to be derived from off-site sources <u>only</u> if there was a known or reasonable off-site source for them, there was not a known on-site release of those compounds, and the physical evidence derived from the FI was more consistent with an off-site origin. Specifically, Morton considered any of the following to be strong evidence of off-site origin:

- Absence or near absence in the Shallow Upper Aquifer Sand groundwater, with presence primarily in deeper groundwater.
- Distribution in shallow groundwater reflecting highest concentrations near the Pristine Superfund Site, with generally declining concentrations moving west and south across the site.
- Occurrence in on-site soils primarily in the immediate vicinity of the Pristine Superfund site.
- Presence in on-site soils only at very low concentrations, and either in only a few scattered samples or widely distributed across the site primarily occurring in shallow soils. Occurrence only or primarily within a localized group of samples would not meet this criterion, and would be considered suggestive of an on-site potential source.

To reiterate, Morton has only concluded that a compound or group of compounds is derived from off-site sources if the historical and physical evidence is most consistent with that interpretation. Morton does believe that this approach is more appropriate for supporting these conclusions than a reliance on historical records of chemical use or waste generation. As will be discussed elsewhere, this approach suggests that an exhaustive review of every chemical ever used or every waste ever generated would not be time well spent. It should be noted, however, that such an effort has already been committed to identifying historical releases at the facility, by parties including Morton, the Ohio Environmental Protection Agency, and the U.S. EPA and their contractors. Based on the conclusions reached using this approach, the revised FI Report will identify those contaminants that may have been derived from releases from Morton Facility source areas identified in the Administrative Order.

Action:
Sections 2, 5, and 7 of the FI Report will be revised to reflect the information presented in this response.

3. The information from the FI Report is sufficient to conclude that contaminated groundwater from the Morton Facility is migrating into Mill Creek. Moreover, the information from the FI is sufficient to conclude that the French Drain and Groundwater Collection System may not be adequate in controlling migration of contaminated groundwater from the Morton Facility. Further investigations are necessary to evaluate whether the French drain and management of collected groundwater can be effective means of controlling the migration of contaminated groundwater.

Response:
As stated in the FI Report, Morton concurs with the comment of the U.S. EPA. One of the objectives of the FI was to characterize the effectiveness of the French drain.

Morton is addressing this issue as a near-term Interim Measure, and has evaluated the adequacy of the Groundwater Recovery System under varying operational conditions. This work was begun in summer 2002, with hydraulic testing of the French drain performed in October 2002, and a report of findings finalized in January 2003. The U.S. EPA was notified of Morton's intent to pursue this course of action, invited to be present on site for testing, and copied on the work plan and report. In short, we believe the necessary activities are already in progress.

Morton proposes that further work to evaluate and optimize groundwater recovery be conducted as part of Interim or Corrective Measures, rather than as part of the Facility Investigation. Completion of the FI, therefore, would not depend on the completion of additional evaluation or modifications of the French drain.

Action:
The results of the French drain pumping test were submitted to U.S. EPA on January 15, 2003. Morton is currently awaiting comments from the U.S. EPA on this work.

II. SPECIFIC COMMENTS

Section 2.4.2.1 The Pristine Superfund Site, page 7

1. The FI Report states that a 1992 assessment by a U.S. EPA contractor identified elevated metals and semi-volatile organic compounds (SVOCs) in the surface soil at the northeast corner of the Morton Facility near the Pristine boundary. Furthermore, this assessment concluded that the results indicate that some of the contaminants in the surface soils at the Morton Facility could have originated from off site sources. However, a review of Figure 2-7 of the facility's Current Conditions Report (September 2000) indicates that there is a drainage ditch between the Morton Facility and the Pristine site. This drainage ditch would appear to preclude the transport via surface runoff of contaminants on the Pristine site to the Morton site. Thus, to support the statement that surface soil contamination could be from off site sources, the FI Report should include a detailed description of the transport mechanisms which would explain the contaminants' presence in the surficial soils near the Pristine boundary. To further support the above statement, the FI Report should discuss the presence or absence of potential sources of on-site contamination based on information regarding industrial processes associated with each building from the Morton Facility.

Response:
The revised FI Report will include a more detailed discussion of the role of Pristine as a potential source of on-site contaminants, including a discussion of pertinent transport mechanisms. Please refer to the response to General Comment 2 for a related discussion on off-site sources and transport mechanisms.

As U.S. EPA noted in the comment, the suspected link between the Pristine Site and the metals and SVOCs in shallow soils in the northeast portion of the Morton Facility was first identified and reported by a previous U.S. EPA contractor (PRC, 1993). Morton does concur with PRC's conclusion, and does not believe it likely that the current ditch would preclude surface flow across this part of the property boundary. Our reasons are as follows:

- **The ditch lies on the Pristine side of the property, which has been extensively regraded during the course of remedial actions at that site. The current presence of the ditch does not indicate that such a ditch was present 20 to 25 years ago when Pristine was actively managing wastes. It is more likely that the ditch was constructed as part of drainage improvements following the soil removal response actions and remedial construction of the 1990's.**
- **Between Morton and Pristine, the ditch is a relatively low-profile, shallow feature (typically less than 1 to 2 feet deep). Assuming it was present during Pristine**

operations, it would have been relatively easy to overwhelm a drainage feature of this size, either with any of the larger releases documented to have occurred at Pristine, or with a large storm event. In short, it would not be a significant barrier to overland flow, even if it existed prior to response actions and remediation.

- **Records from the Pristine site document the presence of waste drums (8000 to 10,000) and other containers densely stacked across the entire site including the area immediately adjacent to the common fence line. Under such circumstances, the ditch would be of little utility in protecting the Morton property.**
- **Many of the large releases documented at Pristine were airborne in nature, which would not be contained by a ditch, and could potentially affect shallow soils across the entire Morton site. The same would be true for subsurface migration along perched zone or via capillary spreading.**

Action:
Sections 2.2 and 2.4.2.1 of the FI Report will be revised to reflect the information provided in this response.

Section 5.1.1 Upper Aquifer, page 44

2. When discussing the response to water levels in the Upper Aquifer (UA) during the termination and restart of the Pristine pumping system, the FI Report (p. 44) indicates that the referenced water level response data is provided in Appendix C. However, Appendix C does not contain the referenced water level data. In addition, when identifying the three Shallow UA sand wells monitored during termination of the Pristine pumping system, the FI Report (p. 44) identified well UAW17-20. No such well appears to exist; the correct well appears to be UAW17-40. The FI Report should be revised to include plots of the water level data recorded during the termination and restart of the Pristine pumping system and to correctly identify all monitored wells during the test.

Response:
The referenced water level data was erroneously omitted in the FI Report. During the January 23, 2003 meeting, it was discovered that the graph for UAW19-80, provided to U.S. EPA in the Third Quarter (July - September 2001) Progress Report for Facility Investigation, was inverted. One graph showing the response from all the wells will be provided with the revised FI Report.

The FI Report will be revised to correct the typographical error and correctly reference well UAW17-40.

Action:
The FI Report will be revised to include the water level data in Appendix C and to correct the typographical error on page 44. The water level data will include a single graph showing the responses of all nine transducers.

3. When discussing the response of the water levels in the three Shallow UA sand wells during the termination and restart of the Pristine pumping system, the FI Report (p. 14) indicates that "unlike the Deeper Upper Aquifer wells nearby, water levels in these shallow wells did not exhibit any clear response to the pumping system." These data are used to support the conclusion that "the Shallow UA Sand appears to be generally isolated hydraulically from both Deeper Upper Aquifer Sands and the Lower Aquifer." However, inspection of the data plots presented in the Third Quarter (July - September 2001) Progress Report for Facility Investigation for the response to the UA wells indicates that while they may be significantly damped and/or delayed relative to those observed in deeper UA wells, responses may have been observed in the UA wells. The plots of the water levels in these wells indicate a general increase in water level consistent with the increases observed in the deeper wells.

   No analysis of the potential response in the UA wells to the ten-day cessation of pumping in the Pristine system has been presented. Given the intervening low permeability deposits and the significant downward gradient observed between the shallow and deeper UA sands, it appears reasonable to observe some lag and damping of the responses observed between the shallow and deep sands. It is also unclear that the test period was of sufficient duration for the full response to develop in the upper sands. In addition, no indication was provided as to whether pumping from the upper aquifer extraction system at the Pristine site was simultaneously terminated with that from the deeper system. If this were so, some accounting of the impact of the shallow system may be necessary.

Response:
To clarify, according to discussions with representatives of Conestoga Rovers (CRA) who are responsible for the operation of the Pristine groundwater recovery system, there are two systems:

- **The 150 gpm system is comprised of 3 Lower Aquifer extraction wells (EW1, EW2, and EW3 located south of Morton) pumping at approximately 145 gpm and one well in the "upper outwash lens" (CRA's term for the shallowest Upper Aquifer sand at Pristine), which pumps at approximately 5 gpm.**
- **The 300 gpm system is comprised of 2 Lower Aquifer extraction wells (EW4 and EW5 located near the cemetery, south of the Morton Plant).**

During the 2001 maintenance shutdown, the 150 gpm system was turned off on June 3, 2001 at approximately 8:30 am and the 300 gpm system was turned off on the morning of June 6, 2001. Both systems were started again the morning of June 14, 2001.

The discussion of the transducer monitoring in the revised FI Report will be modified to include the above information.

Morton does concur that the three Shallow Upper Aquifer Sand (Shallow UA Sand) monitoring wells showed very gradual increases in water level over the monitoring period (0.3 to 0.4 feet rise over 25 days). These increases could either be interpreted to be an effect of the Pristine shutoff, or to be normal changes in water level, typical for a shallow aquifer strongly affected by surficial recharge.

We believe, however, that the data from these three wells is not consistent with a Pristine cause. For one of the Shallow UA Sand wells (UAW13-20), the water level rise had actually started prior to the Pristine shutoff. Water levels in another well (UAW09-20) actually fell slightly for three to four days after Pristine was shut down. The level in the third well (UAW17-40) fell, then rose, then fell again during the shut down period.

Unlike the Deep UA Sand wells, none of the wells showed any decline during the two weeks following the Pristine restart. We recognize that hydraulic responses can be damped when two zones are not in close communication. If such damping or delays are occurring however, they should affect both drawdown and recovery responses in a similar manner. In other words, we would expect that a response from the restart of Pristine pumping would be damped or delayed by roughly the same time period as the response from the termination of pumping. Hypothetically, therefore, if shutdown had caused an initial response in the shallow wells after approximately 4 to 5 days, then the response from the pumping restart should certainly have been evident within 10 to 12 days. No response to the resumption of pumping was observed in any of the three Shallow UA sand wells (UAW 09-20, UAW 13-20, and UAW 17-40) over the approximately 12 days following the Pristine restart. Its absence during a significantly longer period supports the conclusion that the Shallow UA Sand wells are not exhibiting any clear response to Pristine pumping.

The revised FI Report will clarify the basis for the conclusions reached on communication between the Shallow UA Sand and Deep UA Sands, and the discussion of transducer results will be expanded to incorporate the information provided above.

> These tests, by themselves, do not appear sufficient to conclude that the Shallow UA sand appears to be generally isolated hydraulically from both Deeper UA sands and the Lower Aquifer.

Response:
Morton understands that U.S. EPA's position is that the transducer data does not <u>independently</u> support a conclusion of no communication between the Shallow UA Sand and Deep UA Sands.

Morton would clarify that the conclusion reached on this issue, and documented in the FI Report, did not rely on the transducer data alone, but on a number of lines of evidence. These include the differential in water levels and the differences in chemical impact between the two zones. The water levels typically differ by about 15 feet between the Shallow and Deeper UA sands (see Section 5.1.1 and Figures 5-1 and 5-2 of the FI Report), suggesting a strong hydraulic separation between these aquifers. With the single exception of UAW15-50, the chemical data collected from the Shallow and Deeper Aquifer sands are also typically distinct. UAW15-50 is the only well out of 12 Deep UA wells where direct communication between the two sands is suspected to be occurring, based on hydrogeologic and chemical evidence compiled from the FI. UAW15-50 is discussed more completely below.

> In fact, as acknowledged elsewhere in the FI Report (p. 47), the Shallow and Deep UA sands do not appear hydraulically isolated based on chemical evidence.

Response:
Morton does acknowledge, as stated in the FI Report, that a point of communication may exist between the sand screened at UAW15-50 and the Shallow UA Sand. The presence of this communication is currently suspected, but has not been confirmed.

Even if some communication does exist with the UAW15-50 sand, existing data does not suggest that the connection with the shallower sand is strong. Otherwise, one would expect water levels in UAW15-50 to more closely approach those in the Shallow UA Sand in the north-central portion of the plant, where the connection is expected. The large difference in water levels suggests that the transmissivity of the UAW15-50 sand may be very low.

Please note that the conclusions stated in the FI Report considered the possible connection at UAW15-50. Even accounting for this single instance of possible communication, the water level and chemical data indicates that the Shallow UA Sand and Deep UA Sands are <u>generally</u> isolated, as stated in the FI Report. A single possible exception does not, in our view, invalidate this general statement.

Action:
Section 4.10 of the revised FI Report will provide more detail regarding the shutdown of the Pristine groundwater recovery systems. Section 5.1 of the revised FI Report will include more detailed discussions of the transducer monitoring results. Section 5.1 will also include a more detailed discussion of the multiple lines of evidence relied upon to reach any conclusions regarding the degree of communication between the Shallow UA Sand and Deep UA Sands.

Section 5.3 Chemical Impact to Environmental Media, pages 54, 55, 56, and 57

Shallow UA Sand

4. When discussing the highest level of constituents that may be derived from historical releases at the Morton Facility, the FI Report (p. 54) indicates that "most of these constituents, with the possible exception of ketones and certain inorganics, are not present at concentrations consistent with recent release or highly concentrated localized source areas (i.e., "hot spots")." However, examination of the groundwater quality data for VOCs on Figure 5-17 appears to indicate otherwise.

   At monitoring well UAW04-20, a toluene concentration of 21,000 μg/l was measured in the Shallow UA sands on May 7, 2001. Such levels of toluene appear consistent with a highly concentrated localized source. In fact, the nature, extent, and potential source of this significant toluene contamination does not appear to have been adequately identified.

Response:
Notes: This response is also applicable to Specific Comments 5 and 11.

In part based on data obtained since submittal of the FI report, it appears unlikely that the toluene detection in UAW04-20 is consistent with a highly concentrated localized source. First, the highest toluene concentration observed at UAW04-20 is less than 10 percent of solubility for that compound [524,000 μg/l at 25 °C, according to Groundwater Chemicals Desk Reference, 2nd Edition, page 969 (Banerjee, 1984)]. Second, concentrations have been substantially declining since the referenced concentration was observed, dropping to 8800 μg/l in the next sampling event, and 320 μg/l in the October 2002 sampling (January 2003 Progress Report for FI). If UAW04-20 was proximal to a source (i.e., toluene or hydrocarbon mixture, non-aqueous phase liquid, or NAPL), concentrations would be both significantly higher and more stable than those observed.

With respect to delineation of the observed toluene, concentrations are less than 5 μg/l in the neighboring well immediately downgradient of the French drain (UAW03-20). This would provide for downgradient delineation. Concentrations of toluene are non-detect in the two cross-gradient wells (UAW02-20 and UAW06-20). No evidence of free phase or staining was observed in the upgradient boring STR08 (which was continuously sampled).

As discussed in the meeting with the U.S. EPA on January 23, 2003, Morton believes the most likely source of the observed toluene is the combined sewer system (CSS). If this is correct, then toluene should not persist after planned upgrades to the CSS are implemented. If toluene continues to be observed in groundwater monitoring after CSS upgrades, Morton commits to perform additional investigation to identify and mitigate the source.

While low levels of chlorobenzene are found throughout the site, significant levels of this

constituent has been identified in the northwest corner of the site in monitoring well MW-EPA-1. Chlorobenzene levels as high as 3,200 µg/l have been reported in MW-EPA-1. Similarly, toluene levels as high as 1,400 µg/l have been reported for the nearby well UAW08-20. These groundwater concentrations could reasonably be classified as hot spots, consistent with a localized, nearby source. However, such a source has not been identified in the text of the FI Report.

Response:
As explained in the above response, these groundwater concentrations are not, per se, indicative of a hot spot. The solubilities of toluene and chlorobenzene in water are 524,000 µg/l and 502,000 µg/l, respectively [(Groundwater Chemicals Desk Reference, 2nd Edition, pages 969 and 211 (Banerjee, 1984)]. The concentrations referenced in this comment represent levels at a very small percentage of the compounds' solubility (0.2 percent for toluene and 0.6 percent for chlorobenzene) and are not laterally persistent. To date, there has been no evidence of a separate organic phase during groundwater sampling at these wells. It is our conclusion, therefore, that this is not suggestive of a "highly concentrated localized source."

Rather, the most likely source of the observed toluene in UAW08-20 is intermittent leakage from the combined sewer system (CSS). If this is correct, then toluene should not persist after planned upgrades to the CSS are implemented. If toluene continues to be observed in groundwater monitoring after CSS upgrades, Morton commits to perform additional investigation to identify and mitigate the source.

Action:
Modify Section 5.3 of the revised FI Report to clarify the intended meaning of "hot spot". This section of the revised report will also be modified to discuss the referenced detections in greater detail, including a discussion of their likely source.

5. The FI Report (p. 55) indicates that "the extent of groundwater impact in the Shallow UA Sand has generally been delineated by the FI Sampling." However, the localized areas of toluene contamination at UAW08-20 and, particularly, at UAW04-20 have not been well delineated; nor have source areas for these contaminants been identified. Similarly, the localized area of high chlorobenzene contamination at MW-EPA-1 has not been well delineated; nor has the source area for this release been identified.

Response:
Please see response to Specific Comment 4, above.

Moreover, it is not clear that the impact on shallow groundwater by potential releases from the combined sewer has been fully characterized. As indicated on Figure 5-25, the sewer survey has identified multiple points of likely release from the sewer which extends throughout the

facility. A detailed discussion demonstrating how the potential impact on groundwater from each of these potential release points has been identified and delineated should be provided. Morton shall address any identified data gaps.

Response:
Note: This response is also applicable to Specific Comment 12.

The assessment of the Combined Sewer System (CSS) was consistent with the approach specified in Morton's correspondence to the U.S. EPA dated July 11, 2001 and October 26, 2001. Since the submittal of the FI Report, however, the Morton Facility has completed a video survey of all sewer lines and plans for development of a capital project to address the CSS are underway.

Morton believes that the impact has been characterized adequately to meet the basic objectives of the FI, to allow effective risk assessment, and to support the selection and implementation of appropriate Corrective Measures. Specifically, the FI does support a conclusion that there are leaks in the northern portion of the system. An investigative approach attempting to trace specific detections to discrete sewer leaks would require an immense commitment of resources, without significantly advancing the knowledge base needed for future decisions.

With respect to characterizing impact suspected to originate from CSS leaks, the FI has delineated both the overall extent of groundwater impact from these suspected leaks, and the overall character of impact internal to the CSS. This information is certainly adequate to characterize risks posed by this impact, the effectiveness of groundwater recovery in controlling it, and to answer other pertinent and applicable questions.

As the repairs to the CSS proceed, Morton anticipates it will be necessary to collect additional soil data, particularly at locations where excavation will occur. This information would be required in order to adequately protect Morton and contractor workers from potential chemical hazards, but should also expand the available body of data for source characterization and risk assessment.

We suspect that the CSS is currently leaking, and is the likely source of most or all of the elevated organic detections in groundwater discussed in other specific comments. We believe that the planned improvements to the CSS should mitigate any leaks. The discussion of the CSS findings in the revised FI report will clarify this issue.

Action:
Morton will revise Sections 5.3, 5.6.5, and 7.0 of the FI Report to reflect the information provided in this response. Morton will provide U.S. EPA with future information generated during the replacement of the CSS.

Deep UA Sand

6. When discussing potential contaminant migration patterns in the Deep UA sands, the FI Report (p. 56) indicates that "assuming groundwater flow within these zones is predominately to the south along the natural regional gradients for the lower aquifer, then wells along the southern fenceline would be downgradient of potential on-site source areas." However, the groundwater gradient maps presented in Figures 5-1 and 5-2 indicate that flow in the Deep UA sands is either west to east or east to west depending on the location within the sand. While the water level data may suggest that groundwater migrates to the center of the facility and then southward, this interpretation is not clearly established by the water level data. Moreover, water level data have been taken from a variety of depths within the Deep UA sands, and due to the strong vertical gradients observed in the Upper Aquifer, these water level data may not provide an adequate basis for determining flow directions with the Deep UA sands.

Response:
Note: This response is also applicable to Specific Comment 11.

Morton acknowledges that the Deep UA Sands are more complex hydrogeologically than the Shallow UA Sand, consisting as they do of a series of laterally and vertically distributed lenses and layers. Given that, it would be difficult (and not necessarily useful) to fully characterize the exact hydraulic nature of each lens or layer.

Morton believes, however, that the data does provide an adequate basis for interpreting general groundwater flow within the Deep UA Sands. The U.S. EPA is correct that water level data was taken from a variety of depths within the Deep UA Sands. This is unavoidable, since these sands do not exist as a single layer, but as a series of typically thin and often laterally discontinuous layers, occurring at different depths. In short, water levels were measured from the depths where the sands existed, and these data are what is available as a basis for drawing conclusions. Water levels are generally consistent within these various sands, however, suggesting a large degree of hydraulic communication. This is consistent with hydrogeologic data from the FI (see Hydrogeologic Cross Sections, Figures 5-4 through 5-12 of the FI Report).

In addition, the U.S. EPA comment mentions "strong vertical gradients" within the Upper Aquifer. We would clarify that a strong vertical gradient does exist <u>between</u> the Shallow UA Sand and the Deep UA Sands, which are both part of the Upper Aquifer, as evidenced by variations in water level elevations of up to 15 feet at well clusters. The data do <u>not</u>, however, suggest that strong vertical gradients are present within the Deep UA Sands, or between the Deep UA Sands and the Lower Aquifer, where water level elevations typically vary less than a foot.

We would concur with the U.S. EPA that the data suggests that the predominant direction of groundwater flow in the Deep UA Sands is toward the central portion of the site. We believe that the data also indicates a slight southward gradient. This would be consistent with locally

observed flow directions in these sands (USGS, 2002). As discussed on January 23, 2003, however, we agree that some groundwater in the Deep UA Sands may be moving downward to the Lower Aquifer, at least in the central area of the Morton Facility where the Deep UA Sands and the Lower Aquifer appear to be in communication.

In short, Morton would clarify their interpretation of Deep UA Sands groundwater flow as follows:

- **To the extent that groundwater is migrating off-site laterally within the Deep UA Sands, we believe it is doing so toward the south, i.e., across the southern facility boundary.**
- **Some portion of Deep UA Sands groundwater may be migrating downward to the Lower Aquifer, via pathways where Deep UA Sands are continuous with the sands of the Lower Aquifer (see Hydrogeologic Cross Sections, Figures 5-4 through 5-12 of the FI Report).**

Morton will clarify this subject in the revised RI Report. As discussed in the January 23 meeting, and based on the above, Morton acknowledges that it is appropriate to continue to monitor groundwater quality in the Deep UA Sands. This monitoring would focus on, but not necessarily be limited to, the southern portion of the property, and the area where direct pathways may be present between the Deep UA Sands and the Lower Aquifer.

> Since a strong hydraulic connection between the Deep UA sands and Lower Aquifer has been established, flow directions in the Deep UA sands are likely to be heavily influenced by the north-south line of extraction wells installed to control the Pristine contaminant plume. Thus, it may not be appropriate to consider the monitoring wells along the southern boundary as downgradient from the source areas on the Morton site. Rather, given the apparent easterly migration of contaminants from the northwest and west central area of the site toward the area of UAW15-50, it would appear that monitoring locations in the eastern portion of the site would provide a better indication of the downgradient impacts in the Deep UA sands.

Response:
As Geomatrix has shown on Figures 5-1 and 5-2 of the FI Report, the data would support the U.S. EPA's hypothesis only in the northeastern corner of the site near Pristine, where the gradient within the Deep UA Sands tends to slope gently toward EW-1 extraction well on the Pristine site. As stated within the FI Report (page 46): "the gradient within these sands is probably affected by the Pristine groundwater recovery system."

This does not mean that all groundwater in these sands will flow directly toward these wells, however; such an interpretation does not account for the physical distribution or geometry of the Deep UA Sands and the Lower Aquifer (see Hydrogeologic Cross Sections, Figures 5-4 through 5-12 from FI Report). If groundwater is flowing from the Upper Aquifer to the Lower

Aquifer at the Morton Facility, it is likely that groundwater in these sands will flow toward the areas where the connection between the Deep UA Sands and Lower Aquifer is best. The available data suggests this interpretation for the central and northeast portions of the site. Except for the northeast corner of the site, near Pristine, we do not see any evidence to support the postulate that eastern wells would provide better downgradient control in these sands.

Although UAW15-50 must be considered in the development of any monitoring or Corrective Measures, it would not be technically valid to utilize this well to characterize the entire Deep UA Sands complex. Conditions at this well appear to be exceptional or anomalous. In addition, the sand monitored by UAW15-50 extends generally north-south, not east-west.

Action:
Section 5.2 of the revised FI Report will include the information provided in the above response. Morton will commit to monitor the Deep UA Sands.

Lower Aquifer

7. The FI Report (p. 57) indicates that to resolve U.S. EPA concerns regarding the potential impact of contaminant releases from the Morton site on the Lower Aquifer, multiple Lower Aquifer wells were installed in the northwestern portion of the Morton Facility. This area was selected for several reasons, including because it was the area of the former impoundments where significant amounts of water were managed and because it is an area where the Lower Aquifer is shallower than in any other portions of the Morton Facility. No impact was observed in these additional wells. Based on these results, it has been concluded that there are no impacts on the Lower Aquifer from historical or current Morton Facility operations.

   However, additional data collected during the FI strongly suggest that historical or current Morton Facility operations may be impacting the Lower Aquifer. The FI Report (p. 56) has acknowledged the potential impact from contamination in the Shallow UA sands in the west-central and northwest portions of the Morton Facility on the Deep UA sands at UAW15-50. The response of water levels in UAW15-50 to the termination and restart of pumping from the Pristine extraction system demonstrated a strong hydraulic connection between the Deep UA sands at UAW15-20 and the Lower Aquifer. Consequently, given the gradients created by the Pristine extraction system, it must be concluded that it is likely that the contaminants migrating to the Deep UA sands at UAW15-50 from the west-central and northwest portions of the Morton Facility are migrating further into the Lower Aquifer. The monitoring wells installed into the Lower Aquifer in the northwest portion of the facility are not positioned to detect these potential releases to the Lower Aquifer. Monitoring wells located in the eastern portions of the facility would be required for this purpose. It appears that additional monitoring in these areas may be necessary to confirm that historical or current Morton Facility operations are not impacting the Lower Aquifer.

Response:
The Lower Aquifer evaluation performed during the FI was based on concurrence between the U.S. EPA and Morton that the northwest portion of the plant was the most likely location for significant impact to reach the Lower Aquifer from Morton Facility sources. The Lower Aquifer is only 50 feet deep at this location, and the facility historically performed its most intensive liquid waste management there (i.e., the surface impoundments). Morton continues to believe that this is the most likely location for any Lower Aquifer impact by historical Morton Facility operations. No such impact to the Lower Aquifer has been identified by the Lower Aquifer study in the FI.

As noted in the January 23, 2003 meeting, the U.S. EPA has expressed concern that contaminants in the Deep UA Sands have the potential to migrate to the Lower Aquifer. Given the hydrogeology of the site, we would concur that this potential does exist. We would note, however, that the vast majority of impact to Deep UA Sands groundwater appears to be derived from Pristine, as opposed to on-site sources. Despite this, we agree that further monitoring should include the Deep UA Sands, particularly in areas believed to be likely pathways to the Lower Aquifer.

We would concur that, as stated in the FI Report, the impact observed in UAW15-50 is likely to have originated in the Shallow UA Sands, and may have been derived from an on-site source. There is no indication, however, that impact within this sand is, in fact, reaching the Lower Aquifer in detectable concentrations. As noted above, on-going monitoring should include the area between UAW15-50 and the identified pathways with the Lower Aquifer.

Action:
Sections 5.1 and 5.3.2 of the FI will be revised to include the information provided in the above response. The existing monitoring well network will be evaluated for its effectiveness in monitoring potential pathways from the Upper Aquifer to the Lower Aquifer. If necessary based on this evaluation, additional wells will be installed and monitored.

Section 5.3.1 Soils, page 50

8. Several shallow soil samples (UAW14-10-1.5' and UAW17-40-1.5') were collected near Buildings 12, 19, 26, and 27 during the FI. The Current Conditions Report (September 2000) indicates that limited soil removal in this same general area was completed between 1976 and 1978 due to leaking aqueous tin chloride transfer piping, drum storage, line washing operations, and spills. The Current Conditions Report also indicates that the soil was replaced.

   The FI Report should include a description of the areas where soil was removed and replaced near Buildings 12, 19, 26, and 27 and how these areas may or may not correlate with the locations of UAW14-10-1.5' and UAW17-40-1.5'.

Response:
All information on the releases of tin-bearing liquids to soil in the area of Buildings 12, 19, 26, and 27, and on subsequent soil removal, was derived from a single 1979 Memorandum prepared by Cincinnati Milacron. This memorandum has been attached for the U.S. EPA's reference. The memorandum generally describes the sources of releases, as documented in the Current Conditions Report, and summarizes the results of surface soil sampling, both before and after soil removal and replacement. Although the soil replacement activities appear to have substantially reduced tin levels in surface soils, some areas of elevated tin (up to 500 mg/kg) apparently remained in surface soils after these activities. Sampling results also indicate that tin did not tend to migrate deeper into the soil column, but tended to accumulate in the upper 6 inches of soil.

Based on the maps and sample locations attached to this memorandum, it is likely that UAW17-40-1.5' was proximal to or within an area affected by the tin releases, and possibly by the soil replacement. UAW14-10-1.5', however, appears to be outside the area affected by tin releases. Consistent with the U.S. EPA approved FI Work Plan, neither of these samples was analyzed for tin.

Action:
A copy of the 1979 Memorandum will be provided in the FI Report. The discussion in 5.3.1 will be expanded to include the information provided in the above response. Morton will collect additional shallow soil samples in the southeast and northwest areas of the plant, to evaluate levels of tin and chloride.

9. The analytical results of the soil sampling are presented on Figures 5-13 through 5-16 and on the summary Tables 5-2 through 5-5. Table 4-2 provides a list of all soil samples and the target analyte lists for which these samples were analyzed. However, inspection of Tables 5-2 through 5-5 indicate that the results for all of the analytes identified on Table 4-2 are not presented on Tables 5-2 through 5-5. For example, Table 4-2 indicates that soil samples were take for Appendix IX analysis at Direct Push locations DP-31, DP-36, DP-37, DP-38. However, no analytical results for these locations have been presented on Tables 5-2 through 5-5. Data for these locations are similarly not provided on Figures F-13 through 5-16. No data set other than these tables and figures have been provided in the FI Report, including in the Appendices. Concentrations for all detected constituents should be provided on the summary table. A complete data set should be provided in the Appendices or in an attached CD.

Response:
The analytical data for DP-31, DP-36, DP-37, and DP-38 were inadvertently omitted from the data summary tables and figures. Morton has submitted a CD-ROM with the FI Report, containing a complete set of analytical data from the FI. The omitted analytical results will be added to the appropriate tables and figures in the revised FI Report.

Action:
FI Report Tables 5-2, 5-3, 5-4, and 5-5 will be revised with to include the analytical results for DP-31, DP-36, DP-37, and DP-38.

10. The first paragraph on page 50 states "....many of the observed constituents may have originated from off-site sources (see Section 2.3.2)." However, the FI Report does not provide a description of the transport mechanisms which would explain the contaminants' presence in the surficial soils and soils within the vadose zone beneath the facility.

    The FI Report should include a detailed discussion of the transport mechanisms which would explain the contaminants' presence in the shallow soils of the site and support the statement that many of the observed constituents may have originated from off-site sources. To further support the above, the FI Report should discuss the presence or absence of potential sources of on-site contamination based on information regarding industrial processes associated with each building from the Morton Facility.

Response:
As stated in the response to General Comment 2, transport mechanisms could include airborne particulates and aerosols, overland flow of spills, runoff transporting contaminant particles or contaminated soils, and subsurface flow both in the unsaturated zone and at the capillary fringe. We would refer the U.S. EPA to the discussion of off-site sources in the CCR, to available records on Pristine activities and releases.

Section 3.0 of the Current Conditions Report provides a discussion of potential sources of on-site contamination. The comment further suggests a building-by-building discussion of all industrial processes at the Morton Facility. We would respectfully reiterate the position described in the Response to General Comment 2, above, that such an analysis is neither practicable nor especially pertinent to current interpretive efforts. Morton is <u>not</u> using the presence or absence of a chemical in site operations to characterize that chemical as being derived from an on-site vs. off-site source. Instead, we are relying on the more pertinent information derived from FI activities to date, including:

- **Absence or near absence in the Shallow UA Sand groundwater, with presence predominantly in deeper groundwater.**
- **Distribution in shallow groundwater reflecting highest concentrations near the Pristine Superfund Site, with generally declining concentrations moving east and south across the site.**
- **Occurrence in on-site soils primarily in the immediate vicinity of the Pristine Superfund site.**
- **Presence in on-site soils only at very low concentrations, and occurrence either in only a few scattered samples or widely distributed across the site primarily in shallow soils.**

Occurrence only within a localized group of samples would not meet this criterion, and would be considered suggestive of an on-site potential source.

Morton has only concluded that a compound or group of compounds is derived from off-site sources if both the historical and physical evidence is most consistent with that interpretation. Specifically, this conclusion has only been reached when the physical distribution of a compound is consistent with an off-site source, and there is a known off-site source for that compound. Morton believes that this approach is more appropriate for supporting these conclusions rather than a reliance on historical records of chemical use or waste generation.

Action:
Sections 2.4.2 and 5.3.1 will be revised to include the information provided in the above response.

11. The areas of note that were identified in the text of Section 5.3.1 of the FI Report did not include the high toluene concentrations (160 mg/kg) detected in sample UAW04-20-10'. Groundwater samples at this location also indicate significant groundwater contamination. The full nature and extent of the toluene contamination in this area has not been well determined.

Response:
As discussed in the response to Specific Comments 4 and 6 above, we would not consider the groundwater levels of toluene at this location to be exceptional, or to be indicative of proximity to a source area. The soil concentrations referenced are also not suggestive of a source area—the presence of residual toluene or petroleum hydrocarbon NAPL at the location of a release would likely result when concentrations are well in excess of 1000 mg/kg.

As discussed in the January 23, 2003 meeting, the U.S. EPA does not consider the current data on toluene in this area to be adequate to support risk assessment. With respect to the soil data, Morton will commit to perform one of the following:

- **Additional assessment of toluene in the area of UAW04-20, if a risk-based approach is to be used at this location, or**
- **Direct remediation of the soils at this location, with supporting confirmation sampling.**

The areas of note that were identified in Section 5.3.1 also did not include the area surrounding monitoring well UAW17-40. Monitoring well UAW17-40 was installed near the southeast corner of the facility property near Buildings 26 and 27. During the installation of the well, shallow soil samples (UAW17-40-1.5' and UAW17-40-5') were collected and analyzed for VOCs, SVOCs, PCBs/pesticides, and metals. Results of these analyses indicate elevated concentrations of VOCs, SVOCs, PCBs/pesticides, and metals (particularly lead). However, the FI Report does not address these results.

The FI Report should provide a detailed discussion of the contaminants detected in the shallow soil during the installation of UAW17-40. The discussion should include a description of the source of this contamination, the mechanism for its transport (if it is believed to have originated off site), and the horizontal and vertical extent of contamination should be delineated.

Response:
Morton concurs that the referenced sample contains low levels of several organic and inorganic constituents. Most of these constituents, however, are present at very low concentrations. Morton believes that only the lead detection at 5' (128 mg/kg) is sufficiently elevated to merit further consideration. Note that elevated lead was not observed in shallow groundwater at this location, suggesting that the lead observed in soils is not likely to be extensive or especially mobile. The revised FI Report will discuss all detections at this location in greater detail, focusing on the lead.

Action:
Section 5.3.1 of the revised FI Report will be expanded to include a more detailed discussion of the soil analytical results at the UAW17-40 location.

Morton will perform further soil sampling at the UAW17-40 area. The objective of this sampling would be to determine whether the lead detection from the five-foot soil sample at UAW17-40 is a localized anomaly or more extensive.

12. The FI Report also fails to discuss the potential impact to soils resulting from leaks in the combined sewer system. As indicated on Figure 5-25, the sewer survey has identified multiple points of likely release areas or points from the sewer which extends throughout the facility. A detailed discussion demonstrating how the potential impact on soils from each of these potential release points has been identified and delineated should be provided.

Response:
Please refer to the response to Specific Comment 5 above.

<u>The Former Surface Impoundments (SWMU 1)</u>

13. The FI Report acknowledges that contamination likely attributable to the facility was identified at the former surface impoundments. However, the FI Report does not discuss the potential impact of the identified soil contamination or the adequacy of the available data for fully characterizing releases at the impoundments. The soil data clearly indicate significantly elevated levels of toluene at the surface impoundments, with toluene levels as high as 150 mg/kg found in DP16-12.8. Toluene contamination in groundwater has been observed in nearby levels, including 1,400 ug/l of toluene in nearby monitoring well UAW08-20. These data appear to indicate potentially significant releases that may require remediation. However, each surface impoundment was

investigated using only a single direct push boring with two soil samples taken from each boring, one taken at the surface and a second at a depth of 10 to 12 feet. Given the data that potentially significant releases have occurred at the surface impoundments, the currently available data do not appear to characterize fully the soil contamination in the vicinity of the former surface impoundments sufficiently to define maximum contaminant levels, the full extent of contaminant, and to allow assessment of the potential risk posed by the releases.

Response:
The scope of soil sampling for each impoundment was described in some detail in the approved FI Work Plan, with the knowledge of all parties that the surface impoundments were very likely to contain detectable levels of contamination. All characterization work was performed in accordance with the approved FI Work Plan.

The rationale for the approach developed in the FI Work Plan was based on a number of factors:

- **The relatively small footprint of each of the individual surface impoundments. Approximately 40 by 60 feet is typical for the four smaller impoundments, with the two larger impoundments at approximately 70 feet square. This yields a total lagoon area of slightly more than ½ acre. These measurements are at water level, so the dimensions of the base of each lagoon, where sludges would tend to accumulate and releases would be most likely, would be considerably smaller.**
- **The fact that the bases of the impoundments were likely excavated to a depth approaching the Shallow UA Sand static water level. Given this, groundwater would tend to provide a more reliable indicator of releases.**
- **The fact that these ponds managed aqueous wastes, in which a large degree of homogenization would tend to normally occur.**
- **The fact that the impoundment system was operated in a sequence, with wastewater draining from one to another through all six impoundments.**

Given the final two points, the impoundment system should behave (from a potential source standpoint) as a single impoundment, with dimensions of approximately 250 feet by 60 to 120 feet. Geomatrix has placed six borings within this impoundment area, with another four sampled borings on the perimeter. Each of these borings was continuously sampled, and analytical samples were retained from the interval believed to be most impacted, based on field indications. For comparison purposes, the Soil Screening Guidance: User's Guide (U.S. EPA, 1996) recommends two to three borings per source area for screening purposes, in the areas of highest suspected subsurface concentrations. This approach characterizes the highest levels of contamination within a source area, providing for a conservative estimate of risk. The same U.S. EPA guidance recommends dividing an area of suspected contamination into exposure areas of no more than 0.5 acre and collecting six samples per exposure area for surface soil screening. We believe the FI approach for the soil sampling at the former surface

impoundments is consistent with this regulatory approach, and with typical investigation methods.

Based on the January 23, 2003 meeting, Morton will expand the discussion of soil and groundwater impact in the revised FI Report for the area of the Former Surface Impoundments. This discussion will specifically address any correlation between soil impact and depth or soil stratification. In addition, the discussion will clarify the basis for soil sample selection at any given location.

Action:
Section 5.6.1 of the revised FI Report will include the information provided in the above response.

The T-1 Area (Trench T-1)

14. The FI Report (pg. 50-51) acknowledges that "soils in the vicinity of these drums (found in drum disposal site in the T-1 Area) exhibited elevated levels of metals, particularly tin, arsenic, chromium and lead." These levels were as high as 580 mg/kg of arsenic, 232 mg/kg of chromium, and 19,300 mg/kg of lead. The FI Report (pg. 51) further states that "subsequent DPT sampling of the areas, in addition to sampling in other nearby trenches, has confirmed that elevated metals levels are confined to the immediate area of the former drum location." However, it does not appear that groundwater within or immediately downgradient from the T-1 area has been sampled. Consequently, it has not been determined if these high levels of metals contamination are impacting groundwater. Groundwater sampling in the area immediately downgradient from the T-1 area should be performed.

Response:
The location of Shallow Upper Aquifer monitoring well UAW06-20 is within 40 feet of the T-1 area and considered to be downgradient. Analytical results for three separate sampling events were provided in the FI Report. The concentrations of arsenic, lead, and chromium found in groundwater at this location are characteristic of groundwater represented by other monitoring wells along the western property boundary, and do not suggest the presence of anomalous metals impact at this location.

Morton concurs, however, that there is currently no data for groundwater at the T-1 location. Based on the January 23, 2003 meeting, the U.S. EPA has recommended the collection of a single grab groundwater sample (one event) at the T-1 location utilizing direct push or equivalent methods. Morton will collect a one-time additional groundwater sample at this location.

Action:
Morton will collect a one-time groundwater sample at the T-1 location utilizing direct push or equivalent methods.

COMMENTS FROM THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (U.S. EPA) ON THE JUNE 2002 BASELINE RISK ASSESSMENT

MORTON INTERNATIONAL, INC. (Morton)
READING, OHIO

Action: Morton intends to complete the additional work required by U.S. EPA to fill data gaps regarding the nature and extent of environmental impact. Because the Baseline Risk Assessment (BRA) depends upon the findings of the additional FI work, the BRA will not be revised and resubmitted after the revised FI Report is approved by the U.S. EPA.

I. GENERAL COMMENTS

1. In the June 2002 Morton International, Inc. Baseline Risk Assessment (BRA), the procedure to screen the list of detected compounds to select constituents of potential concern (COPCs) for evaluating the Human Health Risk Assessment (HHRA), does not follow recent guidance related to inclusion of naturally occurring and anthropogenic background contamination. Per U.S. EPA's 1989 Risk Assessment Guidance for Superfund (RAGS), the use of background data is acceptable for evaluating inorganic analytes only, but organic compounds cannot be screened out based on background concentrations. Additionally, as outlined in more recent U.S. EPA Superfund guidance, *Role of Background in CERCLA Cleanup Program* (OSWER 9285.6-07P, May 1, 2002), U.S. EPA has established a policy that the BRA retain constituents that exceed risk-based screening concentrations, regardless of whether or not those constituents are believed to be from background sources. This enables the risk manager to have a more complete picture of the risks associated with hazardous substances, pollutants and contaminants present at the site.

   At a minimum, Morton should discuss elevated background concentrations of COPCs and their specific contribution to site risks. In light of this new policy, all COPCs that were originally excluded from the BRA, on the basis that they are naturally occurring or believed to be anthropogenic background constituents, should be included in the risk assessment. This is particularly important for assessing cumulative risks. Regardless of the origin of contamination, the COPCs are contaminants available for exposure and will contribute to the overall cumulative risks at the site. Thus, they can not be neglected in a BRA.

   Additionally, in a January 23, 2002 meeting with Morton, U.S. EPA discussed and approved Morton's background sampling locations; however, there was no discussion or agreement on how these background data may be used. U.S. EPA requested that a letter summarizing the approach on the use of background data be submitted to U.S. EPA for review and comment

prior to preparation of the final report. It should be noted that this was never submitted to U.S. EPA; thus, this is the first time U.S. EPA is reviewing the use of background data.

Response:
Note: This response is also applicable to General Comments 2 and 3 and Specific Comments 6, 7, 8, 10, 11, 12, 14, 16, and 17.

The elimination of chemicals at the site as chemicals of potential concern (COPCs) based on a comparison to background samples was consistent with the FI Work Plan for the risk assessment. RAGS distinguishes between naturally-occurring background (typically inorganics) and anthropogenic background (inorganics and organics), and states that chemicals representing anthropogenic background can be considered at the end of the risk assessment or eliminated from the risk assessment, but cautions against elimination because of the difficulty in distinguishing site-specific and general area-wide anthropogenic sources.

The May 2002 U.S. EPA guidance was published concurrently with the finalization of the BRA, which did not allow the new guidance to be considered in the BRA. That guidance, however, does not prohibit the elimination of detected compounds in background samples from the quantitative risk assessment. The examples in the 2002 guidance (hypothetical cases 1, 2, and 3) suggest that chemicals can be eliminated from quantitative evaluation based on a background comparison as long as they are discussed qualitatively in the risk characterization. Further, this guidance allows for the exclusion of organic chemicals as COPCs (see hypothetical case 1), if the concentrations at the site are consistent with area-wide background concentrations.

In order to address U.S. EPA concerns that the Risk Manager has a complete understanding of overall site risks, the human health risk assessment (HHRA) portion of the revised BRA will include the requested quantitative discussion of compounds that are believed to represent background conditions, but that exceed screening levels.

Morton has complied with its obligations under the Section 3013 Administrative Order with regard to the Facility Investigation of impact from the identified Solid Waste Management Units (SWMUs). Morton is not, however, responsible for the assessment or remediation of impact from sources other than those at the Morton Facility.

2. The Screening Ecological Risk Assessment (SERA) also eliminates compounds that are below background. As discussed above, background data cannot be used to screen out COPCs in a SERA. Both the HHRA and SERA should be revised accordingly.

Response:
Note: This response is also applicable to General Comment 3 and Specific Comments 35 and 37.

Based on recent ecological risk assessment guidance, the SERA will be revised to quantitatively consider chemicals present in background samples. A more detailed rationale will be provided for elimination of chemicals from non-site-specific sources. Chemicals with hazard quotients (HQs) greater than 1.0 will be evaluated for contributions from background, which will be discussed qualitatively in the risk characterization section of the risk assessment.

For the ecological risk assessment, however, Morton reiterates that it is not responsible for assessing or remediating impact from sources other than the Morton Facility, as stated in the response to General Comment 1 above.

3. It is not appropriate to eliminate chemicals as COPCs if they are presumed not to be associated with Morton Facility releases. A BRA must consider all contaminants present at the site, regardless of their origin, because they will contribute to the overall cumulative risk at the site (also see General Comment 1). A discussion of those non-site related COPCs in the HHRA and SERA can be further examined as part of the Risk Characterization and Uncertainty Analysis regarding site risks. Per General Comment 1, all COPCs, anyway of origin, must be considered in the risk assessment.

Response:
Note: This response is also applicable to Specific Comments 6, 7, 8, 10, 11, 12, 14, 16 and 17.

As discussed in the responses to General Comments 1 and 2, above, Morton will consider all known contaminants in both the HHRA and SERA. At a minimum, the contribution of background contaminants to risk will be discussed in the Risk Characterization and Uncertainty Analysis of the HHRA and SERA.

4. Although the approved FI Work Plan (Morton, 2000) indicates that the federal maximum contaminant levels (MCLs) or the U.S. EPA Region 9 preliminary remediation goals (PRGs) for tap water if an MCL is not available, will be used to screen groundwater and surface water data to select COPCs, the MCLs are not entirely appropriate. Previous review comments on the FI

Work Plan (Morton, 2000) requested that Morton demonstrate the appropriateness of any PRGs and risk-based screening levels (RBSLs) used to identify COPCs in the HHRA. This information is missing from the BRA report. MCLs are more appropriately applied to select cleanup levels because it is not generally U.S. EPA's position that groundwater or surface water be remediated beyond MCLs unless more stringent levels are appropriate for ecosystem protection. Additionally, MCLs are not exclusively derived using risk-based criteria that consider multiple exposure pathways. While it would be acceptable to use the MCL to select a COPC when the MCL is more conservative than its corresponding risk-based screening level, the risk-based criterion must be used as the screening level when it is lower than the MCL. Thus, the U.S. EPA Region 9 PRG for tap water should be applied as the RBSL where it is more conservative than the MCL.

Response:
Note: This response is also applicable to Specific Comments 13, 15, and 18.

Since PRGs developed by EPA Region 9 and risk-based screening levels developed by Region 5 were used, it did not seem necessary to provide a discussion of procedures used to calculate these values. Text will be added to the BRA to indicate that the exposure pathways are the same as those evaluated for receptors at the Morton site. As confirmed in the January 14, 2003 conference call with Morton and U.S. EPA, the use of MCLs for screening is consistent with U.S. EPA guidance and policy. Based on that call, it is our understanding that this screening is considered acceptable to U.S. EPA, and no further action is required to address this comment.

5. It should be noted that the U.S. EPA Region 9 PRGs were updated in October 2002. This update is a major revision from the previous version, and contains several changes to the toxicity values. In addition, the updated PRG table was reviewed by the National Center for Environmental Assessment (NCEA) and is the only published source of the latest NCEA provisional toxicity values for certain constituents. Thus, Morton should use this updated version of the PRGs in the revised risk assessment to ensure that the latest toxicological information and screening values are applied.

Response:
Note: This response is also applicable to Specific Comment 18.

The updated October 2002 PRGs were issued several months after the submittal of the BRA in June 2002. Per our discussions with U.S. EPA, the revised BRA will incorporate the 2002 PRGs.

6. The BRA indicates that constituents detected in fewer than five percent of samples were excluded as COPCs on the basis that their infrequent detection makes them insignificant sources of exposure. However, the risk assessment does not address the potential for the existence of hot-spots (i.e., localized areas of high contamination). The BRA should evaluate whether there is any pattern to the infrequently detected constituents (e.g., whether or not they are generally co-located) and whether the infrequently detected constituents correspond to the location of high detections of other constituents that are included as COPCs.

Response:
Only seven chemicals in soil or groundwater were eliminated solely based on frequency of detection. The revised BRA will discuss the potential for "hot spots" of these chemicals. If a "hot spot" is considered likely based on FI data, the chemical will be considered in the revised BRA.

7. The BRA relies on the use of industrial soil screening criteria because the site is anticipated to be used for industrial purposes into the foreseeable future. U.S. EPA Region 5 policy outlined in *Use of Institutional Controls in the RCRA Corrective Action Program* (www.epa.gov/reg5rcra/ca) describes information that should be discussed in regard to land use determinations. Former review comments on the FI Work Plan (Morton, 2000) requested that this information be included in the HHRA. This information is missing from the BRA. Sources of information about current land use restrictions and future land use expectations should explicitly include a discussion of zoning laws and maps, consultation with local planning authorities, and assessment of property development trends in the vicinity of the facility. U.S. EPA has also specifically cautioned against automatically assuming restricted future land use assumptions on the basis of extrapolation of current land use and relying on current zoning/industrial use codes [55 Federal Register 19452; May 1, 1996]. The BRA should provide a more detailed discussion of the decision to assume industrial land use in screening for COPCs and to select only on-site industrial exposure scenarios and exposure pathways.

Response:
Prior to the completion of the BRA, the local planning department was contacted regarding potential future use of the property. This department indicated that future land use was anticipated to remain industrial. This information, along with local zoning maps and documentation of future land use activities will be added to the revised BRA. Information from Morton regarding their future land use plans will also be included. As part of the final remedy for the site, Morton anticipates that a deed restriction would be placed on the property to limit potential future use to commercial/industrial.

8. The BRA indicates (Section 4.1.2, page 17) that the Upper Aquifer is not known to be used as a source of potable water. The text also states that although the lower portion of the Lower

Aquifer is widely used as a source of potable water, there are no known active supply wells at or in the immediate vicinity of the Morton Facility. The BRA also indicates that the Lower Aquifer groundwater is being controlled by the remediation system for the neighboring Pristine Superfund site. Thus, Morton does not evaluate groundwater as a potable water source in the BRA.

It is noted that Morton does not have in place appropriate institutional controls to restrict current and future groundwater use on site. In addition, Morton does not have any control over groundwater use in off-site areas. It is also noted that any consideration of the remediation system for the neighboring Pristine Superfund site is to be included as a risk management activity, the impact of which should be assessed independent of, and following, a human health and ecological risk assessment. Therefore, Morton should revise the risk assessment to consider this exposure pathway and include the potential for groundwater to be used as a source of potable water.

Response:
Note: This response is also applicable to Specific Comments 19 and 20.

As discussed in the responses to comments to the FI Work Plan, development of appropriate institutional controls for groundwater can be accomplished during the remedial action phase of the project rather than incorporate a very unlikely pathway (ingestion of upper aquifer groundwater) into the BRA. In addition, based on groundwater flow direction in the Shallow Upper Aquifer Sand, which is where groundwater impact suspected to be derived from the Morton Facility is predominantly located, migration is generally toward the creek and not to off-site areas where groundwater could be used as a drinking water source. As noted in responses to comments on the FI Report, Morton is committed to performing monitoring in the deeper portions of the Upper Aquifer, including locations that could represent pathways for impact to potential drinking water sources.

To address the U.S. EPA concerns, the revised BRA will include area-specific information on the potential use of Upper Aquifer groundwater. If available, this will include any classification of the Upper Aquifer by the State of Ohio with regard to its use for water supply.

In addition, EPA indicated in their comments to the FI Work Plan that exposure via ingestion of groundwater could be eliminated (a) if site-related COPCs have not migrated into the Lower Aquifer or (b) if site-related COPCs have migrated to the Lower Aquifer, but migration of those constituents will not cause concentrations to exceed MCLs at drinking water supplies. Based on the results presented in the FI, site-related chemicals have not migrated to the Lower Aquifer. In order to address future risks, Morton has committed to monitor the potential pathways for Upper Aquifer groundwater to reach the Lower Aquifer.

9. With respect to chromium, the BRA assumes that all exposures reflect the less toxic trivalent form of chromium. None of the text discussion or the data summary tables indicate that chromium speciation was performed during the analyses of site samples. Without speciation information, it is common practice in risk assessment (and a more conservative assumption) to presume that chromium detections are present in the more toxic hexavalent form. The BRA should be revised to provide evidence that all chromium is present in the trivalent state, or the risk calculations should be re-run using hexavalent chromium chemical parameters and toxicity criteria.

Response:
Morton does not believe that hexavalent chromium is likely to have been released, given the nature of site operations. The trivalent form of chromium is more stable in the environment under ambient conditions; consequently, the chromium detected was assumed to be trivalent. Given this, an assumption that all of the chromium present is hexavalent would be unrealistic, and not pertinent to actual site risks.

The revised BRA will include a more detailed discussion regarding the potential forms of chromium present in site media, based on historical and geochemical information. If there appears to be any realistic potential for hexavalent chromium to be present in site media, then this potential will be considered in the revised BRA.

10. The SERA, Section 7 of the BRA, is not acceptable because it does not adequately follow current U.S. EPA ecological risk assessment guidance (i.e., EPA, 1997; EPA, 2001a, 2001b) and there are inconsistencies with the FI Work Plan (Morton, 2000). Key deficiencies include (1) some likely complete pathways are omitted; (2) contaminants of potential concern are inappropriately screened out because they are not detected, do not have screening values, or are below selected background concentrations; and (3) food chain risks to wildlife are not assessed.

Response:
Note: This response is also applicable to General Comment 11.

U.S. EPA's guidance document entitled *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments* was used in the preparation of the report. The reference was inadvertently excluded from the introductory section of the SERA. This guidance was extensively used in the determination of ecological receptors, pathways and screening ecotoxicological criteria.

The revised BRA will re-evaluate likely complete pathways, screening of compounds, and bioaccumulative risks in accordance with up-to-date U.S. EPA guidance. These guidance documents will be cited, as appropriate, and included in the list of references.

11. In general, the SERA cites older risk assessment guidance. As noted in the Specific Comments below, the SERA should cite and follow current U.S. EPA national ecological risk assessment guidelines.

Response:
Please refer to the response to General Comment 10.

II. SPECIFIC COMMENTS

Section 1.2 Approach, page 1

1. In addition to the guidance documents listed on page 2, Morton should also cite and follow U.S. EPA's current ecological risk assessment guidance documents, which are listed under "Literature Cited" attached at the end of these comments (EPA, 1997; 1998; 2001a; and 2001b). Two of these documents (EPA, 1997; 1998) are cited in the FI Work Plan (Morton, 2000; Section 6, p. 1) but are not included in the Approach Section of the SERA. Please include all appropriate risk assessment guidance.

Response:
The most current guidance will be considered and appropriately cited in the revised BRA.

Section 2.1 Site History, page 3

2. Page 4 lists some of the materials and chemicals used or produced on site, but a comprehensive list and description has not been provided. For example, Morton should elaborate on the components of the anti-stripping agents noted in the second bullet. Only a few volatile organic compounds (VOCs) are listed on page 4, which does not include some of the compounds noted to be groundwater and soil contaminants at the site (e.g., 13 soil VOCs are noted on p. 7). It is unclear whether site activities may have released polynuclear aromatic hydrocarbons (PAHs) through combustion processes or petroleum spills. It is also unclear if polychlorinated biphenyls (PCBs) may have been released. Page 8 shows that PCBs were detected in groundwater at 0.13 mg/L, which is near the solubility limit for Aroclor 1242 (0.24 mg/L; Eisler, 1986). Morton should provide a more complete description of compounds used, produced, and potentially released on site. This discussion should be consistent with the compounds actually detected in site media, and should note possible sources of contaminants (e.g., PCBs) that may not be explained by known site activities.

Response:
A more complete description of historical activities is provided in the Current Conditions Report (CCR) and Facility Investigation Report (FI Report). The narrative in the BRA was only intended to summarize key information from these documents.

Developing a comprehensive list of compounds used, produced and potentially released at the site for a 50-year old manufacturing facility is nearly impossible. Given this, historical or process knowledge was used primarily to guide the location of sampling, and not the selection of analytes, except where that knowledge was sufficient to rule out releases of general classes or groups of compounds (e.g., radionuclides). Instead, the environmental media sampled were initially analyzed for a broad range of parameters, consisting of modified Superfund or Appendix IX analyte lists. Certain analytical lists from the late activities of the FI were narrowed somewhat, based on the compounds detected and their observed distribution from the initial sampling.

The historical information in the Current Conditions Report was developed to provide guidance on where to sample and which chemicals to analyze. As a result, a comprehensive Target Analyte List was developed for the FI. It would be impossible to connect all detections to a particular historical source at the facility.

The revised BRA and FI Report will include more detailed discussions of the compounds detected in site media, including the likely source or sources of those compounds. With respect to the specific compounds or groups of compounds listed, please consider:

- **VOCs—We believe that the data indicates a likely off-site source for many of the VOCs observed at the site. In particular, the distribution of many of the chlorinated VOCs indicate their likely origin at the upgradient Pristine site, where large quantities of these compounds were released into soils and groundwater.**
- **PAHs—The widespread nature of PAHs at the site, and the low levels at which they are observed, is far more suggestive of a non-point source, such as airborne particulates or erosion of asphalt sealants, than a point-source release like a fuel spill. It is quite possible that airborne PAHs may have been produced by on-site combustion activities, since these compounds are a near-ubiquitous result of many combustion activities. We would note that there are several other potential sources for airborne PAHs in the immediate vicinity, including waste burning activities at the Pristine Site and Cincinnati drum facilities, an asphalt batch plant, and a rail line that all neighbor the Morton Facility. It is also not clear that airborne releases associated with permitted air emissions would fall within the scope of the Administrative Order.**
- **PCBs—Morton has not identified any documented release of PCBs at the site, although PCBs were one of the wastes managed and released at the upgradient Pristine Site. We would also note that the referenced Aroclor 1254 detection was anomalously high, compared to all other PCB detections in groundwater (all others**

below 1 μg/l). It was also not replicated in a duplicate sample from the same event (<100 μg/l), nor in a subsequent sampling event only a month later (<1 μg/l). PCBs were also not detected in soils sampled at this location. This suggests the referenced detection is questionable at best, and is not a sound basis for reaching conclusions about potential sources of impact, or required corrective measures.

Section 2.4.3 Surface Water/Seeps, page 9

3. Page 9 discusses contaminants measured in two seeps along the Mill Creek bank. It is unclear why data for only two seeps are provided, when the report indicates there are additional seeps. Groundwater contamination may be heterogeneous at the site (e.g., PCB contamination may be localized); thus, it is unclear if the contaminant data for only two seeps are adequate to describe releases to surface water. Morton should provide all available data on the seeps and provide justification for the data used in the HHRA and SERA. Additionally, seep discharges should be discussed in the SERA, including approximate locations and flows.

Response:
The FI Report discusses the sampling activities in detail. Only two small seeps were observed during the routine reconnaissances of the portion of Mill Creek bordering the Morton Facility, although a large extensive seep with clear evidence of environmental impact was observed immediately upstream of the facility. The revised BRA report will include an expanded discussion of the physical nature of the observed seeps along Mill Creek including estimates of seep rates. Location of seep samples was provided on Figure 4 of the BRA. Information on approximate flows will be included in the revised BRA. In addition, please see the response to Specific Comment 2 for a discussion addressing possible PCB releases at the Morton Facility.

Section 2.4.4 Sediment, page 9

4. Page 9 states that 20 sediment samples were analyzed for potential contaminants, but only one sample was analyzed for semivolatile organic compounds (SVOCs). SVOCs would be expected to accumulate in sediment to a greater degree than volatile constituents. This particular sample contains multiple PAHs that exceed screening values (e.g., Table 10.2). This section should include justification for only analyzing SVOCs at one location and why that specific location was selected. Morton shall address any identified data gaps.

Response:
All sediment and seep samples were analyzed for the parameters identified in the U.S. EPA approved Seep/Sediment – Target Analyte List (Seep/Sed-TAL). The Seep/Sed- TAL did include a subset of SVOCs, i.e., all 20 sediment samples were analyzed for selected SVOCs.

The laboratory, however, inadvertently analyzed one sediment sample for an expanded SVOC analyte list. Since the laboratory reported this information, Morton included the data in the FI Report.

Section 3.2 Selection of Chemicals of Potential Concern, page 11

5. Previous review comments on the FI Work Plan (Morton, 2000) required Morton to provide a discussion on procedures that are used to calculate PRGs or risk-based screening levels for those compounds that do not have sufficient toxicity data. There are several compounds for which surrogate risk-based screening levels adopted from other compounds are used for screening. The BRA does not include a discussion supporting the use of surrogate values adopted from other compounds. The BRA should be revised to include a discussion on the appropriateness of using these surrogate values for screening.

Response:
The use of surrogate RBSLs will be discussed in the revised BRA.

Section 3.2.1 Soil, page 12

6. Several organic constituents, including PAHs and pesticides, are excluded from the HHRA on the basis that they are not site-related, implying that unspecified off-site anthropogenic sources are responsible for certain constituents detected at the Morton Facility. Per the general comments provided herein, contaminants cannot be eliminated from a BRA on the basis that they are non-site related. Rather, they must be included in the quantitative risk assessment, but then may be qualitatively discussed in the Risk Characterization and Uncertainty sections of the report. The BRA should be revised accordingly.

Response:
See responses to General Comments 1 and 3.

7. Dieldrin should not have been eliminated from the HHRA on the basis of a comparison with its background concentration, as indicated in Table 1.1 of the BRA. In accordance with U.S. EPA's May 2002 *Role of Background in the CERCLA Cleanup Program*, dieldrin should be retained as a COPC because it exceeds its risk-based screening level. The magnitude of the dieldrin soil risk and its background source(s) should then be explicitly discussed in the risk characterization portion of the assessment.

Response:
See response to General Comments 1 and 3.

8. Similarly, benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene should not have been eliminated from the HHRA on the basis that there no known site-related historical use associated with these PAHs. These three PAHs should be retained as soil COPCs because their concentrations exceed risk-based screening levels as shown in Table 1.1 of the report.

Response:
See responses to General Comments 1 and 3.

9. The following corrections to the soil screening criteria should be made in Table 1.1:

- The more conservative water quality protection criterion of 0.4 mg/kg should be used for cis-1,2-dichloroethene;
- The more conservative water quality protection criterion of 0.6 mg/kg should be used for carbazole;
- The water quality protection criterion for endosulfan (which is also used as a surrogate for endosulfan sulfate) should be 18 mg/kg, not 180 mg/kg as shown;
- The more conservative industrial PRG of 35 mg/kg should be used for cyanide;
- The residential soil PRG has been used for manganese whereas the industrial soil PRG has been used for other constituents in Table 1.1.

Response:
The recommended changes to the soil screening criteria will be included in the revised BRA. Please note, however, that these changes will not result in selection of new COPCs, based on current data.

Section 3.2.2 Groundwater, page 14

10. Several constituents are eliminated as COPCs on the basis that they are not site-related. Per the general comments provided herein, contaminants cannot be eliminated from a baseline risk assessment on the basis that they are non-site related. Rather, they must be included in the quantitative risk assessment, but then may be qualitatively discussed in the Risk Characterization and Uncertainty sections of the report. The BRA should be revised accordingly.

Response:
See responses to General Comments 1 and 3.

11. A review of Table 1.2 indicates that the constituents 1,2-dichloroethane, tetrachloroethene, 1,1,2-trichloroethene, vinyl chloride, Arochlor 1242, alpha-BHC, beta-BHC, delta-BHC, alpha-chlordane, dieldrin, heptachlor, and heptachlor epoxide should not have been eliminated as COPCs from the HHRA on the basis that they have no known site-related history. The BRA should be revised to quantitatively evaluate these COPCs. A qualitative explanation for why these constituents are not believed to be site-related may be discussed in the Risk Characterization and Uncertainty sections of the report. The BRA should be revised accordingly.

Response:
See responses to General Comments 1 and 3.

12. Vinyl chloride is also eliminated on the basis that it is infrequently detected. However, the detection limits for all the vinyl chloride samples range from 2 to 2000 µg/L, which significantly exceed the risk-based screening level (Region 9 PRG) of 0.02 µg/L. Vinyl chloride is also typically associated with the other chlorinated chemicals that have been detected on site. For all these reasons, vinyl chloride should be retained as a COPC in groundwater.

Response:
See responses to General Comments 1 and 3, regarding the screening out of compounds derived from off-site sources. The detection limit and screening level for vinyl chloride established for the FI and BRA was 2 ug/l based on the MCL, and was specified in the approved FI Work Plan. In some samples, analytical interferences resulted in elevated detection limits above 2 ug/l. Please also refer to the response to General Comment 4, discussing the use of MCLs vs. PRGs as screening levels.

We concur that vinyl chloride is typically associated with other chlorinated compounds (specifically chlorinated aliphatics such as PCE, TCE, and the isomers of DCE) detected in on-site groundwater. The distribution of these compounds is most consistent with an off-site origin, specifically at the Pristine Site immediately upgradient, where these compounds are the primary basis for on-going remediation.

13. For several constituents, MCLs that are less conservative than their respective risk-based screening levels have been inappropriately used in Table 1.2 to screen COPCs. All contaminants should be re-screened using the more conservative of the MCL or U.S. EPA Region 9 PRG. Revise the HHRA accordingly.

Response:
See response to General Comment 4.

Section 3.2.3 Surface Water, page 14

14. A review of Table 1.3 indicates that the constituents beta-BHC, dieldrin, and heptachlor epoxide should not have been eliminated as COPCs from the HHRA on the basis that they have no known site-related history. Per the general comments provided herein, contaminants cannot be eliminated from a baseline risk assessment on the basis that they are non-site related. Rather, they must be included in the quantitative risk assessment, but then may be qualitatively discussed in the Risk Characterization and Uncertainty sections of the report. The BRA should be revised accordingly.

Response:
See response to General Comments 1 and 3.

15. For several constituents, MCLs that are less conservative than their respective risk-based screening levels have been inappropriately used in Table 1.3 to screen COPCs. All contaminants should be re-screened using the more conservative of the MCL or U.S. EPA Region 9 PRG. Revise the HHRA accordingly.

Response:
See response to General Comment 4.

Section 3.2.4 Sediment, page 15

16. A review of Table 1.4 indicates that the constituents benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, and beta-BHC should not have been eliminated as COPCs from the HHRA on the basis that they have no known site-related history. Per the general comments provided herein, contaminants cannot be eliminated from a BRA on the basis that they are non-site related. Rather, they must be included in the quantitative risk assessment, but then may be qualitatively discussed in the Risk Characterization and Uncertainty sections of the report. The BRA should be revised accordingly.

Response:
See response to General Comments 1 and 3.

17. Table 1.4 indicates that arsenic and thallium were eliminated as COPCs on the basis that on-site concentrations did not exceed background levels. The BRA should be revised to quantitatively evaluate these COPCs. A qualitative discussion for why these contaminants are not believed to

be site-related may be discussed in the Risk Characterization and Uncertainty sections of the report. The BRA should be revised accordingly.

Response: See response to General Comments 1 and 3.

Section 4.1.2 Land and Water Use, page 17

18. Previous review comments submitted on the FI Work Plan (Morton, 2000) required that additional specific information to be provided on the constituents in groundwater associated with the Morton Facility and the ability of the neighboring Pristine Superfund site remediation system to control COPCs from the Morton Facility. Previous review comments also asked for a determination of whether Morton COPCs in the upper aquifer had reached the lower aquifer, and if so, to include exposures associated with domestic use of groundwater. In response to the previous review, Morton assured that they would provide a determination of whether the lower aquifer had been impacted by Morton site COPCs, along with any necessary evaluations as to the effectiveness of the neighboring Pristine Superfund site in controlling Morton COPCs. This required information and evaluation is missing from the BRA report. Revise the document to specifically address the concerns that were brought up in the FI Work Plan review regarding the potential for Morton COPCs to impact potential domestic uses of groundwater.

Response:
The requested information was discussed in the FI Report. The revised BRA will include a more detailed discussion regarding the absence of Morton Facility constituents in the Lower Aquifer. See also the response to General Comments 4 and 5 to the FI Report and General Comment 8 to the BRA.

19. Previous comments on the FI Work Plan (Morton, 2000) specifically requested that the BRA report include information regarding studies performed to conclude that the upper aquifer does not serve as a source of drinking water. Morton agreed to provide references to studies already performed in the section discussing land and water use. This information is missing in the report. Revise the BRA to include the requested information.

Response:
The Current Conditions Report references a report by Ecology and Environment, Inc. (1991) prepared under contract to the U.S. EPA, that concluded that "private wells are virtually non-existent in Hamilton County" based on the prevalence of public supply. Please see also the response to General Comment 8.

20. The text indicates that the Upper Aquifer is not known to be used as a source of potable water, and that although the lower portion of the Lower Aquifer is widely used as a source of potable water, there are no known active supply wells at or in the immediate vicinity of the Morton Facility. The BRA also indicates that the Lower Aquifer groundwater is being controlled by the remediation system for the neighboring Pristine Superfund site. Thus, Morton does not evaluate groundwater as a potable water source in the BRA.

    It is noted that Morton does not have in place appropriate institutional controls to restrict current and future groundwater use on site. In addition, Morton does not have any control over groundwater use in off-site areas. It is also noted that any consideration of the remediation system for the neighboring Pristine Superfund site is to be included as a risk management activity, the impact of which should be assessed independent of, and following, a human health and ecological risk assessment. Therefore, Morton should revise the risk assessment to consider this exposure pathway and include the potential for groundwater to be used as a source of potable water.

Response:
See response to General Comment 8.

Section 4.2.1 Sources, Mechanisms of Releases, and Mechanisms of Transport, pages 19 and 20

21. The HHRA addresses only the generation of windborne fugitive dusts. Additional dusts that would be generated by construction or excavation activities are not modeled, although page 21 of the BRA states that construction activity dust generation is addressed. Explain why the methodology used to calculate a specific construction particulate emission factor (PEF) that would be relevant to construction workers outlined in U.S. EPA's *Supplemental Guidance for Developing Soil Screening Levels at Superfund Sites* (OSWER Directive 9355.4-24, March 2001) was not used. The BRA cites this document in Tables 4-1 through 4-10. (Note that this document is missing from the references list in Section 9.0 of the report.)

Response:
Note: This response is also applicable to Specific Comments 52 and 53.

Exposure parameters specific to the construction worker scenario, such as soil ingestion, were obtained from the Supplemental Guidance document. For the PEF, the Supplemental Guidance provides a detailed approach for addressing dust generated during construction. This approach, however, requires information that is not available for this site (e.g., number of vehicles, size of vehicles, vehicle miles traveled per day) because specific construction has not been planned. For this reason, we used the ambient air quality criteria of 50 ug/m^3 as discussed on page H-7; construction projects are typically required to meet this standard by

the use of dust control measures. (The PEF is the inverse of the standard adjusted for unit conversions.) The resulting PEF is higher than the PEF derived for fugitive windblown dusts. This discussion will be added to the BRA.

22. The decision to exclude potential exposure to contaminated fish through bioaccumulation of constituents in surface water and sediment should be revisited in light of the fact that many additional organic constituents should be retained as COPCs since they exceed risk-based screening criteria. Additionally, the lack of fish noted during the field visit conducted at the facility is not sufficient reason to exclude fish tissue exposures. The potential for Mill Creek to serve as a fishing source currently and in the future should be discussed in further detail. See Specific Comment 40.

Response:
The referenced bioaccumulation pathway will be addressed in the revised BRA. Please also see the response to Specific Comment 33.

23. With respect to biota exposures, identify the criteria that are used to determine which constituents present a potential to bioaccumulate.

Response:
In the revised BRA, the potential to bioaccumulate will be considered for site chemicals identified as "Important Bioaccumulative Compounds" in EPA's *Bioaccumulation Testing and Interpretation for the Purpose of Sediment Quality Assessment* (2000).

Section 4.3.1 Exposure Point Concentrations, page 22

24. Previous review comments on the FI Work Plan (Morton, 2000) required that improper references to the document cited as EPA 1992a would be removed and replaced with proper references to U.S. EPA's *Supplemental Guidance to RAGS: Calculating the Concentration Term*. Although Morton agreed to correct the referencing errors, the BRA continues to include the improper references. Revise the document accordingly.

Response:
The reference listed in Section 9.0 as U.S. EPA, 1992a is *Supplemental Guidance to RAGS: Calculating the Concentration Term*, which is the appropriate reference for this section.

Section 4.3.1.3 Surface Water, page 24

25. Table 3.3 presents dissolved concentrations of inorganic constituents used to generate exposure point concentrations (EPC) for surface water. However, to evaluate surface water exposures from incidental ingestion during recreation use (e.g., swimming, wading), it is not expected that surface water would be filtered. Rather, total (unfiltered) concentrations would be more representative of actual exposure conditions and should therefore be used to calculate EPCs for this exposure pathway. Morton should discuss this issue in detail, including the impact of using filtered versus unfiltered data on the risk assessment. This may also be addressed as part of the uncertainty analysis in the risk assessment.

Response:
This issue will be addressed as part of the Uncertainty Analysis in the revised BRA.

Section 4.3.1.5 Ambient Air, page 25

26. Section 4.3.1.5 identifies U.S. EPA's 2001 RAGS Part E, Draft Dermal Guidance, as the source of the particulate emission factor (PEF) model. The dermal exposure guidance does not include an evaluation of particulate emissions. The proper document reference should be provided.

Response:
The proper reference is U.S. EPA's 1996 Soil Screening Guidance, Technical Background Document. The revised BRA will list this reference.

Section 4.3.2 Exposure Equations, page 25

27. The equations for calculating dermal exposure dose from soil contact are stated to be taken from U.S. EPA's *RAGS, Part E: Supplemental Guidance for Dermal Risk Assessment* (OSWER Directive 9285.7-01e, September 2001). However, none of the soil dermal exposure equations in Tables 4.1 through 4.10 include a required parameter ABS_d (dermal absorption fraction). This means that the dermal risks from soil exposure may not have been correctly calculated in the BRA. Revise the risk assessment accordingly.

Response:
In Appendix I (page 8 of 45), the dermal absorption fraction was included in the calculations. When dermal exposure is included in a table, Tables 4.1 through 4.10 will be revised accordingly.

28. The equations for calculating dermal exposure dose from water contact are stated to be taken from U.S. EPA's *RAGS, Part E: Supplemental Guidance for Dermal Risk Assessment*

(OSWER Directive 9285.7-01e, September 2001). However, some of the water dermal exposure equations in Tables 4.1 through 4.10 and dermal exposure tables in Appendix I do not include a required parameter fraction absorbed (FA). No table can be found that summarizes the chemical-specific FA parameters for COPCs. This suggests that the dermal risks from water exposure may not have been correctly calculated in the BRA. Revise the risk assessment accordingly.

Response:
The revised BRA will include FA in the equation for dermal exposure to chemicals in water. For organic COPCs evaluated in water, the FA in the guidance was either 1.0, or was not specified by chemical, but was conservatively assumed to be 1.0. The requested revision, therefore, will not result in a change in the risk calculations. For the inorganics, FA is not considered in the calculation and is assumed to be 1.0.

Section 5.1 Toxicity Assessment, page 26

29. The non-cancer toxicity criteria presented in Table 5.1 should be corrected to reflect an oral reference dose (RfD) for thallium of 6.6E-5 from the IRIS database.

Response:
The table will be revised from 8.0E-5. This is not anticipated to significantly change the conclusions of the risk assessment.

Section 7.1.1.1 Terrestrial, page 40

30. The SERA states that federal and state agencies were contacted to determine the presence of special status species and habitats in proximity to the facility. The SERA should include an appendix that documents these contacts, including providing a copy of the response letter received from the organizations that were contacted.

Response:
The agency responses will be included as an appendix in the revised BRA.

Section 7.1.5 Exposure Pathways, page 49

31. The ecological conceptual site model (CSM) is discussed on page 49 and presented in Figure 6. The model is too generic because it only lists general categories of receptors (terrestrial, aquatic). The CSM should be revised to show the exposure routes for the communities (e.g., benthic invertebrates, fish) and guild (e.g., piscivorous birds, mammals) receptors that will be assessed in the SERA.

Response:
The figure will be revised to reflect exposure to communities and guild receptors.

Section 7.1.6 Ecological Receptors, page 50

32. Page 50 lists the ecological receptors that will be assessed in the SERA, but plants and soil invertebrates are omitted. These receptors should be included in the SERA, or rationale should be provided on why they should be excluded (e.g., absence of habitat).

Response:
Plant and soil invertebrates will be added to the ecological receptor list although most of the site is paved, covered with structures, or landscaped. The soil EDQLs are protective of plants and soil invertebrates. Areas exceeding screening criteria relevant to plants and soil invertebrates will be addressed with regard to the specific use of the property in that area

33. The statement on page 50 that fish and macroinvertebrates were not observed in Mill Creek should be either supported or deleted. Morton's description of the site reconnaissance indicates that it was not designed to evaluate the presence of invertebrates and fish in Mill Creek. For example, electroshocking or minnow trapping do not appear to have been performed to detect the presence of fish. Also, benthic sampling does not appear to have been performed, so it is unclear how Morton would detect the presence of benthic invertebrates. Any statements regarding the absence of biota observations must be qualified relative to the ability to detect the species in question.

Response:
Note: This response is also applicable to Specific Comment 23.

In the revised BRA, the statement will be qualified to read: "Fish and/or macroinvertebrates were not observed in Mill Creek during the creek reconnaissance. However, it is important to note that the reconnaissance program was limited to visual observation and did not include electroshocking, trapping, or other means of collecting aquatic organisms. Poor habitat provided by the artificial stream bed (e.g., rip rap) would not be conducive to a benthic invertebrate community, but would not preclude the development of such a community. Without a control, however, a benthic invertebrate study would provide little useful information, especially given the nature of the stream bed. A control along Mill Creek would be difficult, if not impossible".

Section 7.1.7 Screening Endpoints, page 50

34. Page 50 discusses the measurement endpoints, which are phrased as the likelihood of their occurrence. Measurement endpoints should be described as the actual measurements that will be used to quantify risks (e.g., comparison of media concentrations to screening toxicity values). The SERA should be revised to include a list of specific measurement endpoints for each community and guild receptor assessed.

Response:
The revised BRA will include a more detailed discussion of these endpoints. The measurement endpoints for the SERA were the media-specific HQs. A HQ >1 was used to identify the potential for risk. The HQs are known to be conservative due to the use of maximum concentrations in soil, sediment and water, and the screening nature of the EDQLs. For soils, the measurement endpoint was the protection of terrestrial plants and invertebrates. For sediments, the measurement endpoint was the protection of aquatic plants (including submergent macrophytes) and invertebrates. For surface water, the measurement endpoint was the protection of fish and invertebrates (benthic, pelagic, and surface).

Section 7.2 Chemical Screening, page 51

35. Pages 51 through 54 describe the process for screening out COPCs, which included eliminating chemicals that were (1) not associated with historical activities, (2) were not detected, (3) did not have a screening value, or (4) were below background. Current U.S. EPA (1997; 2001a; 2001b) states that non-detected compounds and compounds without benchmarks should be included as COPCs. Additionally, background data cannot be used to screen out COPCs in a SERA. The FI Work Plan (Morton, 2000) states that one half of the detection limit of a non-detected compound will be used to screen for COPCs (Section 6, p. 5), but this was not followed in the SERA. Morton must revise the SERA to be consistent with current U.S. EPA screening level guidance, including considering all chemicals that cannot be appropriately screened out. Also, chemicals cannot be eliminated as COPCs if they are presumed not to be associated with Morton Facility releases (p. 53), without additional justification and explanation in the SERA. For example, it is unclear how an apparently localized area of PCB contamination in site groundwater would not be attributed to site releases; this must be explained. The COPCs determined in the SERA can then be further examined in subsequent tiers of the assessment, such as the problem formulation phase of a baseline ecological risk assessment.

Response:
See response to General Comment 2. In addition, with regard to the apparently localized area of PCB contamination in site groundwater, please see the response to Specific Comment 2.

Section 7.2.1 Soil, page 51

36. The SERA discusses the use of soil data to a depth of four feet. Standard practice in ecological risk assessment is to use only surface soil data (e.g., to a depth of one foot). Morton may use only surface soil data if there are adequate data available for use in the SERA.

Response:
As discussed during the January 14, 2003 conference call, this comment was intended as a suggestion by the U.S. EPA. Because the four-feet criteria for surface soil was specified in the FI Work Plan, and was used as a basis for soil sampling to date, Morton feels it would be appropriate to continue its use in future evaluations.

Section 7.2.1.1 Background Soil, page 51

37. Page 51 and 52 discuss concentrations of chemicals in background soils. As noted in General Comment 1 and Specific Comment 35, current U.S. EPA guidance does not allow screening out chemicals using background data in a SERA. Any future use in subsequent tiers of the ecological risk assessment will require additional information, including; (1) a description of physical/chemical and ecological characteristics of the background locations; (2) justification for their selection; and (3) comparison to regional background levels. U.S. EPA guidance recommends the use of background data only for metals in tier 2 or baseline assessments, and organic compounds cannot be screened out based on background concentrations.

Response:
See response to General Comment 2.

Section 7.2.3 Seep, page 53

38. Page 53 states that total metal concentrations were compared to surface water screening values, rather than using dissolved concentrations of metals in seep water. Aquatic life ambient water quality criteria (AWQC) for metals is based on dissolved, rather than total metals (EPA, 1999). The facility may include a discussion of the uncertainties with assessing risks to aquatic life from total instead of dissolved metals concentrations.

Response:
Total metal concentrations will result in HQs (Table 10.3) that are typically much greater than those using dissolved metals concentrations, and should not be less. Given this, the approach used in the BRA is quite conservative. Morton will consider this issue in future sampling, and will also evaluate accepted methods of calculating or estimating dissolved metals

concentrations based on total metals data. This data will be considered in the revised BRA, including the discussion of uncertainties.

39. Page 54 suggests that seep contributions to Mill Creek are very limited. Rather than speculate, this section should include a worst case calculation of surface water concentrations using maximum seep flows and minimum stream flows. The calculation should include all seeps that may discharge contaminants to the creek. The seep locations on the figures should be clearly labeled. For example, stream stations are shown on Figure 4, but it is unclear what samples were collected at these locations (e.g., sediment, and seep samples).

Response:
Seep conditions including seasonal creek water levels, the characteristics of the on-site French drain, dimensions of seeps relative to shoreline, and stream flows relative to seep flows will be discussed in the revised SERA. Seep sample locations were coincident with stream station locations shown on Figure 4.

Section 7.3 Risk Characterization, page 54

40. Pages 54 to 55 discuss ecological risks from contaminated soil, sediment, and seeps, but wildlife risks are not characterized. Bioaccumulative contaminants were used on site (e.g., organotin compounds noted on page 4), and have been detected on site (e.g., PCBs in groundwater). The SERA must be revised to include an assessment of wildlife risks to potentially bioaccumulative compounds; see Table 4-2 of EPA (2000) for a candidate list of bioaccumulative compounds. The SERA must include the specific rationale and justification for any excluded contaminants and potentially complete exposure pathways (e.g., why a chemical was detected but did not result from site activities, and what were potential non-facility sources).

Response:
Table 4-2 in U.S. EPA (2000) is primarily concerned with compounds in sediment that bioaccumulate in fish and are of concern to humans via fish ingestion. While many of these compounds can accumulate in wildlife at concentrations sufficient for adverse effects (*e.g.*, pesticides, PCBs, methylmercury), it would be incorrect to draw the conclusion that all compounds in Table 4-2 bioaccumulate or biomagnify in wildlife. For example, virtually none of the compounds in Table 4-2 bioaccumulate in the tissue of a herbivorous mammal. On the other hand, many would biomagnify in wildlife that consume fish. Based on current data, the COPCs with significant bioaccumulation and biomagnification potential would be 4,4'-DDE, dieldrin, mercury (if methylated), and possibly dichlorobenzenes. Of these compounds, HQs

for 4,4'-DDE and dieldrin for seep water yield 99.99% of the potential risk. 4,4'-DDE and dieldrin are not site-related COPCs.

Because the SERA could not rule out the presence of aquatic invertebrates and fish in Mill Creek, these are potentially important exposure pathways. Although the observed nature of Mill Creek in this area (i.e., the absence of observed fish, a stream bed composed of concrete rubble) makes it unlikely that these pathways are complete, they will be evaluated in the revised BRA as a part of the next tier of ecological risk assessment.

41. Risks from contaminated soil, sediment, and seep water (p. 54-55) must be re-assessed according to the Specific Comments above. This will likely result in additional COPCs that should be noted in the risk description. Morton must provide a specific explanation for each chemical with a hazard quotient (HQ) greater than one that is not considered a COPC. Additionally, the risk characterization section should summarize the HQs determined in the SERA. For example, multiple HQs exceed 100, but this is not apparent in the text of this section.

Response:
The risk characterization will be updated during the revision of the risk assessment to include a more detailed discussion of the HQs.

42. Morton should ensure that the screening levels used (Tables 10.1 to 10.3) are consistent with the FI Work Plan (Morton, 2000), which specifies that Ohio screening values will be used if available. For example, Table 10.3 shows a screening value for barium of 5000, whereas the Ohio outside mixing zone average (OMZA) criteria screening level is 220 and would result in an HQ exceedance. Multiple other chemicals have surface water screening values that are greater than OMZA aquatic life values; this should either be corrected or explained by Morton. Additionally, if U.S. EPA Region 5 and Ohio screening values are not available for a specific chemical, alternative benchmarks should be considered. Standard sources include NOAA (1999), Efroymson et al. (1997), and Suter (1996).

Response:
Section 6.2 of the FI Work Plan (Revision 01, May 2001) specified that U.S. EPA Region 5 Environmental Data Quality Levels (EDQLs) would be used in the SERA. The EDQLs were provided in Appendix A of the FI Work Plan (Tables A1-5, A1-7, and A1-8 for soil, sediment, and surface water, respectively) and were used in the subsequent SERA. When Region 5 EDQLs are not available for a given compound, alternative screening levels, including Ohio standards, will be considered.

43. A required component of the SERA is a discussion of uncertainties, but this component is not included in the report. A section of the SERA should include an explicit discussion of uncertainties and the potential to under or over estimate risks. For example, analytes may not include all possible site-associated contaminants (e.g., underestimation of risks) and site soil data include potentially more contaminated subsurface soil (e.g., overestimation of risks).

Response:
A discussion of uncertainties will be added to the revised BRA.

Section 7.4 Ecological Significance, page 55

44. Page 55 discusses the ecological significance of the risk results but does not provide a balanced summary of the results. For example, there are multiple HQs greater than 100, and the adequacy of analytical detection limits relative to screening benchmarks does not appear to have been evaluated (i.e., undetected chemicals may pose risks). Also, multiple analytes were sampled only once in sediments, so broad statements regarding an absence of risk can not be made with certainty. The ecological significance of contaminants at the Morton site must be re-evaluated in the SERA.

Response:
The SERA will be revised to reflect previous comments and Morton's responses. As a part of this revision, the discussion of ecological significance will be modified as well.

Section 8.0 Conclusions, page 55

45. The relatively high carcinogenic risks (1×10^{-4}) to the outdoor industrial worker are stated to be driven largely by contaminants in the localized sampling area labeled T-1. The text dismisses the risk results by stating that concentrations outside of T-1 are at least an order of magnitude lower, which would result in an acceptable risk level. Additionally, the high hazard index (20) for the construction worker are stated to be driven by contaminants located in specific areas of the site, including sampling area T-1. The text indicates that concentrations beyond this area were at least an order of magnitude lower. This should be demonstrated quantitatively as a refinement to the risk assessment, with a less conservative assumption that outdoor workers are exposed to soil concentrations reflective of a more representative portion of the site, rather than the localized area around T-1 be used to calculate risks. This alternate quantitative result should be presented in the BRA report, rather than simply claiming that the risks would be acceptable under a different set of assumptions. The text of the report should also discuss the potential that the T-1 sampling area is a hot-spot that may require remediation.

Response:
An alternative assessment of risk or comparison of exposure point concentrations for chemicals identified as significant contributors to risk in the T-1 area will be included in the risk characterization of the revised BRA.

46. The conclusions section indicates that the hazard index is 1.1 for the outdoor industrial worker. Rather than merely dismissing this result as a product of overly conservative assumptions related to the selection of exposure point concentrations, the risk report should note that the hazard index does not take into effect target organ effects. When the hazard index is properly partitioned into target organ effects, the hazard indices are acceptable for the outdoor worker.

Response:
This revised BRA will include the referenced note.

47. The BRA concludes that additional assessment of ecological risks are unnecessary. As noted in the General and Specific Comments above, this conclusion is not supported. Morton must first revise the SERA following current U.S. EPA national guidance. Any COPCs determined in the SERA must then be evaluated in subsequent ecological risk assessment phases.

Response:
Evaluation of ecological risks will be reassessed in the revised BRA based on the above comments.

APPENDICES

48. In general, it is unclear why unshaded negative values are shown in the appendix tables (only shaded negative values are defined). The BRA should specify detection limits for all non-detected chemicals in each media, so that the adequacy of detection limits relative to the risk based screening levels for human and ecological risks can be assessed. This should be discussed in the report text. Appendices A through D should be revised to include this information.

Response:
The unshaded negative values were inadvertently left unshaded. Negative values indicate chemicals below detection limits with the value reflecting the sample-specific detection limit. The shading was added in an effort to make the values more easily distinguished at a glance. The range of detection limits for all chemicals was specified in Tables 1.1 to 1.4. Samples with elevated detection limits occasionally occurred as a result of interference in samples, but did

not significantly impair data quality. The revised BRA will include a discussion of detection limits.

Appendix H Vapor Migration Modeling

49. The equation to calculate the soil VOC emission rate on page H-2 is stated to be taken from U.S. EPA's *Soil Screening Guidance: Users Guide and Technical Background Document* (EPA540/R-95/128, May 1996). However the equation in this form cannot be located in the referenced document. It appears that Morton has altered the equation in the guidance used originally to calculate the volatilization factor (VF). However, it is unclear how the inverse dispersion factor (Q/C) and the VF from the guidance are related to the emission rate (Ei) and soil concentration (Cs) in the BRA Appendix H. Either identify more precisely where in the referenced U.S. EPA document the Ei equation is located, or revise Appendix H to walk the reader more clearly through the transformation of the VF equation from the guidance into the Ei equation used in the risk assessment.

Response:
On page 23 of the Technical Background Document, the equation for the VF is presented in a context where a screening level (rather than risk or hazard index) is calculated. To calculate risk or hazard index using this approach, the inverse of the VF multiplied by the soil concentration (presented on page H-2) would be used. The dispersion factor (Q/C) is used with the emission rate to estimate an air concentration for the purpose of assessing exposure. Appendix H will be revised to more clearly describe this transformation.

50. Provide a reference source for the equation used to calculate the total solute concentration (CT) shown on page H-3.

Response:
The equation on page H-3 is based on an equilibrium relationship between vapor, adsorbed and dissolved phased chemicals in soil (Jury, W.A., Spencer, W.F. and Farmer, W.J., 1983, Behavior Assessment Model for Trace Organics in Soil: I. Model Description, Journal of Environmental Quality, 12(4) 558-566).

51. The equation to calculate the Q/C parameter on page H-6 of Appendix H is said to be taken from U.S. EPA's *Soil Screening Guidance: Users Guide and Technical Background Document* (EPA540/R-95/128, May 1996). However the equation in this form cannot be located in the referenced document. The more updated U.S. EPA's *Supplemental Guidance for Developing Soil Screening Levels at Superfund Sites* (OSWER Directive 9355.4-24,

March 2001) indicates that Q/C equation (with data for the Cleveland OH area as used by Morton) should be:

$$Q/C = 12.8612 * \exp[(\ln A - 20.5164)^2 \div 237.2798]$$

Confirm that BRA has used the most up-to-date methodology to calculate the site-specific Q/C term.

Response:
The equations used in the BRA were derived for the Morton Facility, using the methods presented in the Users Guide and Technical Background Document to consider sites with areas different than those specified in that document. The BRA will be revised to incorporate the approach from the 2001 Supplemental Guidance. The difference between the two approaches is minor with respect to the results of the risk assessment (approximately 1 percent difference).

52. The risk calculation for construction workers relies on a default particulate emission factor (PEF) of 2×10^7 m^3/kg provided on page H-7 of Appendix H. The reference source for this default value is not identified in the text or tables of the report. It is also unclear what relevance the ambient air quality standards for particulates (PM10) has to the use of a default PEF for the construction worker, as stated on page H-7. U.S. EPA's *Supplemental Guidance for Developing Soil Screening Levels at Superfund Sites* (OSWER Directive 9355.4-24, March 2001) provides methodology for calculating a site-specific Q/C factor for construction worker exposures that addresses the increased dust generation due to construction and excavation activities. Explain why this recent guidance methodology was not used, and provide justification and the reference source for use of a default PEF.

Response:
See response to Specific Comment 21.

53. Response to previous comments on the FI Work Plan (Morton, 2000) indicated that exposure to both mechanical and wind-driven suspension of particulates in air should be addressed. Morton's response indicated that an evaluation of particulates from both types of emissions would be considered in the risk assessment. Explain why only fugitive (wind-driven) dust exposure is addressed. Note that exposure to dusts from construction activities should be addressed for both on-site and off-site receptors.

Response:
See response to Specific Comment 21.

Appendix I Human Health Risk Assessment Calculations

54. The equation to calculate the PEF is presented on page 6 of Appendix I. It appears that there is a mathematical problem in the spreadsheets that cannot be accounted for simply as a rounding error. When the parameter values provided in the table are input into the equation shown in the table, the PEF for manganese is 8.70E+8 and the PEF for other inorganics is 1.28E+9. Use of these corrected lower PEF values is more conservative in the risk assessment.

Response:
The difference between the PEFs presented in Appendix I and in the comments are the result of a rounding error in the calculation, because the value shown in Appendix I for F(x) has fewer significant figures than the value carried by the spreadsheet (0.2 versus 0.194). This will be corrected in the revised BRA.

55. Page 8 of Appendix I presents dermal absorption fractions (ABS) for soil exposures that do not agree with the ABS parameters provided in U.S. EPA's *RAGS, Part E: Supplemental Guidance for Dermal Risk Assessment* (OSWER Directive 9285.7-01e, September 2001). This most recent dermal exposure guidance does not recommend default fractions for inorganics or volatiles lacking chemical-specific ABS values. Revise the HHRA accordingly.

Response:
The revised BRA will use 0 for dermal absorption of volatile chemicals and metals unless specified in the guidance. This will reduce the risk estimates for the dermal exposure pathway.

56. Explain why a permeability constant (Kp) is not provided for acetone or 4-methylphenol in the table on page 8 of Appendix I. U.S. EPA's RAGS, Part E: Supplemental Guidance for Dermal Risk Assessment (OSWER Directive 9285.7-01e, September 2001) provides equations for calculating the Kp parameter.

Response:
The values on page 8 of Appendix I are based on values presented in Exhibit B-2 of the 2001 Dermal Guidance. Values for K_p were not presented in that guidance for acetone or 4-methylphenol. A K_p value was calculated for these chemicals on page 12.

57. The table summarizing physicochemical properties on page 9 of Appendix I is missing the constituents cadmium and 4-methylphenol. Revise the table to include these missing constituents.

Response:
The revised BRA will present the rows for these chemicals, which were inadvertently hidden on the print out.

58. The table on page 10 of Appendix I incorrectly lists the organic carbon partition coefficient (Koc) for methylene chloride. The correct Koc (from the reference document cited) should be 1.17E+1 l/kg. Revise the risk assessment accordingly.

Response:
The Koc listed, 1E+1 L/kg, will be revised to 1.17E+1 L/kg. This change should not have a significant effect on the outcome of the risk assessment.

59. The table on page 12 of Appendix I presents the parameters and equations used to calculate the dermal dose per event (DA_{event}) for water exposures. There are a number of problems with the equations as presented.

- Both DA_{event} equations are missing a chemical-specific parameter for fraction absorbed (FA).
- The second DA_{event} equation in the table lists a factor in the equation as $(1+B^2)$ when the correct factor should be $(1+B)^2$.
- The equation to calculate Dsc is incorrect and should be 10^(-2.80 - 0.0056MW)*l_{sc}. (The parameter l_{sc} corresponds to skin thickness.)
- The equation for the parameter b should be [2(1+B)2/p] - c.

All of the values on the page 12 table of Appendix I should be corrected as appropriate to reflect the proper equations.

Response:
Appropriate changes will be made in the revised BRA.

62. The reference source for the information in the page 12 table of Appendix I lists simply EPA 1998. This does not clearly correspond to any documents listed in the references section of the report. It is also unclear why the EPA 2001 dermal guidance should not be listed as the source of the dermal exposure equations. Revise the table accordingly.

Response:
The reference will be corrected to reflect EPA, 2001. (EPA, 1998 was the previously appropriate reference.)

63. There appears to be a spreadsheet programming error in the table on page 13 of Appendix I. When the provided parameters are input into the equation to calculate the Concentration Soil (CT), the values do not agree with those provided in the page 13 table. It is also unclear why the column listing the Diffusivity in Air (Di) is provided since the parameter does not appear in any of the equations presented in the table. The spreadsheet errors should be corrected as appropriate.

Response:
Diffusivity in air is not required for this calculation. The calculation in the spreadsheet was incorrect. This will be corrected in the revised BRA. This change will make a greater difference with highly volatile chemicals (e.g., acetone) than with less volatile chemicals, but is not anticipated to alter the overall conclusions of the BRA.

64. Explain why the table on page 13 of Appendix I includes no calculated Concentration Soil Vapor (Cv) or CT values for aniline or 4-methylphenol.

Response:
These compounds were not considered volatile for the purpose of assessing inhalation in air based on EPA's definition of volatile compounds (page 9 of Appendix I). Therefore, the CT calculation was not required.

65. The table on page 18 of Appendix I lists the groundwater concentrations for 1,3-dichlorobenzene, lead, and thallium as zero. The correct concentrations should be 0.041 mg/l, 0.024 mg/l, and 0.0078 mg/l, respectively.

Response:
This results from a formatting error in the referenced table, which will be corrected in the revised BRA.

66. The table on page 18 of Appendix I appears to include a spreadsheet programming error. All of the groundwater concentrations expressed in units of g/cm^3 are off by a factor of 1×10^{-3}. The spreadsheet and subsequent risk calculations should be corrected as appropriate.

Response:
The error will be corrected in the revised BRA.

67. The table on page 18 of Appendix I appears to include a second spreadsheet programming error in the calculation of the Ei expressed in units of g/m^2-sec. All the values appear to be low

by a factor of 10. The spreadsheet and subsequent risk calculations should be corrected as appropriate.

Response:
The error identified in Specific Comment 67 and a subsequent conversion error from cm^2 to m^2 resulted in the values being low by a factor of 10. This will be corrected in the revised BRA. This will increase calculated risks and hazard indexes by a factor of 10 for this pathway, which is only applicable to the construction worker.

68. The table on page 20 of Appendix I should be revised to provide appropriate parameter values for exposure frequency, inhalation rate, and exposure time. Currently these parameters are listed as "NA" (not applicable).

Response:
This will be changed in the revised BRA, but does not affect the risk calculations.

69. The table on page 27 of Appendix I should be revised to identify the PEF parameter values.

Response:
This will be changed in the revised BRA, but does not affect the risk calculations.

70. The table on page 34 of Appendix I appears to contain a spreadsheet programming error. It appears that an incorrect PEF value of 1×10^6 was used. The spreadsheet and subsequent risk calculations should be corrected as appropriate.

Response:
The spreadsheet will be corrected in the revised BRA.

Appendix J Blood Level Evaluation

71. Explain why an exposure frequency of 219 days/year was used for the worker blood level evaluation. All other worker scenarios use an exposure frequency of 250 days/year. Explain the lack of consistency.

Response:
The blood lead evaluation is based on potential fetal blood levels resulting from exposure by the mother during pregnancy while she is at work. The default value provided in the guidance was 219 days.

Revised Compliance Schedule for Data Management Morton International, Inc. (Rohm and Haas Company), Cincinnati, Ohio Site

PREPARED FOR: Mirtha Capiro/USEPA Region 5

PREPARED BY: Jennifer Telford/CH2M HILL
Joel Wipf/CH2M HILL

COPIES: Peter Palena/Rohm and Haas
Paul Cichy/Rohm and Haas

DATE: February 20, 2003

The following compliance schedule is submitted for review to USEPA on behalf of Rohm and Haas Company, detailing milestones for partial fulfillment of the Region 5 RCRA 3008h Administrative Order given for the Morton International, Inc., Cincinnati, Ohio site. This schedule has been prepared based on the outcome of our meeting on January 22, 2003 at USEPA Region 5 offices. Please note that a majority of the schedule is contingent on the date of approval of the Data Management Plan (DMP) from USEPA.

The test case electronic data deliverable (EDD) identified in the schedule will provide the data from the groundwater monitoring event conducted in October 2002. In addition, we have included a line item for revising the DMP after the test case EDD submittal. If USEPA has comments regarding the test case EDD that warrant a revision of the DMP, the document will be modified and resubmitted to USEPA. Following approval of the DMP and test case EDD, we will discuss with USEPA the incorporation of the previous data into the data management process.

If you have any questions regarding this schedule, please contact Peter Palena/Rohm and Haas at (215) 785-7079 or Joel Wipf/CH2M HILL at (773) 693-3809.

TABLE 1
Compliance Schedule Milestones
Morton International, Inc (Rohm and Haas Company), Cincinnati, Ohio Site

Milestone	Duration	Start Date	End Date
Submission of Final Compliance Schedule to EPA	--	--	01/29/2003
EPA Review of Final Compliance Schedule	1 week	01/30/2003	02/05/2003
Submission of Final DMP to EPA	--	--	03/03/2003
EPA Review of Final DMP	2 weeks	03/04/2003	03/17/2003

TABLE 1
Compliance Schedule Milestones
Morton International, Inc (Rohm and Haas Company), Cincinnati, Ohio Site

Milestone	Duration	Start Date	End Date
Preparation and QC of Rohm and Haas EDDs for Test Case*	4 weeks*	DMP approv.**	DMP approv. +4 weeks
Preparation and QC of EPA Region 5 Draft EDDs for Test Case	1 week	DMP approv. +4 weeks	DMP approv. +5 weeks
Submission of All Test Case EDDs to Rohm and Haas	--	--	DMP approv. +5 weeks
Rohm and Haas Review of All Test Case EDDs	1 week	DMP approv. +5 weeks	DMP approv. +6 weeks
Resolution of Potential Issues with Test Case EDDs	1 week	DMP approv. +6 weeks	DMP approv. +7 weeks
Submission of Region 5 Draft EDDs for Test Case to EPA	--	--	DMP approv. +7 weeks
EPA Review of Region 5 Draft EDDs for Test Case	2 weeks	DMP approv. +7 weeks	DMP approv. +9 weeks
Revise Final DMP (tentative, if necessary)	1 week	EPA comments to test case EDD	EPA comments to test case EDD +1 week

*Duration dependent on level of effort needed to perform data entry of all required data, as well as status of all laboratory and subcontractor deliverables.

**Schedule for test case EDDs dependent on EPA approval of DMP.

Mirtha Capiro
03/03/03 01:01 PM

To: jwipf cc: PCichy, Peter_V_Palena, luck_kevin
Subject: Morton International Inc.'s Request for Clarification on Data Management Items 5 and 6

Joel,

Please see our response to remaining clarification items below. Please contact me for any questions. Thanks.

U.S. EPA's Response to Request for Clarification

Item 5 Location Identifiers for QC Blank Samples

QC Blanks aren't associated with a specific location, therefore, when submitting data for QC Blanks the data provider should NOT enter ANY data in the location table for the QC Blank. The QC Blank should be entered in the SMP file and simply leave the sys_loc_code field blank for the QC blank sample. I believe that's all that needs to be said about comment 5.

Rohm and Haas should not use "SITE" for the sys_loc_code. If they do EQuIS will identify it as an error and not import the data. Also "surf_elev", "x_coord", and "alt_x_coord" can't be left null. These are required fields in the location file and if left null EQuIS will not allow import of the data.

The bottom line is that no data related to QC blank samples need to appear in the LOC EDD file. So, if you collect 15 samples and one QC blank, the LOC file will have 15 rows, and the TRS (sample result) file will have 16 rows.

Item 6 Surface Elevations/Sample Depths for QC Blank Samples and Surface Water Stations/Samples

"surf_elev" is a field in the LOC file. Because, as we stated in #5 above, QC Blank samples should not have any data entered in the LOC file, the "surf_elev" becomes irrelevant for QC Blanks.

Regarding the surface water samples, I suggest they use the average annual elevation for the river/ surface water body at a location near the sampling location to populate the surf_elev field in the LOC file. (The location and source of the average annual elevation figure should be described in the remarks/ comment field.) In the start_depth field in the SMP file, they should report the depth below water surface at which they started to take the sample, and in the end_depth field in the SMP file, they should report the depth below water surface at which they ended taking the sample. (In most cases, the start_depth and end_depth won't be too far apart.)

The surface water elevation **at the time of the sample collection** should be reported in the GWTR EDD file in the field called "historical_reference_elevation". (The GWTR file was developed to record groundwater elevation data, but it can be used to record surface water data also. We're in the process of revising the EDD Spec Manual to make this more clear.)

There are several other fields in the GWTR file that are required and need to be populated. These required fields are listed below. Please use the following guidance when inputting surface water data elevations to the GWTR file:

FIELD	DATA
sys_loc_code	Use the appropriate sys_loc_code from the location table
sys_well_code	Report as "None"
measurement_date	Report the date of sample collection
measurement_time	Report time of measurement

historic_reference_elev Report the surface water elevation in feet

water_level_depth Report as "0.0" (This is used for groundwater measurements)

Leave all other fields in the GWTR null, with the exception of the "remark" field which is optional and can be used to record comments regarding the surface water elevation.

Mirtha Capiro
03/03/03 01:32 PM

To: jwipf cc: PCichy, Peter_V_Palena, luck_kevin
Subject: Morton International Inc.'s Request for Clarification on Data Management Item 4

Joel,

Below is our clarification on Item 4 which remained to be addressed by U.S. EPA.

U.S. EPA's Response to Request for Clarification

Item 4 Additional 26 QA/QC Checks Performed on EPA Region 5 EDDs

Please see attachments below for your usage (due to the size of the attachments this will include 2 messages).

1. The Data Integrity Application - this is an Access database that contains a set of queries to offer an additional level of data verification before your EDD submittal.

2. Data Integrity Application User Manual chapters - this should answer most of the questions you may have about the application itself.

If you should have more specific questions about the tool, please feel free to call Kevin Luck of Booz Allen Hamilton at (312) 807-4734.

If you have any additional questions, please call. Thank you.

8-EDD Data Validation Summary Rep

Mirtha Capiro
03/03/03 01:38 PM

To: jwipf
Subject: Morton International Inc.'s Request for Clarification on Data Management Item 4

----- Forwarded by Mirtha Capiro/R5/USEPA/US on 03/03/03 01:38 PM -----

Mirtha Capiro
03/03/03 01:38 PM

To:
Subject: Morton International Inc.'s Request for Clarification on Data Management Item 4

This is my second attempt to send additional attachment.

Summary Report_V1_4.

Mirtha Capiro
02/20/03 06:13 PM

To: "Wipf, Joel/CHI" <jwipf@CH2M.com>
Subject: RE: Compliance Schedule - Morton International (Rohm & Haas) - Cincinnati, OH site

Thank you for submitting the final schedule regarding electronic data deliverables for the Morton International Inc. facility. U.S. EPA has no further comments. Please implement.
"Wipf, Joel/CHI" <jwipf@CH2M.com>

"Wipf, Joel/CHI" <jwipf@CH2M.com>
02/20/03 05:31 PM

To: Mirtha Capiro cc: "Telford, Jennifer/WDC", "Cichy, Paul", "Palena, Pet
Subject: RE: Compliance Schedule - Morton International (Rohm & Haas) - Cincinnati, OH site

Mirtha, attached is the revised compliance schedule for the above referenced site. We have modified the submittal per your comments in the e-mail below. Please feel free to contact me if you have any questions regarding the revised information. Thanks.

Joel D. Wipf
Project Manager/Group Leader
8501 West Higgins, Suite 300
Chicago, IL 60631
(773) 693-3800 Ext. 253 (Phone)
(773) 693-3823 (fax)
(414) 454-8858 (e-fax)
e-mail: jwipf@ch2m.com

-----Original Message-----
From: Capiro.Mirtha@epamail.epa.gov
[mailto:Capiro.Mirtha@epamail.epa.gov]
Sent: Tuesday, February 04, 2003 3:40 PM
To: Wipf, Joel/CHI
Cc: Telford, Jennifer/WDC; Cichy, Paul; Palena, Peter; luck_kevin@bah.com
Subject: Re: Compliance Schedule - Morton International (Rohm & Haas) - Cincinnati, OH site

Joel,

Thanks for providing the draft schedule as discussed at our recent meeting. Below are our comments on the schedule.

a) For clarity, the title from the schedule should identify the Morton International Inc. facility.
b) The schedule is to specify what the "test case EDDs" consists of in terms of corresponding field activities and time of implementation. For example, please identify the monitoring event, pump test activities, etc.
c) Potentially, it may be determined that revisions to the DMP are warranted based on the results of the Test Case. It would be appropriate to include a tentative item for revising the DMP as necessary after receipt of U.S. EPA's comments on the Region 5 Draft EDDs from Test Case. This would serve to further clarify Morton's goals for conducting a Test Case.
d) It would be appropriate to acknowledge that upon completion of the

Mirtha Capiro

02/20/03 09:28 AM

To: "Telford, Jennifer/WDC" <jtelfor1@CH2M.com>
Subject: Re: Questions Memo - Morton International (Rohm & Haas) - Cincinnati, OH site

Jennifer/Paul/Peter,

We are still compiling responses to your questions. However, we have consulted our chemist Brian Freeman on item 1 and he indicated that your proposed approach for use of blind sample identifiers is appropriate. I thought I would let you have this information, so your team could proceed on this issue. Also, you can prepare a QAPP modification as proposed. I will contact you as soon as I have some time frame information for all responses. Thanks.
"Telford, Jennifer/WDC" <jtelfor1@CH2M.com>

"Telford, Jennifer/WDC" <jtelfor1@CH2M.com>

02/14/03 10:16 AM

To: Mirtha Capiro cc: "Cichy, Paul", "Palena, Peter", "Wipf, Joel/CHI", luck
Subject: Questions Memo - Morton International (Rohm & Haas) - Cincinnati, OH site

Mirtha, attached is the memo of questions and items for resolution that we discussed sending to you during our meeting on January 22, 2003.

As you directed at the meeting, the memo includes the request to change the current sample nomenclature (all blind identifiers) to the Rohm and Haas nomenclature presented by Paul Cichy at the meeting. With the new nomenclature, only field duplicate samples will continue to be sent to the lab with blind identifiers to satisfy QA/QC requirements.

If you have any questions regarding the information in the document, please feel free to contact Paul Cichy, Joel Wipf, or myself.

Thanks.

Jen Telford
CH2M HILL
703-471-6405 x4336

MeetingQuestions_EPA.

January Meeting Questions - Data Management Rohm and Haas Company, Cincinnati, Ohio Site

PREPARED FOR: Mirtha Capiro/USEPA Region 5

PREPARED BY: Jen Telford/CH2M HILL
Joel Wipf/CH2M HILL

COPIES: Peter Palena/Rohm and Haas
Paul Cichy/Rohm and Haas
Kevin Luck/Booz Allen Hamilton

DATE: February 14, 2003

The following questions/items for resolution are submitted to USEPA on behalf of Rohm and Haas Company relating to data management for the Cincinnati, Ohio site. These questions are based on the outcome of our meeting on January 22, 2003 at USEPA Region 5 offices.

If you need clarification on any of these questions or would like to discuss them further prior to responding, please contact Paul Cichy/Rohm and Haas at (215) 785-7734 or Joel Wipf/CH2M HILL at (773) 693-3809.

1. Use of Blind Sample Identifiers

EPA indicated that having full sample identifiers according to the Rohm and Haas nomenclature in the electronic data deliverable (EDD) field [sys_sample_code] would be more useful than the blind sample identifiers specified by the existing quality assurance project plan (QAPP) for the Cincinnati site.

In order to approve such a change in QAPP procedure, EPA recommended that a request be sent detailing the proposed change. This request is as follows:

Rohm and Haas requests that all normal environmental samples, quality control (QC) samples (blanks), and volumes collected for matrix spike and matrix spike duplicate analyses be submitted to the designated laboratory using the proposed Rohm and Haas nomenclature as identifiers in place of blind sample identifiers. To satisfy quality assurance (QA) requirements, all field duplicate samples will continue to be submitted to the laboratory with blind sample identifiers. Prior to submitting the data to EPA in the Region 5 EDD format, the blind sample identifiers for field duplicate samples will be switched with the Rohm and Haas identifiers.

2. Choosing Level of QA/QC

In response to the question on how to decide what QA/QC level is required, EPA responded that they would look into what approach should be taken. Rohm and Haas stated during the meeting that they are currently required to validate data for a percentage of samples collected at the Rohm and Haas Cincinnati site.

3. Understanding of Differences Between Detection Limits

The meeting discussion and subsequent emails have not lead to an entirely clear and consistent understanding of the differences between method detection limit, quatitation limit, and "reporting detection limit" (as referred to in the EDD), the later of which is to be supplied in the EDD. Rohm and Haas recommends having a conference call with EPA to clarify this issue.

4. Additional 26 QA/QC Checks Performed on EPA Region 5 EDDs

EPA indicated that a Microsoft (MS) Access database tool used to conduct 26 additional EDD checks would be made available to Rohm and Haas via email to Dr. Paul Cichy. Using this tool as part of the QA/QC process prior to submission will reduce the likelihood of EDD rejection. Please provide this tool as soon as it can be made available.

According to meeting comments made by representatives of EPA and Booz Allen Hamilton, this tool performs data checks beyond those capable by both the Electronic Data Lab Checker (ELDC) and the EQuIS database import utility.

5. Location Identifiers for QC Blank Samples

EPA stated that they would look into whether or not records in the location EDD needed to be supplied for QC blank samples (trip blanks, equipment blanks, field blanks), and if so, the nature of such location records with regard to required fields containing spatial information (primary coordinates, alternate coordinates, surface elevation, etc.). Rohm and Haas indicated that, internally, they assign all QC samples to the station identifier "SITE" and set the coordinates for this station to a point on an onsite structure.

6. Surface Elevations/Sample Depths for QC Blank Samples and Surface Water Stations/Samples

How should the required field [surf_elev] in the location EDD be handled for QC blank samples (assuming location records are required) and surface water stations. Typically, the elevation for ground surface would be stored in this field. Surface elevations of any type are not appropriate to QC blank samples. At surface water stations, usually sample depths are measured from the surface water level, not ground surface (top of sediment bed); what then is the elevation that should be stored in [surf_elev]? Stage elevations fluctuate and can not serve as a consistent datum. Average annual stage elevations do not represent the actual surface water levels during sampling events, and therefore will not serve as the datum for the actual sample depths in sample EDD.

How should the "if available" fields [start_depth] and [end_depth] in the sample EDD be handled for QC blank samples and surface water samples? Should these fields be null for QC blank samples? Should the sample depth(s) for surface water samples be measured from the surface water level? How does this correlate with the reported surface elevation in the location EDD?

Agenda – USEPA Region 5 / Rohm and Haas Meeting

January 22, 2003

1) **Introductions**
2) **Data Management Plan Elements**
   a) Introduction/Overview
   b) Data Collection and Management Team (Roles and Responsibilities)
      i) Sampling Contractor (SC)
      ii) Laboratory Contractor (LC)
      iii) Data Management Contractor (DC)
   c) Data Management Process (i.e. "Data Flow")
      i) Event Planning
         (1) Data Collection Requirements
         (2) Data Quality Objectives
         (3) Analytical Program
      ii) Sample Collection and Logging
         (1) Locations
         (2) Depths
         (3) Dates
      iii) Sample Tracking and Chain of Custody (to be consistent with Project QAPP)
         (1) Sample Naming Nomenclature
         (2) Bottle Labeling
         (3) Chain of Custody Forms
         (4) Laboratory Sample Identification
      iv) Entry and Transfer of Field, Geologic, and Analytical Data
         (1) Field and Geologic Data Entry
            (a) Data Requirements
            (b) Procedures for Entry
            (c) Production of Rohm and Haas Geo EDDs and QC
         (2) Lab Analytical Data Entry (Chem)
            (a) Sample Data Provided by SC to Lab

(b) Lab Data Requirements

(c) Methods of Data Shipment to Sampling Contractor

(d) Production of Rohm and Haas Chem EDDs and QC

(e) Lab Check on Data Format

(3) Lab Analytical Data Check-in and QC (Chem)

(4) Data Loading

(5) Production and QC of EPA Region 5 EDDs

(a) Resolution of Data Errors and Conflicts

(i) Contacts

(ii) Procedures

v) Data Deliverables

(1) Rohm and Haas EDDs

(a) Formats

(b) Media

(c) Methods of Shipment to Rohm and Haas

(2) USEPA Region 5 EDDs

(a) Formats

(b) Media

(c) Methods of Shipment to USEPA Region 5 and Rohm and Haas

(d) Management of Change – USEPA Region 5 modifications of Data Structure

d) Data Management Technology

i) EquIS (or Comparable) Relational Database

ii) Excel/Access Data Templates and Tools

e) Database Administration

i) User Access and Security

ii) File Backup

3) Schedule

a) Milestone Deliverables and Dates

4) Discussion

Attendees List
RCRA 3013 Investigation – Data Management Meeting
Rohm and Haas Cincinnati Facility
U.S. EPA ID No. OHD 000 724 138
22 January 2003

U.S. Environmental Protection Agency Region 5
77 W. Jackson Street Chicago, Il 60604

Initials	Name	Organization	Telephone	Email
MC	Mirtha Capiro	U.S. EPA Region 5	(312) 886-7567	Capiro.Mirtha@epa.gov
KL	Kevin Luck	Booz Allen Hamilton	312-807-4734	luck_kevin@bah.com
PP	Peter Palena	Rohm and Haas Company	(215) 785-7079	ppalena@ROHMHAAS.COM
	Paul Cichy	Rohm and Haas Company	(215) 785-7734	pcichy@rohmhaas.com
JW	Joel Wipf	CH_2M- Hill	773-693-3800 x253	jwipf@ch2m.com
JT	Jennifer Telford	CH_2M- Hill	703-471-6405 x4336	jtelfor1@CH2M.com
MH	Mark Hemingway	Geomatrix Consultants, Inc.	(512) 494-0333	mhemingway@geomatrix.com
EKS	Erin Sullivan	Booz Allen Hamilton	312/807-4736	sullivan_erin@bah.com
HB	Heather Borland	Booz Allen Hamilton	312-807-4742	borland_heather@bah.com
DB	Dan Briller	Booz Allen Hamilton	312-807-4735	briller_dan@bah.com
DW	David Wilson	USEPA	312 886-1476	wilson.David@EPA.gov
PC	PAUL CICHY	ROHM AND HAAS	215-785-7734	PCICHY@ROHMHAAS.com

Attendees List
RCRA 3013 Investigation –FI Comments Meeting
Rohm and Haas Cincinnati Facility
U.S. EPA ID No. OHD 000 724 138
23 January 2003

U.S. Environmental Protection Agency Region 5 – Room 612B
77 W. Jackson Street Chicago, Il 60604

Initials	Name	Organization	Telephone	Email
MC	Mirtha Capiro	U.S. EPA Region 5	(312) 886-7567	Capiro.Mirtha@epa.gov
RK.	Richard Kuhlthau	Booz Allen Hamilton		<rkuhlthau@cox.net>
By PHONE	Kathy Rogovin	Booz Allen Hamilton		rogovin_kathy@bah.com
DB	Dan Briller	Booz Allen Hamilton		briller_dan@bah.com
PP	Peter Palena	Rohm and Haas Company	(215) 785-7079	ppalena@rohmhaas.com
RL	Ron Lantzy	Rohm and Haas Company	(215) 785-7456	rlantzy@rohmhaas.com
P/C	Paul Cichy	Rohm and Haas Company	(215) 785-7734	pcichy@rohmhaas.com
MP H	Mark Hemingway	Geomatrix Consultants, Inc.	(512) 494-0333	mhemingway@geomatrix.com
AH	Anne Haikola	Geomatrix Consultants, Inc.	(512) 494-0333	annehaikola@hotmail.com
By PHONE	MACE BARRON	BOOZ ALLEN HAMILTON	(303) 684-9646	

Discussion of Facility Investigation
USEPA offices in Chicago, Illinois
January 23, 2002
Meeting Minutes

Meeting Participants:

Mirtha Capiro – U.S. Environmental Protection Agency
Doug Yeskis - U.S. Environmental Protection Agency
Richard Boice - U.S. Environmental Protection Agency
Peter Palena – Rohm and Haas Company
Ron Lantzy – Rohm and Haas Company
Mark Hemingway - Geomatrix Consultants, Inc.
Anne Haikola - Geomatrix Consultants, Inc.

The meeting began at 9:47. Participants introduced themselves and explained their relationship to the project.

Peter Palena introduced the goal for the meeting, which was to explain the general findings to date and determine what, if any, data gaps exist relative to meeting the Administrative Order (AO) requirements and submit the final Facility Investigation Report due to the USEPA in June 2002.

Mark Hemingway provided an overview of the project using an overhead presentation and data summary maps. During this presentation the following points were discussed in more detail:

- Issue 1: Final remedy had not been addressed:
  - Mirtha Capiro stated that the final remedy had not been addressed in the list of project objectives and wanted to make it clear to Rohm and Haas that this is part of the RCRA process. There was general agreement among Rohm and Haas and Geomatrix that the RCRA process of investigation and corrective measures is well understood. The objective of the AO, however, and therefore the meeting, was to address the project status relative to the investigation. This was not to say that the issue of final remedy was not being considered. In fact, Rohm and Haas has initiated both human health and ecological risk assessments as part of the investigation process, as detailed in the Facility Investigation Work Plan. The objective of the FI is to understand the nature and extent of any potential problems. Rohm and Haas understands that additional information may need to be collected prior to initiating corrective action.
- Issue 2: Document sharing and other environmental investigation activities that

Discussion of Facility Investigation
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January 23, 2002
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are ongoing in the Reading, Ohio area:

- The USEPA representatives stated that the US Geologic Survey (USGS) is performing a study of the Mill Creek area and would be interested in receiving copies of boring logs from the Morton facility. Rohm and Haas stated that the field copies of all boring logs have been submitted to the USEPA in the four Quarterly Progress Reports (the first Progress Report was submitted in March 2001 for the previous calendar quarter). Rohm and Haas further offered that, as final electronic boring logs are generated, Geomatrix could submit these logs to USEPA prior to completion of the final report.
- Rohm and Haas provided a CD-Rom containing the EQuIS database files, to the USEPA at this meeting. The CD-ROM contained a base map, geologic data, well completion data and analytical results for soils and groundwater.
- Rohm and Haas reiterated the fact that all reports generated to date related to this project are available in a document repository at the City of Reading. This includes the Current Conditions Report, Facility Investigation Work Plan, and all quarterly Progress Reports. In addition to providing copies of the documents, Geomatrix gave a presentation to a Reading community action group regarding the scope of work and findings associated with the FI.
- General Electric (GE), a neighboring facility in Reading, Ohio, is currently performing a corrective action and an extensive study of the regional hydrogeology. A copy of the Description of Current Conditions was provided to GE's consultant at O'Brien and Gere Engineers in June 2001 at the request of USEPA Region 5.

- Issue 3: The placement of Lower Aquifer well LAW12-60:

  - Rohm and Haas and Geomatrix consider the location, which is adjacent to the former surface impoundments along the north property boundary, to be representative of a source well and adequate to determine if Morton has impacted this aquifer. The well is placed just outside the northern edge of the impoundments approximately in the middle of the six surface impoundments. Historically, waste was placed in the easternmost ponds, and liquids were decanted from pond to pond, progressing to the west. Ponds filled with liquids should have radial flow, and the gradient within the Lower Aquifer has varied through the years under the influence of the former City of Reading Well field (northwest groundwater flow) and now the Pristine Superfund Site

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groundwater reclamation system (southeast groundwater flow). Hydrogeologically, the well's location should allow us to determine the presence of groundwater contamination related to historical Morton plant operations in the Lower Aquifer. After two sampling events at this well, the chemicals detected include DCE and DCA which are representative of contamination from the Pristine site. There were no detections of tin or dichlorobenzenes, which are considered to be Morton indicator chemicals.

- The USEPA considers this well to be potentially upgradient of the surface impoundments. The USEPA believes that the westerly component of flow in the upper aquifer/interbedded sand units underlying the former surface impoundments, in combination with the current and historical flow directions in the lower aquifer, necessitates an additional lower aquifer monitoring well. Placement of a lower aquifer well or couplet is recommended in the vicinity of location UAW05/06. The USEPA believes this location would be the optimal location based on currently available data and the understanding of past historical conditions of ground-water flow in the lower aquifer. The USEPA noted in this meeting that the absence of Morton indicators in the lower aquifer at the UAW05/06 location would more likely resolve their concerns about possible Morton impact to the lower aquifer.
- Regarding the Pristine Superfund Site Groundwater Plume: Doug stated that the highest groundwater concentrations relating to the Pristine plume have been measured in the lower portion of the Lower Aquifer. The geology is complicated and he believes the presence of possible fractured clays, "holes" in the till, inhomogeneities, and other factors make it difficult to predict vertical movement within the upper aquifer and between the upper and lower aquifers.

- Regarding understanding of groundwater plumes: USEPA would like to see contour maps of a few target Morton chemicals in groundwater, with data segregated by screen intervals (i.e., upper and lower portion of the Upper Aquifer). In addition, USEPA would like to see similar contour maps for a few of the chemicals that Morton considers to be representative of contamination from the Pristine site, such as DCE and DCA.
- Regarding the presence of acetone in groundwater: It is currently Rohm and Haas' s understanding that acetone is used in small quantities in the lab. It is not currently known to be used in any of the plant operations. However, Rohm and

Discussion of Facility Investigation
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Haas will research the possible historical use of acetone and the possibility that acetone might be a by-product of a reaction. Given acetone's solubility, not much is needed to create a plume. Given acetone's tendency to move quickly, the presence of acetone suggests a recent (within the last few years) release.

- Regarding the combined sewer system: Mirtha inquired about the involvement of other local entities in regulating the integrity of the sewer system. Rohm and Haas indicated that the Cincinnati Metropolitan Sewer District (MSD) regulates discharge requirements only and is not involved in on-site sewer integrity issues. Mirtha suggested that the improvement of the sewer system would be part of a RCRA corrective action. The replacement and/or repair of the combined sewer system would not be managed by the Rohm and Haas remediation division. It would be considered a facility improvement, which would be directed by the plant personnel.
- Regarding Background Sampling: Mirtha stated that USEPA has only agreed with Rohm and Haas's background sampling locations. USEPA has not agreed on how the background data can be used. Mirtha suggested that Rohm and Haas prepare a letter summarizing their approach on the use of background data to the USEPA prior to preparation of the final report.
- TechLaw noted that the field operating procedures did not address the collection of split soil samples for duplicate analysis with the USEPA. Other than this, TechLaw did not identify any problems with the sampling procedures, which they observed. Geomatrix noted that those procedures were not described because they were considered an EPA activity. A discussion of the field operating procedure used to split soil samples during trenching activities will be documented in the final FI report.
- USEPA requested that the final report include a description of the methodology used for soil sampling during trenching activities, including the basis for selection of sample locations.

Action Items:

1. USEPA requested that Rohm and Haas drill and collect Lower Aquifer groundwater samples in the vicinity of the UAW05 and UAW06 locations. The strategy would be to grab groundwater samples at shallow and deeper portions of the Lower Aquifer and send the samples for 24-hour turn around. If no Morton indicator compounds are detected in the grab samples, a Lower Aquifer well will be installed with a well

Discussion of Facility Investigation
USEPA offices in Chicago, Illinois
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screen completed in the upper part of the aquifer. If Morton compounds are detected, a Lower Aquifer well would be installed that screens the zone of higher impact.

2. USEPA is in agreement with Rohm and Haas's proposal to collect sediment samples within Mill Creek. However, Mirtha needs more time to evaluate the sediment-sampling interval and will respond back to Rohm and Haas with a decision.
3. Rohm and Haas will continue to provide the USEPA with updates to the EQuIS database.
4. Rohm and Haas and Geomatrix will describe all planned field activities, including a project schedule for 2002 in a letter(s) to the USEPA.
5. Rohm and Haas will continue to investigate the possible sources of acetone at the plant.
6. Rohm and Haas and Geomatrix will submit a letter to USEPA documenting the intended use of background soil sampling data
7. Rohm and Haas and Geomatrix will prepare graphical representations (e.g. contour map or chemical distribution map) of selected Upper Aquifer chemical data for USEPA review. Geomatrix recommends the selection of total BTEX, total chlorobenzenes, and acetone. USEPA requests that Geomatrix provide contour maps for chromium, arsenic, antimony, and tin which are some of the metals related to Morton's operations. Additionally, USEPA requests that contour maps be created for chemicals that Morton considers to be representative of contamination from the Pristine site such as DCE and DCA.
8. Geomatrix will submit electronic versions of the boring logs to USEPA prior to completion of the final report.

GEOMATRIX CONSULTANTS, INC.
FIELD OPERATING PROCEDURE
Morton International, Inc.
RCRA Facility Investigation of Reading, Ohio, Facility

MONITORING WELL DEVELOPMENT

PURPOSE

This procedure describes the methods for the development of wells. Wells are developed after installation in order to remove introduced water and drilling fluids, reduce the turbidity of the water, and improve the hydraulic communication between the well and the water-bearing formation. Well development will not commence until the annular grout seal has cured, but will be performed within ten calendar days of well installation.

PROCEDURE

1. All well development will include surge blocking or false bailing with one or more of the following fluid removal methods. Well development activities may include:

   - Bailing
   - Air Lifting
   - Submersible Pumping
   - Other methods as approved by the Geomatrix Field Team Leader.

   The appropriate water removal method will be selected based on water level depth and anticipated well productivity.

2. Assemble and decontaminate equipment (if necessary), and place it in the well. Reference the Geomatrix Field Operating Procedure for Drilling and Excavation Equipment Decontamination.

3. Alternate the use of agitation methods with water removal methods, using the former to suspend solids in the well water, and the latter to remove the turbid water. For example, use a vented surge block to agitate the well, moving up and down within the screened interval, then use a pump to clear the well. A bailer may be used for both purposes, by surging with the bailer (false bailing) for a period within the screened interval, then bailing a volume of water from the well.

4. When using surging methods, initiate this activity gradually, with short (2 to 3 feet) strokes. After several passes across the screened interval, increase the speed and length of the surge strokes.

MONITORING WELL DEVELOPMENT

5. Continue development until the following objectives are achieved:

   - Field parameters (pH, specific conductance, temperature) stabilize. Fluctuations beyond 10 percent above or below a mean value will not be considered stable.

   - The well will generate non-turbid water during continued pumping. A turbidity level of 5 nephelometric turbidity units (NTU) will be used as a general target, but will not be considered a rigid standard, since many wells cannot achieve that level of clarity.

   - In the case of mud-rotary drilled wells, the volume of water removed exceeds twice the volume of water lost to the formation during the drilling process, as indicated by the water balance. For all wells, a volume of water equivalent to at least two well volumes (casing plus filter pack porosity volume) will be removed, provided the well has adequate yield to support this removal volume.

6. Document the development methods, volumes, field parameter measurements, and other observations on the attached Geomatrix Well Development Record form (see Field Operating Procedures for Documentation Requirements of Drilling and Well Installation).

Attendees List
RCRA 3013 Investigation – Data Management Meeting
Rohm and Haas Cincinnati Facility
U.S. EPA ID No. OHD 000 724 138
22 January 2003

U.S. Environmental Protection Agency Region 5
77 W. Jackson Street Chicago, Il 60604

Initials	Name	Organization	Telephone	Email
MC	Mirtha Capiro	U.S. EPA Region 5	(312) 886-7567	Capiro.Mirtha@epa.gov
KL	Kevin Luck	Booz Allen Hamilton	312-807-4734	luck_kevin@bah.com
PP	Peter Palena	Rohm and Haas Company	(215) 785-7079	ppalena@ROHMHAAS.COM
	Paul Cichy	Rohm and Haas Company	(215) 785-7734	pcichy@rohmhaas.com
JW	Joel Wipf	CH_2M- Hill	773-693-3800 x253	jwipf@ch2m.com
JT	Jennifer Telford	CH_2M- Hill	703-471-6405 x4336	jtelfor1@CH2M.com
MH	Mark Hemingway	Geomatrix Consultants, Inc.	(512) 494-0333	mhemingway@geomatrix.com
ES	Erin Sullivan	Booz Allen Hamilton	312/807-4736	sullivan_erin@bah.com
HB	Heather Borland	Booz Allen Hamilton	312-807-4742	borlund_heather@bah.com
DB	Dan Briller	Booz Allen Hamilton	312-807-4735	briller_dan@bah.com
DW	David Wilson	USEPA	312 886-1476	wilson.David@EPA.gov
PC	PAUL CICHY	ROHM AND HAAS	215-785-7734	PCICHY@ROHMHAAS.COM

100 INDEPENDENCE MALL WEST, PHILADELPHIA, PA 19106-2399 USA
TELEPHONE (215) 592-3000 CENTRAL FAX (215) 592-3377

REPLY TO:
GINEERING DIVISION
X 584
BRISTOL, PA 19007
(215) 785-7000 FAX (215) 785-7458

ROHM AND HAAS

13 December 2002

Ms. Mirtha Capiro
Enforcement and Compliance Assurance Branch
Waste, Pesticides and Toxics Division
U.S. Environmental Protection Agency (USEPA)
Region 5 (DE-9F)
77 West Jackson Street
Chicago, Illinois 60604-3590

Re: Morton International, Inc.
Reading, Ohio Facility
RCRA Docket No. R3013-5-00-001

Via: E-Mail andCertified Mail – Return Receipt Requested - 7099 3400 0002 5895 1694

This letter is to document the schedule agreed to during a teleconference conducted between representatives of Rohm and Haas Company, USEPA Region 5, Geomatrix and Booz Allen and Hamilton on December 6, 2002. The attached schedule is to address the additional work identified in the USEPA's letter received via email on November 22, 2002.

The November 22, 2002 correspondence requests a work plan for the evaluation of the French Drain. Rohm and Haas Company submitted a work plan to USEPA to investigate the efficacy of the French Drain in September 2002 and conducted the test in October 2002. Therefore, the schedule reflects this completed work and addresses the submission of this investigation's report. Also, the USEPA is requesting the submission of status reports on a quarterly basis. Morton will submit a status report in January 2003.

Thank you for your cooperation during this project. We look forward to continuing to work with you in a timely and efficient manner in addressing the issues at the facility. If you have any questions, please do not hesitate to contact me at (215) 785-7079.

Sincerely,

Peter V. Palena Jr.

Peter V. Palena Jr.
Rohm and Haas Company
Corporate Remediation Manager

Schedule for Comment Response
Morton International Inc.
Cincinnati, Ohio Facility

December 6th, 2002
9:30 Central Time (10:30 Eastern Time)
Conference Call

Company: Rohm and Haas - North America Region
Host: Peter Palena
Call Title/Reference: Cincinati-FI Conference Call
Confirmation Number: 6546838
Dial In: 1 (888) 490-6948
Alternate Dial-In:
International participants should dial: 1 (847) 413-2427
Passcode: 8821429

Attendees:

Mirtha Capiro, USEPA Region 5
Peter Palena, Rohm and Haas Company
Kathy Rogovin, BAH
Mark Hemingway, Geomatrix
Richard Kuhlthau, BAH
Anne Haikola, Geomatrix

----- Agenda Topics -----

Introductions	ALL	10
Meeting Objectives	PVP	5
Actions since Report Submitted	Geomatrix	10
Proposed Schedules		
Electronic Deliverables	PVP	10
French Drain Test Report	Geomatrix	10
Additional Characterization Work	Geomatrix	15
Review Action Items	PVP	5
Meeting Wrap up	PVP	5

Other Information

Agenda

Rohm and Haas - Cincinnati Facility
Discussion of Facility Investigation

January 23rd, 2002
9:30 AM to Noon
U.S. Environmental Protection Agency
Region 5
77 W. Jackson Street
Chicago, Il 60604

Type of meeting:

Attendees:

Mirtha Capiro, USEPA Region 5
Todd Quillan, TechLaw
Mike Welly, TechLaw

Peter Palena, Rohm and Haas Company
Ron Lantzy, Rohm and Haas Company
Mark Hemingway, Geomatrix
Anne Haikola, Geomatrix

Agenda topics

Review of Project Objectives	Peter Palena
Summary of Completed Field Activities	Mark Hemingway
Overview of Investigation Findings	Mark Hemingway
❖ Site Geology/Hydrogeology	
❖ Impact to Groundwater	
➢ Upper Aquifer	
➢ Lower Aquifer	
❖ Background Soils	
❖ Mill Creek	
Review individual SWMUs	Mark Hemingway
❖ Former Surface Impoundements	
❖ Former Neutralization Tank	
❖ Former Drum Storage Area	
❖ Former Sulfide Waste Treatment Tank	
❖ Former Swale Area	
❖ Combined Sewer Sysetm	
Remaining Field Activities/Schedule	Mark Hemingway
Questions	All
Review Action Items	Peter Palena
Meeting Summary	Peter Palena

Attendees List
RCRA 3013 Investigation Summary Meeting
Rohm and Haas Cincinnati Facility
U.S. EPA ID No. OHD 000 724 138
23 January 2002

U.S. Environmental Protection Agency Region 5
77 W. Jackson Street Chicago, Il 60604

Initials	Name	Organization	Telephone	Email
MC	Mirtha Capiro	U.S. EPA Region 5	(312) 886-7567	Capiro.Mirtha@epa.gov
TQ	Todd Quillen	TechLaw Inc.	617/720-0320 x124	tquillen@techlawinc.com
not present	~~Mike Welly~~	~~TechLaw, Inc.~~	~~(312) 345-8955~~	~~mwelly@techlawinc.com~~
PP	Peter Palena	Rohm and Haas Company	(215) 785-7079	NAJXPP@ROHMHAAS.COM
RJL	Ron Lantzy	Rohm and Haas Company	(215) 785-7456	RONALD_J_LANTZY@ROHMHAAS.COM
MH	Mark Hemingway	Geomatrix Consultants, Inc.	(512) 494-0333	mhemingway@geomatrix.com
AH	Anne Haikola	Geomatrix Consultants, Inc.	(512) 494-0333	annehaikola@hotmail.com
RCB.	Richard Boice	U.S. EPA	(312) 886-4740	boice.richard@epa.gov
	Doug Yeskis	US EPA	312-886-0408	yeskis.douglas@epa.gov
	[illegible]			

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF

DE-9J

FEB 03 2003

VIA E-MAIL AND
CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Peter V. Palena
Corporate Remediation Manager
Rohm and Haas Company
P.O. Box 584
Route 413 and State Road
Bristol, Pennsylvania 19007

Re: RCRA § 3013 Administrative Order
Additional Comment on Facility Investigation and Request for Additional Work
Morton International, Inc.
U.S. EPA ID No. 000 724 138

Dear Mr. Palena:

We are providing an additional comment on the June 2002 Facility Investigation (FI) Report and Baseline Risk Assessment (BRA) for Morton International Inc. (Morton) as a follow up to our call of January 14th and meeting of January 23rd regarding the November 25, 2002 letter of Request from Additional Work from the United States Environmental Protection Agency (U.S. EPA). Morton shall implement the requirements of this comment as part of the Work Plan for Additional Work. The U.S. EPA comment is below.

ADDITIONAL COMMENT

As part of the Work Plan for Additional Work, Morton shall address existent data gaps with respect to the nature and extent of contamination in the east bank of Mill Creek, and to sediments within the creek. In addition, Morton shall submit for U.S. EPA review and approval all appropriate modifications to the Quality Assurance Project Plan that may be necessary for implementing the requirements of this comment. The QAPP modifications shall be included with the Work Plan for Additional Work.

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FI Report, Section 5.6.1, Former Impoundments and Drum Storage Area - SWMUs 1 & 3

This section describes the character of suspected sources for the Former Impoundments and Drum Storage Area. The text from this section indicates that "Extensive dark soil staining was observed (see Figure 5-12), but did not correlate with high organic contents in soils. This suggests that the staining may be related primarily to reduced metals or sulfides, rather than organics. As shown on Figures 5-13 through 5-16, and summarized in Tables 5-2 through 5-5, soils contained low concentrations of a number of VOCs, SVOCs, and metals, including aniline, phenols, chlorobenzenes, BTEX, methylene chloride, acetone, and tin."

FI Report, Appendix A, Boring Logs and Monitoring Well Completion Diagrams

Our review of the boring log information from Appendix A indicates that "black staining" or "black discoloration" were observed in several additional well locations mostly through the central and western portions of the facility extending around the former impoundments. The table below summarizes most of these additional well locations. Similarly, soil staining has been formerly documented in well logs from locations MW-3 and MW-4 as found in the Description of Current Conditions. As our review indicates, the analytical results from soil samples associated with intervals showing "black staining" or "black discoloration" at these additional well locations indicate the presence of low concentrations of polychlorinated biphenyls (PCBs), metals and volatile and semi-volatile compounds (VOCs and SVOCs).

Location	**Depth of interval showing "black staining" or "black discoloration" as per well log observations**	**Depth of sample interval(s)** **(NA means not analyzed)**
STR01	20.5 - 21.5 ft 73 ft, 88 ft	3 ft, 21 ft, 73 ft, 88 ft
STR02	11 - 13 ft	1 ft, 12.5 ft
STR03	4 ft, 6 ft, 13.25 ft	4 ft, 12.5 ft
STR04	17 - 17.5 ft 19.5 - 20.5 ft	1.5 ft, 17.5 ft
STR05	9 ft, 11.3 - 11.5 ft	1.5 ft, 9 ft
STR07	16 - 18 ft	1.5 ft, 18 ft
STR08	9 - 14.5 ft	1.5 ft, 13 ft

(continued)		
UAW01-80	29.4 - 29.5 ft, 67 ft 77.5 - 78 ft	Sampling at location UAW1-30
UAW02-20	15 -17 ft	NA
UAW02-40	16 ft	NA - see STR07
UAW03-20	15.5 ft - 17 ft	NA - see STR02
UAW04-20	11.8 - 13.7 ft	10 ft
UAW05-20	10.5 - 13.5 ft	13 ft
UAW06-20	8.5 - 12.5 ft	1.5 ft, 11.5 ft
UAW08-20	10.5 - 19.5 ft	13 ft
UAW11-40	6.5 - 14.5 ft	2 ft, 10 ft
UAW12-20	4 - 15 ft	12 ft
UAW13-20	5 - 15.5 ft	1.5 ft, 11.5 ft
UAW-16-10	12.1 - 15 ft	2 ft, 5.5 ft
UAW17-40	4.5 - 5 ft	1.5 ft, 5 ft
UAW18-20	10 - 13.9 ft	1 ft, 15 ft
UAW20-60	2 ft	1.5 ft, 9.5 ft
UAW25-40	See STR01	NA - see STR01
DP01	2 ft	2 ft, 9.5 ft
DP02	2 ft	2 ft, 9.5 ft
DP08	11 ft	6 ft, 11 ft
DP10	5.5 ft	2 ft, 10 ft
DP20	14.5 - 15 ft	2 - 14.5 ft
DP27	4 - 6 ft	NA

The information above indicates that soil staining was observed at the area of the former impoundments extending through at least the central and western portions of the facility in a pattern that appears to be dictated by the spatial relationship between the permeable sand and

underlying clay in the upper aquifer. It appears that in addition to the characterization provided in Section 5.6.1 of the FI Report, the soil staining may be attributable to organic contamination associated with nonaqueous phase liquid (NPLs) in groundwater and soil. Possibly, organic compounds present in samples of stained soil may have been missed or biased low due to matrix masking effects. Therefore, it would be inappropriate to limit the scope of investigations related to pathways of contaminant migration from soil in this area to other media, such as soil-groundwater and groundwater-surface water-sediment.

Field Oversight and Split Sampling Trip Report from TechLaw Inc., dated April 5, 2002

We have reviewed the results from the April 5, 2002, Field Oversight and Split Sampling Trip Report prepared by TechLaw Inc. (a copy of this report has been previously mailed to you). Among other aspects, the TechLaw's report includes the results of sampling and analysis of split sediment samples at selected locations from actual or potential seep areas from the bank of Mill Creek. TechLaw's analysis for organic compounds included Solid Waste (SW)-846 Methods 8260B for VOCs, 8270C for SVOCs, 8081 for pesticides, 8082 for PCBs, and 8280A for polychlorinated dibenzo-*p*-dioxins and dibenzofurans. For sediments, the following SVOCs and PCBs were detected in a TechLaw's split sample corresponding to SS-3 from the FI: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, chrysene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, pyrene, aroclor 1248, aroclor 1254 and aroclor 1260. In addition, the following PCBs were detected in Techlaw's split sediment sample corresponding to location SS-2 from the FI: aroclor 1248, aroclor 1254 and aroclor 1260.

Based on the aspects discussed above and the overall information from the FI and BRA, U.S. EPA has made the following determinations:

- The list of sampling parameters for Mill Creek included compounds that have been found at detectable concentration in groundwater within the shallow transmissive zone from the upper aquifer. This parameter list was designed on the premise that those compounds could potentially migrate from the Morton facility to Mill Creek and that there was an absence of surface water discharge. The list of sampling parameters for Mill Creek only considered the groundwater results from the initial monitoring conducted in May 2001. The May 2001 monitoring included a lesser number of wells as compared to subsequent monitoring. According to the FI Report and BRA, additional contaminants have been detected in groundwater at the facility, such as PCBs.

- Additionally, the results from TechLaw's report indicate that some organic compounds not found in groundwater are present at detectable concentrations in sediment at the area of groundwater-surface water interface from Mill Creek. This information suggests that current groundwater quality conditions do not fully

represent the dynamics of contaminant migration at the facility. This is likely due to complex factors associated with the timing of releases and nature and fate of contaminants, such as NPLs. Moreover, at the groundwater-surface water interface, it is expected that groundwater feeds surface water most of the time. Therefore, contaminants present at detectable concentrations at the groundwater-surface water interface from Mill Creek are expected to be largely related to migration of contamination from groundwater to surface water.

If you have any questions regarding this letter, please contact me at (312) 886-7567 or at "capiro.mirtha@epa.gov".

Sincerely,

Mirtha Capiro
Project Coordinator/Manager
Enforcement and Compliance Assurance Branch

cc: Thomas C. Nash, C-14J
Harold O'Connell, OEPA
Mark Hemingway, Geomatrix Consultants, Inc.

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REPLY TO:
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ROHM AND HAAS

11 February 2003

Ms. Mirtha Capiro
Enforcement and Compliance Assurance Branch Waste,
Pesticides and Toxics Division
U.S. Environmental Protection Agency
Region 5 (DE-9F)
77 West Jackson Street
Chicago, Illinois 60604-3590

VIA: Overnight Courier Airbill # 7915 3360 8246

Re: RCRA § 3013 Administrative Order
Additional Comment on Facility Investigation
and Request for Additional Work
Morton International, Inc.
U.S. EPA ID No. 000 724 138

This letter is to document the response schedule to the additional comments on the Facility Investigation (FI) Report and the Baseline Risk Assessment (BRA) provided by the USEPA via email on January 30th, 2003, and also to request clarification of some of the comments to assure that the responses are complete and address the specific issues of the USEPA. Rohm and Haas will submit a response to the comments by March 7th, 2003. This date assumes that the clarifications to the issues listed below are provided by February 21st, 2003.

The following is a list of issues generated from the review of the comments.

USEPA Comment

It appears that in addition to the characterization provided in Section 5.6.1 of the FI Report, the soil staining may be attributable to organic contamination associated with nonaqueous phase liquid (NPLs) in groundwater and soil.

Clarification Requested:

- Does the USEPA believe that mobile or residual NPL exists at this time?
- If not, does USEPA believe that the NPL was present at one time and currently does not exist? In this case, what specific data is USEPA relying on to determine that NPL previously existed?

USEPA Comment

Possibly, organic compounds present in samples of stained soil may have been missed or biased low due to matrix masking effects. Therefore, it would be inappropriate to limit the scope of investigations related to pathways of contaminant migration from soil in this area to other media, such as soil-groundwater and groundwater-surface water-sediment.

Clarification Requested:

- What specific contaminants does the USEPA believe are being masked by the matrix, and what is causing this masking?
- What samples does the USEPA believe may have experienced this masking?
- Is it the USEPA conceptual model that PAHs and PCBs could have moved through the groundwater, but are not currently detectable in groundwater sampling?
- What additional pathway does the USEPA want Rohm & Haas to investigate, with respect to Mill Creek seeps and sediments?

USEPA Comment

According to the FI Report and BRA, additional contaminants have been detected in groundwater at the facility, such as PCBs.

Clarification Requested:

- What additional contaminants is the USEPA requesting be added to the seep and sediment sampling parameter list?

Thank you for your consideration in this matter. Please call me if you have any questions or concerns.

Sincerely,

Peter V. Palena Jr.

cc: Bruce Beiser, Rohm and Haas Company
Robin Cole, Rohm and Haas Company
Mark Hemingway, Geomatrix Consultants Inc.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF

DE-9J

FEB 18 2003

VIA E-MAIL AND
CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Peter V. Palena
Corporate Remediation Manager
Rohm and Haas Company
P.O. Box 584
Route 413 and State Road
Bristol, Pennsylvania 19007

Re: RCRA § 3013 Administrative Order
Clarification on Facility Investigation and Additional Work
Morton International, Inc.
U.S. EPA ID No. 000 724 138

Dear Mr. Palena:

We are providing the clarification you requested on the items below concerning the U.S. EPA review of the June 2002 Facility Investigation (FI) Report and Baseline Risk Assessment (BRA) for Morton International Inc. (Morton).

Clarification items:

- Does the U.S. EPA believe that mobile or residual NPL exists at this time?
- If not, does U.S. EPA believe that the NPL was present at one time and currently does not exist?
- In this case, what specific data is U.S. EPA relying on to determine that NPL previously existed?

U.S. EPA clarification:

Based on the boring log information, the contamination associated with the intervals of stained subsurface soil appears to be residual saturation sorbed to the aquifer materials which can be related to your terminology of "residual NPL". Also based on the physical observations from the well logs, we believe that non-aqueous phase liquid (NPL) previously existed at the site.

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Specifically, the stained soil consisting of sand/sandy clay appears to be mostly associated with vertical intervals at or immediately below the depth to saturation which is where any potential light non-aqueous phase liquids (LNPLs) would typically be found. LNPLs are expected to migrate vertically until residual saturation depletes the liquid or until the capillary fringe is reached. In addition, fluctuations of the water table can result in the movement of the liquid (from LNPLs) further into the subsurface until materials of lower permeability are encountered, such as the clay material found in the upper aquifer. In addition to water fluctuation, it is also possible that some of the contaminants associated with the stained soil may have behaved as dense non-aqueous phase liquids (DNPLs) in which case the liquid would have continued vertical migration under the forces of gravity until it reached some of the clay material of lower permeability found in the upper aquifer. Transport of PCBs may have been facilitated by NLP. Moreover, it is uncertain whether the Pristine pumping system may have had an effect on the NPL.

As further clarification, U.S. EPA believes that the groundwater data from the FI does not indicate the presence of NPL at this time because the concentrations of dissolved organic contaminants in groundwater are not approaching the solubility values for those compounds.

Clarification items:

- What specific contaminants does U.S. EPA believe are being masked by the matrix, and what is causing this masking?
- What samples does the U.S. EPA believe may have experienced this masking?

U.S. EPA clarification:

As shown in the FI Report, the analytical results from subsurface soil samples associated with intervals showing "black staining" or "black discoloration" indicate the presence of low concentrations of polychlorinated biphenyls (PCBs), metals and volatile and semivolatile compounds (VOCs and SVOCs). All organic constituents, specially SVOCs (with polyaromatic hydrocarbons or PAHs) and VOCs can be masked by the matrix. The sorbed material in the soil could bind SVOCs (with PAHs) and VOCs, or possibly degrade them causing a masking of the response. Any samples that were stained with the sorbed material may have experienced this masking.

However, U.S. EPA believes that the soil data obtained using the laboratory methods contained in the Quality Assurance Project Plan are appropriate for soil characterization relevant to the exposure pathways for soil under the BRA. Below, we further clarify some data gaps with respect to transport mechanism affecting exposure pathways not related to soil.

Clarification items:

- Is it the U.S. EPA's conceptual model that PAHs and PCBs could have moved through

the groundwater, but are not detectable in groundwater sampling?

U.S. EPA clarification:

U.S. EPA would like to offer clarification on the above aspect within the context of Section 4.2.1 Sources, Mechanisms of Releases, and Mechanisms of Transport of the Baseline Risk Assessment for the Morton facility. Among other aspects, this section indicates that through leaching (percolation) chemicals present in soil may migrate downward to groundwater and adds that chemicals from the site are believed to have entered the groundwater in the upper aquifer of the site. Also, this section describes the mechanism of groundwater transport as that which allows chemicals present in the upper aquifer beneath the Morton facility to migrate with groundwater toward Mill Creek. Moreover, the mechanism of bioaccumulation is to be considered as per the U.S. EPA's November 25, 2002 comments on the FI Report and BRA. Based on the above, U.S. EPA believes that the transport mechanisms proposed in the BRA for soil and groundwater are to encompass PAHs, PCBs and other organic contaminants potentially associated with the former NPL at the site. U.S. EPA acknowledges that the groundwater sampling results from the FI indicate that a dissolved phase does not appear to be present under current conditions. However, the lack of dissolved phase may represent a late stage in the degradation and/or attenuation of the former NPL where the aquifer system is no longer in equilibrium with respect to the various organic contaminant phases. Therefore, the proposed mechanisms of leaching and groundwater transport are to include PAHs, PCBs and other organic contaminants potentially associated with the former NPL at the site which were likely to have entered the groundwater in the upper aquifer. Similarly, the proposed mechanisms of leaching and groundwater transport need to consider additional aspects further explained below.

Clarification items:

- What additional pathway does the U.S. EPA want Rohm & Haas to investigate with respect to Mill Creek seep and sediments?
- What additional contaminants is the U.S. EPA requesting be added to the seep and sediment sampling parameter list?

U.S. EPA clarification:

In addition to bioaccumulation as per the U.S. EPA's November 25, 2002 comments, the pathways proposed in the BRA are appropriate. With respect to additional seep and sediment sampling, U.S. EPA suggests that Morton follow a phased approach. As an initial step, seep sampling and analysis should be conducted for Appendix IX VOCs, SVOCs, PCBs and pesticides to determine what contaminants are present in the groundwater-surface water interface that may have entered sediments from Mill Creek in accordance with the mechanism of groundwater transport. Those VOC, SVOC, PCB and pesticide analytes that are found at detectable concentrations in seeps based on this initial sampling are to be added to the list of parameters for sediment sampling for Mill Creek. In addition, the additional parameters for

sediment sampling are to include:

a) Compounds that were found at detectable concentrations in seeps based on the results from analysis conducted by Morton and by TechLaw, Inc. on behalf of U.S. EPA and are outside the current list of parameters for sediment sampling. For example, additional sediment sampling parameters should include dichlorobenzenes (detected in seeps) and pesticides (e.g., hexachlorocyclohexane, DDTs, chlordane, endosulfan, and others detected in seeps).

b) Compounds that have been found in the groundwater at the site and have not been previously included in the list of parameters for Mill Creek.

c) Other compounds subject to bioaccumulation as further explained below.

> Table 4-2 of the following document identifies important bioaccumulative contaminants and should be inspected for chemicals that may be associated with the Morton facility:
>
> EPA. 2000. *Bioaccumulation Testing and Interpretation for the Purpose of Sediment Quality Assessment. Status and Needs.* US Environmental Protection Agency. EPA-823-R-00-001. February 2000. http://www.epa.gov/ost/cs/biotesting/
>
> Specific justification should be provided for any excluded chemicals listed in Table 4-2 of EPA (2000).

Moreover, U.S. EPA suggests that, once collected, the seep and sediment data be examined for any potential matrix masking effects to determine if more specialized laboratory methods may be needed.

As further clarification, U.S. EPA believes that there is the possibility that some organic contaminants that may have formerly migrated through groundwater into Mill Creek may no longer be found in seeps because they may have undergone degradation and/or attenuation. However, it is likely that any contamination from those compounds which may have entered the sediments from Mill Creek would have also undergone degradation and/or attenuation and would no longer be of concern, with the exception of bioaccumulative compounds.

Finally, U.S. EPA would like to offer the following suggestion with respect to the mechanism of transport for "Surface Water Runoff" from Section 4.2.1 of Sources, Mechanisms of Releases, and Mechanisms of Transport from the BRA. The status on this mechanism reflects the following: "Sediment samples from Mill Creek were collected and analyzed, which would represent deposition from runoff"." It is suggested that Morton re-evaluate the status on the transport mechanism of surface water runoff to determine if any contaminants present in soil at

the site may have been prematurely screened out from sediment sampling, eliminating further consideration under the mechanism of surface water runoff. We are providing this suggestion in conjunction with the above clarifications to facilitate resolution of any potential data gaps with respect to Mill Creek.

If you have any questions regarding this letter, please contact me at (312) 886-7567 or at "capiro.mirtha@epa.gov".

Sincerely,

Mirtha Capiro
Project Coordinator/Manager
Enforcement and Compliance Assurance Branch

cc: Thomas C. Nash, C-14J
Harold O'Connell, OEPA
Mark Hemingway, Geomatrix Consultants, Inc.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
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CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF

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VIA E-MAIL AND
CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Peter V. Palena
Corporate Remediation Manager
Rohm and Haas Company
P.O. Box 584
Route 413 and State Road
Bristol, Pennsylvania 19007

Re: RCRA § 3013 Administrative Order
Facility Investigation and Request for Additional Work
Morton International, Inc.
U.S. EPA ID No. 000 724 138

Dear Mr. Palena:

The United States Environmental Protection Agency (U.S. EPA) has reviewed and prepared comments on the June 2002 Facility Investigation (FI) Report and Baseline Risk Assessment (BRA), including a Screening Ecological Risk Assessment, for Morton International Inc. (Morton). The report and assessment were submitted by Geomatrix Consultants, Inc. on behalf of Morton pursuant to the requirements of the Administrative Order (AO). The FI Report and BRA are intended to satisfy the requirements from paragraphs 57, 58 and 59 of the AO. As part of the above review, U.S. EPA performed ten percent data verification review of the data validation from the FI. The U.S. EPA comments are enclosed.

Based on the U.S. EPA review of the FI, Morton indicates that much of the on-site contamination may have originated from off site sources, yet the FI does not provide a description of the transport mechanisms to explain the contaminants' presence in the surficial soils and/or soils within the vadose zone beneath the facility. The facility should provide a detailed discussion to support this statement. In addition, our review of the FI determined there are several areas where the full nature and extent of soil and groundwater contamination have not been determined. For the known contamination, the FI does not provide an adequate detailed discussion, including a

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description of the contamination, source or source area, mechanism for transport, potential impact to other media, and horizontal and vertical extent of contamination.

The BRA eliminates several of the contaminants from inclusion in the risk assessment on the basis that they are not facility related and/or are from off-site sources. This is not an acceptable approach and the BRA must be revised to include all data above screening criteria, regardless of origin. Several other issues have been identified with regards to the methodologies employed in the BRA which are outlined in the U.S. EPA comments.

U.S. EPA considers that it would be premature to evaluate the conclusions and summary of findings of the BRA based on the information from the FI. However, the information from the FI Report is sufficient to conclude that contaminated groundwater from the Morton facility is migrating into Mill Creek. Moreover, the information from the FI is sufficient to conclude that the French Drain and Groundwater Collection System may not be adequate in controlling migration of contaminated groundwater from the Morton facility.

U.S. EPA has determined that additional work is necessary pursuant to paragraph 60 of the AO. Specifically, additional investigations are warranted for completing the characterization of the nature and extent of contamination at and from the Morton facility as specified in the U.S. EPA comments and for conducting further evaluation of whether the French drain and management of collected groundwater can be effective means of controlling the migration of contaminated groundwater. Moreover, additional work is necessary to prepare and submit to U.S. EPA electronic copies (formatted according to EPA specifications found at http://www.epa.gov/region5superfund/edman/) of all results of sampling, tests, modeling or other data (including raw data) generated by Respondent during implementation of this AO.

Respondent shall submit for U.S. EPA approval the work plans below for conducting the additional work. The work plans shall include schedules and proposals for progress reports.

- Work Plan for completing characterization of nature and extent of contamination due for submission within thirty (30) days of U.S. EPA's approval of Morton's responses to the U.S. EPA comments. This work plan must address the data gaps identified in the U.S. EPA comments.
- Work Plan for evaluation of French drain and management of collected groundwater.
- Work Plan for preparing electronic copies of all results of sampling, tests, modeling or other data from the FI and the additional work.

As specified in paragraph 58 of the AO, the information from the above workplans and progress reports shall be appropriate to: (1) to characterize the potential pathways of migration of hazardous waste and hazardous waste constituents; (2) characterize the sources of hazardous waste and/or hazardous waste constituent contamination; (3) define the degree and extent of hazardous waste and/or hazardous constituent contamination; and (4) identify actual or potential receptors.

Please contact me within fifteen (15) days of receipt of this letter to agree on a time to discuss the schedule for submittal of the Morton's responses to the U.S. EPA comments and the work plans for additional work in accordance with this letter. Pursuant to paragraph 60 of the AO, Morton has the opportunity to meet or confer with U.S. EPA to discuss the above additional work within fifteen (15) days after the receipt of this letter.

To agree on a time for discussion or if you have any questions regarding this letter, please contact me at (312) 886-7567 or at "capiro.mirtha@epa.gov".

Sincerely,

Mirtha Capiro
Project Coordinator/Manager
Enforcement and Compliance Assurance Branch

Enclosure

cc w/ enclosure: Thomas C. Nash, C-14J
Harold O'Connell, OEPA
Mark Hemingway, Geomatrix Consultants, Inc.

COMMENTS FROM THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (U.S. EPA) ON THE JUNE 2002 FACILITY INVESTIGATION REPORT, JUNE 2002 BASELINE RISK ASSESSMENT, AND TEN PERCENT DATA VERIFICATION REVIEW OF THE DATA VALIDATION

MORTON INTERNATIONAL, INC. (Morton)
READING, OHIO

JUNE 2002 FACILITY INVESTIGATION REPORT

I. GENERAL COMMENTS

1. The data and analysis provided in June 2002 Facility Investigation (FI) Report are helpful in addressing many of the informational needs identified for the Morton Reading facility and in meeting the objectives of the investigation specified in the Administrative Order. However, a number of issues and concerns have been identified regarding the investigation and the conclusions that can be drawn from these investigations. These issues and concerns are identified in the following Specific Comments.

2. The FI Report indicates (Sections 2, 5, and 7) that many of the contaminants detected in the shallow soils on the site may be the result of off-site sources. Specifically, the following compounds are believed to have originated from off-site sources:

   - Chloroethenes, chloroethanes, and chloroform;
   - PAHs;
   - PCBs;
   - Pesticides and herbicides; and
   - Certain metals (aluminum, barium, and vanadium).

   The FI Report should provide a comprehensive list of contaminants detected during the FI which are likely attributable to an off-site source(s), and a detailed discussion of the transport mechanisms which would explain the contaminants' presence in the shallow soils of the site. In addition, the FI Report should include a discussion of the contaminants which are attributable to past and present operations at the Morton facility. Contaminants which are attributable to the Morton facility or are common to both the Morton facility and potential off-site sources should be addressed in future investigative/remedial activities conducted by the Morton Facility.

3. The information from the FI Report is sufficient to conclude that contaminated groundwater from the Morton facility is migrating into Mill Creek. Moreover, the information from the FI is sufficient to conclude that the French Drain and Groundwater Collection System may not be adequate in controlling migration of contaminated groundwater from the Morton facility. Further investigations are necessary to evaluate

whether the French drain and management of collected groundwater can be effective means of controlling the migration of contaminated groundwater.

II SPECIFIC COMMENTS

Section 2.4.2.1 The Pristine Superfund Site, page 7

1. The FI Report states that a 1992 assessment by a U.S. EPA contractor identified elevated metals and semi-volatile organic compounds (SVOCs) in the surface soil at the northeast corner of the Morton facility near the Pristine boundary. Furthermore, this assessment concluded that the results indicate that some of the contaminants in the surface soils at the Morton facility could have originated from off site sources. However, a review of Figure 2-7 of the facility's Current Conditions Report (September 2000) indicates that there is a drainage ditch between the Morton facility and the Pristine site. This drainage ditch would appear to preclude the transport via surface runoff of contaminants on the Pristine site to the Morton site. Thus, to support the statement that surface soil contamination could be from off site sources, the FI Report should include a detailed description of the transport mechanisms which would explain the contaminants' presence in the surficial soils near the Pristine boundary. To further support the above statement, the FI Report should discuss the presence or absence of potential sources of on-site contamination based on information regarding industrial processes associated with each building from the Morton facility.

Section 5.1.1 Upper Aquifer, page 44

2. When discussing the response to water levels in the Upper Aquifer (UA) during the termination and restart of the Pristine pumping system, the FI Report (p. 44) indicates that the referenced water level response data is provided in Appendix C. However, Appendix C does not contain the referenced water level data. In addition, when identifying the three shallow UA sand wells monitored during termination of the Pristine pumping system, the FI Report (p. 44) identified well UAW17-20. No such well appears to exist; the correct well appears to be UAW17-40. The FI Report should be revised to include plots of the water level data recorded during the termination and restart of the Pristine pumping system and to correctly identify all monitored wells during the test.

3. When discussing the response of the water levels in the three shallow UA sand wells during the termination and restart of the Pristine pumping system, the FI Report (p. 14) indicates that "unlike the deeper Upper Aquifer wells nearby, water levels in these shallow wells did not exhibit any clear response to the pumping system." These data are used to support the conclusion that "the Shallow UA Sand appears to be generally isolated hydraulically from both deeper Upper Aquifer Sands and the Lower Aquifer." However, inspection of the data plots presented in the Third Quarter (July - September 2001) Progress Report for Facility Investigation for the response to the UA wells

indicates that while they may be significantly damped and/or delayed relative to those observed in deeper UA wells, responses may have been observed in the UA wells. The plots of the water levels in these wells indicate a general increase in water level consistent with the increases observed in the deeper wells.

No analysis of the potential response in the UA wells to the ten-day cessation of pumping in the Pristine system has been presented. Given the intervening low permeability deposits and the significant downward gradient observed between the shallow and deeper UA sands, it appears reasonable to observe some lag and damping of the responses observed between the shallow and deep sands. It is also unclear that the test period was of sufficient duration for the full response to develop in the upper sands. In addition, no indication was provided as to whether pumping from the upper aquifer extraction system at the Pristine site was simultaneously terminated with that from the deeper system. If this were so, some accounting of the impact of the shallow system may be necessary.

These tests, by themselves, do not appear sufficient to conclude that the shallow UA sand appears to be generally isolated hydraulically from both deeper UA sands and the Lower Aquifer. In fact, as acknowledged elsewhere in the FI Report (p. 47), the shallow and deep UA sands do not appear hydraulically isolated based on chemical evidence.

Section 5.3 Chemical Impact to Environmental Media, pages 54, 55, 56, and 57

Shallow UA Sand

4. When discussing the highest level of constituents that may be derived from historical releases at the Morton Facility, the FI Report (p. 54) indicates that "most of these constituents, with the possible exception of ketones and certain inorganics, are not present at concentrations consistent with recent release or highly concentrated localized source areas (i.e., "hot spots")." However, examination of the groundwater quality data for VOCs on Figure 5-17 appears to indicate otherwise.

   At monitoring well UAW04-20, a toluene concentration of 21,000 μg/l was measured in the shallow UA sands on May 7, 2001. Such levels of toluene appear consistent with a highly concentrated localized source. In fact, the nature, extent, and potential source of this significant toluene contamination does not appear to have been adequately identified.

   While low levels of chlorobenzene are found throughout the site, significant levels of this constituent has been identified in the northwest corner of the site in monitoring well MW-EPA-1. Chlorobenzene levels as high as 3,200 μg/l have been reported in MW-EPA-1. Similarly, toluene levels as high as 1,400 μg/l have been reported for the nearby well UAW08-20. These groundwater concentrations could reasonably be classified as hot spots, consistent with a localized, nearby source. However, such a source has not been identified in the text of the FI Report.

5. The FI Report (p. 55) indicates that "the extent of groundwater impact in the Shallow UA Sand has generally been delineated by the FI Sampling." However, the localized areas of toluene contamination at UAW08-20 and, particularly, at UAW04-20 have not been well delineated; nor have source areas for these contaminants been identified. Similarly, the localized area of high chlorobenzene contamination at MW-EPA-1 has not been well delineated; nor has the source area for this release been identified.

   Moreover, it is not clear that the impact on shallow groundwater by potential releases from the combined sewer has been fully characterized. As indicated on Figure 5-25, the sewer survey has identified multiple points of likely release from the sewer which extends throughout the facility. A detailed discussion demonstrating how the potential impact on groundwater from each of these potential release points has been identified and delineated should be provided. Morton shall address any identified data gaps.

Deep UA Sand

6. When discussing potential contaminant migration patterns in the deep UA sands, the FI Report (p. 56) indicates that "assuming groundwater flow within these zones is predominately to the south along the natural regional gradients for the lower aquifer, then wells along the southern fenceline would be downgradient of potential on-site source areas." However, the groundwater gradient maps presented in Figures 5-1 and 5-2 indicate that flow in the deep UA sands is either west to east or east to west depending on the location within the sand. While the water level data may suggest that groundwater migrates to the center of the facility and then southward, this interpretation is not clearly established by the water level data. Moreover, water level data have been taken from a variety of depths within the deep UA sands, and due to the strong vertical gradients observed in the Upper Aquifer, these water level data may not provide an adequate basis for determining flow directions with the deep UA sands.

   Since a strong hydraulic connection between the deep UA sands and Lower Aquifer has been established, flow directions in the deep UA sands are likely to be heavily influenced by the north-south line of extraction wells installed to control the Pristine contaminant plume. Thus, it may not be appropriate to consider the monitoring wells along the southern boundary as downgradient from the source areas on the Morton site. Rather, given the apparent easterly migration of contaminants from the northwest and west central area of the site toward the area of UAW15-50, it would appear that monitoring locations in the eastern portion of the site would provide a better indication of the downgradient impacts in the deep UA sands.

Lower Aquifer

7. The FI Report (p. 57) indicates that to resolve U.S. EPA concerns regarding the potential impact of contaminant releases from the Morton site on the Lower Aquifer, multiple Lower Aquifer wells were installed in the northwestern portion of the Morton facility. This area was selected for several reasons, including because it was the area of the former impoundments where significant amounts of water were managed and because it is an area where the Lower Aquifer is shallower than in any other portions of the Morton Facility. No impact was observed in these additional wells. Based on these results, it has been concluded that there are no impacts on the Lower Aquifer from historical or current Morton facility operations.

   However, additional data collected during the FI strongly suggest that historical or current Morton facility operations may be impacting the Lower Aquifer. The FI Report (p. 56) has acknowledged the potential impact from contamination in the shallow UA sands in the west-central and northwest portions of the Morton facility on the deep UA sands at UAW15-50. The response of water levels in UAW15-50 to the termination and restart of pumping from the Pristine extraction system demonstrated a strong hydraulic connection between the deep UA sands at UAW15-20 and the Lower Aquifer. Consequently, given the gradients created by the Pristine extraction system, it must be concluded that it is likely that the contaminants migrating to the deep UA sands at UAW15-50 from the west-central and northwest portions of the Morton facility are migrating further into the Lower Aquifer. The monitoring wells installed into the Lower Aquifer in the northwest portion of the facility are not positioned to detect these potential releases to the Lower Aquifer. Monitoring wells located in the eastern portions of the facility would be required for this purpose. It appears that additional monitoring in these areas may be necessary to confirm that historical or current Morton facility operations are not impacting the Lower Aquifer.

Section 5.3.1 Soils, page 50

8. Several shallow soil samples (UAW14-10-1.5' and UAW17-40-1.5') were collected near Buildings 12, 19, 26, and 27 during the FI. The Current Conditions Report (September 2000) indicates that limited soil removal in this same general area was completed between 1976 and 1978 due to leaking aqueous tin chloride transfer piping, drum storage, line washing operations, and spills. The Current Conditions Report also indicates that the soil was replaced.

   The FI Report should include a description of the areas where soil was removed and replaced near Buildings 12, 19, 26, and 27 and how these areas may or may not correlate with the locations of UAW14-10-1.5' and UAW17-40-1.5'.

9. The analytical results of the soil sampling are presented on Figures 5-13 through 5-16 and on the summary Tables 5-2 through 5-5. Table 4-2 provides a list of all soil samples and

the target analyte lists for which these samples were analyzed. However, inspection of Tables 5-2 through 5-5 indicate that the results for all of the analytes identified on Table 4-2 are not presented on Tables 5-2 through 5-5. For example, Table 4-2 indicates that soil samples were take for Appendix IX analysis at Direct Push locations DP-31, DP-36, DP-37, DP-38. However, no analytical results for these locations have been presented on Tables 5-2 through 5-5. Data for these locations are similarly not provided on Figures F-13 through 5-16. No data set other than these tables and figures have been provided in the FI Report, including in the Appendices. Concentrations for all detected constituents should be provided on the summary table. A complete data set should be provided in the Appendices or in an attached CD.

10. The first paragraph on page 50 states "....many of the observed constituents may have originated from off-site sources (see Section 2.3.2)." However, the FI Report does not provide a description of the transport mechanisms which would explain the contaminants' presence in the surficial soils and soils within the vadose zone beneath the facility.

    The FI Report should include a detailed discussion of the transport mechanisms which would explain the contaminants' presence in the shallow soils of the site and support the statement that many of the observed constituents may have originated from off-site sources. To further support the above, the FI Report should discuss the presence or absence of potential sources of on-site contamination based on information regarding industrial processes associated with each building from the Morton facility.

11. The areas of note that were identified in the text of Section 5.3.1 of the FI Report did not include the high toluene concentrations (160 mg/kg) detected in sample UAW04-20-10'. Groundwater samples at this location also indicate significant groundwater contamination. The full nature and extent of the toluene contamination in this area has not been well determined.

    The areas of note that were identified in Section 5.3.1 also did not include the area surrounding monitoring well UAW17-40. Monitoring well UAW17-40 was installed near the southeast corner of the facility property near Buildings 26 and 27. During the installation of the well, shallow soil samples (UAW17-40-1.5' and UAW17-40-5') were collected and analyzed for VOCs, SVOCs, PCBs/pesticides, and metals. Results of these analyses indicate elevated concentrations of VOCs, SVOCs, PCBs/pesticides, and metals (particularly lead). However, the FI Report does not address these results.

    The FI Report should provide a detailed discussion of the contaminants detected in the shallow soil during the installation of UAW17-40. The discussion should include a description of the source of this contamination, the mechanism for its transport (if it is believed to have originated off site), and the horizontal and vertical extent of contamination should be delineated.

12. The FI Report also fails to discuss the potential impact to soils resulting from leaks in the combined sewer system. As indicated on Figure 5-25, the sewer survey has identified multiple points of likely release areas or points from the sewer which extends throughout the facility. A detailed discussion demonstrating how the potential impact on soils from each of these potential release points has been identified and delineated should be provided.

The Former Surface Impoundments (SWMU 1)

13. The FI Report acknowledges that contamination likely attributable to the facility was identified at the former surface impoundments. However, the FI Report does not discuss the potential impact of the identified soil contamination or the adequacy of the available data for fully characterizing releases at the impoundments. The soil data clearly indicate significantly elevated levels of toluene at the surface impoundments, with toluene levels as high as 150 mg/kg found in DP16-12.8. Toluene contamination in groundwater has been observed in nearby levels, including 1,400 ug/l of toluene in nearby monitoring well UAW08-20. These data appear to indicate potentially significant releases that may require remediation. However, each surface impoundment was investigated using only a single direct push boring with two soil samples taken from each boring, one taken at the surface and a second at a depth of 10 to 12 feet. Given the data that potentially significant releases have occurred at the surface impoundments, the currently available data do not appear to characterize fully the soil contamination in the vicinity of the former surface impoundments sufficiently to define maximum contaminant levels, the full extent of contaminant, and to allow assessment of the potential risk posed by the releases.

The T-1 Area (Trench T-1)

14. The FI Report (pg. 50-51) acknowledges that "soils in the vicinity of these drums (found in drum disposal site in the T-1 Area) exhibited elevated levels of metals, particularly tin, arsenic, chromium and lead." These levels were as high as 580 mg/kg of arsenic, 232 mg/kg of chromium, and 19,300 mg/kg of lead. The FI Report (pg. 51) further states that "subsequent DPT sampling of the areas, in addition to sampling in other nearby trenches, has confirmed that elevated metals levels are confined to the immediate area of the former drum location." However, it does not appear that groundwater within or immediately downgradient from the T-1 area has been sampled. Consequently, it has not been determined if these high levels of metals contamination are impacting groundwater. Groundwater sampling in the area immediately downgradient from the T-1 area should be performed.

Section 5.4 Summary of Baseline Risk Assessment Findings, page 61

15. Evaluation of the FI Report summary of the baseline risk assessment is not possible until the resolution of the technical review comments on the baseline risk assessment.

Section 6.0 Completion of Investigation Objectives, page 69

16. A determination that the FI has met the stated objectives of the investigation can be accomplished only after the issue and concerns identified regarding the investigation and associated risk assessment have been resolved.

Section 7.0 Conclusions, page 77

17. Evaluation of the final conclusions of the study is not possible until the issues and concerns that have been identified regarding the investigation and associated risk assessment have been resolved.

JUNE 2002 BASELINE RISK ASSESSMENT

I. GENERAL COMMENTS

1. In the June 2002 Morton International, Inc. Baseline Risk Assessment (BRA), the procedure to screen the list of detected compounds to select constituents of potential concern (COPCs) for evaluating the Human Health Risk Assessment (HHRA), does not follow recent guidance related to inclusion of naturally occurring and anthropogenic background contamination. Per U.S. EPA's 1989 Risk Assessment Guidance for Superfund (RAGS), the use of background data is acceptable for evaluating inorganic analytes only, but organic compounds cannot be screened out based on background concentrations. Additionally, as outlined in more recent U.S. EPA Superfund guidance, *Role of Background in CERCLA Cleanup Program* (OSWER 9285.6-07P, May 1, 2002), U.S. EPA has established a policy that the BRA retain constituents that exceed risk-based screening concentrations, regardless of whether or not those constituents are believed to be from background sources. This enables the risk manager to have a more complete picture of the risks associated with hazardous substances, pollutants and contaminants present at the site.

   At a minimum, Morton should discuss elevated background concentrations of COPCs and their specific contribution to site risks. In light of this new policy, all COPCs that were originally excluded from the BRA, on the basis that they are naturally occurring or believed to be anthropogenic background constituents, should be included in the risk assessment. This is particularly important for assessing cumulative risks. Regardless of the origin of contamination, the COPCs are contaminants available for exposure and will contribute to the overall cumulative risks at the site. Thus, they can not be neglected in a BRA.

   Additionally, in a January 23, 2002 meeting with Rohm and Haas, U.S. EPA discussed and approved Morton's background sampling locations; however, there was no discussion

or agreement on how these background data may be used. U.S. EPA requested that a letter summarizing the approach on the use of background data be submitted to U.S. EPA for review and comment prior to preparation of the final report. It should be noted that this was never submitted to U.S. EPA; thus, this is the first time U.S. EPA is reviewing the use of background data.

2. The Screening Ecological Risk Assessment (SERA) also eliminates compounds that are below background. As discussed above, background data cannot be used to screen out COPCs in a SERA. Both the HHRA and SERA should be revised accordingly.

3. It is not appropriate to eliminate chemicals as COPCs if they are presumed not to be associated with Morton facility releases. A BRA must consider all contaminants present at the site, regardless of their origin, because they will contribute to the overall cumulative risk at the site (also see General Comment 1). A discussion of those non-site related COPCs in the HHRA and SERA can be further examined as part of the Risk Characterization and Uncertainty Analysis regarding site risks. Per General Comment 1, all COPCs, regardless of origin, must be considered in the risk assessment.

4. Although the approved FI Work Plan (Morton, 2000) indicates that the federal maximum contaminant levels (MCLs) or the U.S. EPA Region 9 preliminary remediation goals (PRGs) for tap water if an MCL is not available, will be used to screen groundwater and surface water data to select COPCs, the MCLs are not entirely appropriate. Previous review comments on the FI Work Plan (Morton, 2000) requested that Morton demonstrate the appropriateness of any PRGs and risk-based screening levels (RBSLs) used to identify COPCs in the HHRA. This information is missing from the BRA report. MCLs are more appropriately applied to select cleanup levels because it is not generally U.S. EPA's position that groundwater or surface water be remediated beyond MCLs unless more stringent levels are appropriate for ecosystem protection. Additionally, MCLs are not exclusively derived using risk-based criteria that consider multiple exposure pathways. While it would be acceptable to use the MCL to select a COPC when the MCL is more conservative than its corresponding risk-based screening level, the risk-based criterion must be used as the screening level when it is lower than the MCL. Thus, the U.S. EPA Region 9 PRG for tap water should be applied as the RBSL where it is more conservative than the MCL.

5. It should be noted that the U.S. EPA Region 9 PRGs were updated in October 2002. This update is a major revision from the previous version, and contains several changes to the toxicity values. In addition, the updated PRG table was reviewed by the National Center for Environmental Assessment (NCEA) and is the only published source of the latest NCEA provisional toxicity values for certain constituents. Thus, Morton should use this updated version of the PRGs in the revised risk assessment to ensure that the latest toxicological information and screening values are applied.

6. The BRA indicates that constituents detected in fewer than five percent of samples were excluded as COPCs on the basis that their infrequent detection makes them insignificant sources of exposure. However, the risk assessment does not address the potential for the existence of hot-spots (i.e., localized areas of high contamination). The BRA should evaluate whether there is any pattern to the infrequently detected constituents (e.g., whether or not they are generally co-located) and whether the infrequently detected constituents correspond to the location of high detections of other constituents that are included as COPCs.

7. The BRA relies on the use of industrial soil screening criteria because the site is anticipated to be used for industrial purposes into the foreseeable future. U.S. EPA Region 5 policy outlined in *Use of Institutional Controls in the RCRA Corrective Action Program* (www.epa.gov/reg5rcra/ca) describes information that should be discussed in regard to land use determinations. Former review comments on the FI Work Plan (Morton, 2000) requested that this information be included in the HHRA. This information is missing from the BRA. Sources of information about current land use restrictions and future land use expectations should explicitly include a discussion of zoning laws and maps, consultation with local planning authorities, and assessment of property development trends in the vicinity of the facility. U.S. EPA has also specifically cautioned against automatically assuming restricted future land use assumptions on the basis of extrapolation of current land use and relying on current zoning/industrial use codes [55 Federal Register 19452; May 1, 1996]. The BRA should provide a more detailed discussion of the decision to assume industrial land use in screening for COPCs and to select only on-site industrial exposure scenarios and exposure pathways.

8. The BRA indicates (Section 4.1.2, page 17) that the Upper Aquifer is not known to be used as a source of potable water. The text also states that although the lower portion of the Lower Aquifer is widely used as a source of potable water, there are no known active supply wells at or in the immediate vicinity of the Morton Facility. The BRA also indicates that the Lower Aquifer groundwater is being controlled by the remediation system for the neighboring Pristine Superfund site. Thus, Morton does not evaluate groundwater as a potable water source in the BRA.

   It is noted that Morton does not have in place appropriate institutional controls to restrict current and future groundwater use on site. In addition, Morton does not have any control over groundwater use in off-site areas. It is also noted that any consideration of the remediation system for the neighboring Pristine Superfund site is to be included as a risk management activity, the impact of which should be assessed independent of, and following, a human health and ecological risk assessment. Therefore, Morton should revise the risk assessment to consider this exposure pathway and include the potential for groundwater to be used as a source of potable water.

9. With respect to chromium, the BRA assumes that all exposures reflect the less toxic

trivalent form of chromium. None of the text discussion or the data summary tables indicate that chromium speciation was performed during the analyses of site samples. Without speciation information, it is common practice in risk assessment (and a more conservative assumption) to presume that chromium detections are present in the more toxic hexavalent form. The BRA should be revised to provide evidence that all chromium is present in the trivalent state, or the risk calculations should be re-run using hexavalent chromium chemical parameters and toxicity criteria.

10. The SERA, Section 7 of the BRA, is not acceptable because it does not adequately follow current U.S. EPA ecological risk assessment guidance (i.e., EPA, 1997; EPA, 2001a, 2001b) and there are inconsistencies with the FI Work Plan (Morton, 2000). Key deficiencies include (1) some likely complete pathways are omitted; (2) contaminants of potential concern are inappropriately screened out because they are not detected, do not have screening values, or are below selected background concentrations; and (3) food chain risks to wildlife are not assessed.

11. In general, the SERA cites older risk assessment guidance. As noted in the Specific Comments below, the SERA should cite and follow current U.S. EPA national ecological risk assessment guidelines.

II. SPECIFIC COMMENTS

Section 1.2 Approach, page 1

1. In addition to the guidance documents listed on page 2, Morton should also cite and follow U.S. EPA's current ecological risk assessment guidance documents, which are listed under "Literature Cited" attached at the end of these comments (EPA, 1997; 1998; 2001a; and 2001b). Two of these documents (EPA, 1997; 1998) are cited in the FI Work Plan (Morton, 2000; Section 6, p. 1) but are not included in the Approach Section of the SERA. Please include all appropriate risk assessment guidance.

Section 2.1 Site History, page 3

2. Page 4 lists some of the materials and chemicals used or produced on site, but a comprehensive list and description has not been provided. For example, Morton should elaborate on the components of the anti-stripping agents noted in the second bullet. Only a few volatile organic compounds (VOCs) are listed on page 4, which does not include some of the compounds noted to be groundwater and soil contaminants at the site (e.g., 13 soil VOCs are noted on p. 7). It is unclear whether site activities may have released polynuclear aromatic hydrocarbons (PAHs) through combustion processes or petroleum spills. It is also unclear if polychlorinated biphenyls (PCBs) may have been released. Page 8 shows that PCBs were detected in groundwater at 0.13 mg/L, which is near the

solubility limit for Aroclor 1242 (0.24 mg/L; Eisler, 1986). Morton should provide a more complete description of compounds used, produced, and potentially released on site. This discussion should be consistent with the compounds actually detected in site media, and should note possible sources of contaminants (e.g., PCBs) that may not be explained by known site activities.

Section 2.4.3 Surface Water/Seeps, page 9

3. Page 9 discusses contaminants measured in two seeps along the Mill Creek bank. It is unclear why data for only two seeps are provided, when the report indicates there are additional seeps. Groundwater contamination may be heterogeneous at the site (e.g., PCB contamination may be localized); thus, it is unclear if the contaminant data for only two seeps are adequate to describe releases to surface water. Morton should provide all available data on the seeps and provide justification for the data used in the HHRA and SERA. Additionally, seep discharges should be discussed in the SERA, including approximate locations and flows.

Section 2.4.4 Sediment, page 9

4. Page 9 states that 20 sediment samples were analyzed for potential contaminants, but only one sample was analyzed for semivolatile organic compounds(SVOCs). SVOCs would be expected to accumulate in sediment to a greater degree than volatile constituents. This particular sample contains multiple PAHs that exceed screening values (e.g., Table 10.2). This section should include justification for only analyzing SVOCs at one location and why that specific location was selected. Morton shall address any identified data gaps.

Section 3.2 Selection of Chemicals of Potential Concern, page 11

5. Previous review comments on the FI Work Plan (Morton, 2000) required Morton to provide a discussion on procedures that are used to calculate PRGs or risk-based screening levels for those compounds that do not have sufficient toxicity data. There are several compounds for which surrogate risk-based screening levels adopted from other compounds are used for screening. The BRA does not include a discussion supporting the use of surrogate values adopted from other compounds. The BRA should be revised to include a discussion on the appropriateness of using these surrogate values for screening.

Section 3.2.1 Soil, page 12

6. Several organic constituents, including PAHs and pesticides, are excluded from the HHRA on the basis that they are not site-related, implying that unspecified off-site anthropogenic sources are responsible for certain constituents detected at the Morton facility. Per the general comments provided herein, contaminants cannot be eliminated from a BRA on the basis that they are non-site related. Rather, they must be included in the quantitative risk

assessment, but then may be qualitatively discussed in the Risk Characterization and Uncertainty sections of the report. The BRA should be revised accordingly.

7. Dieldrin should not have been eliminated from the HHRA on the basis of a comparison with its background concentration, as indicated in Table 1.1 of the BRA. In accordance with U.S. EPA's May 2002 *Role of Background in the CERCLA Cleanup Program*, dieldrin should be retained as a COPC because it exceeds its risk-based screening level. The magnitude of the dieldrin soil risk and its background source(s) should then be explicitly discussed in the risk characterization portion of the assessment.

8. Similarly, benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene should not have been eliminated from the HHRA on the basis that there no known site-related historical use associated with these PAHs. These three PAHs should be retained as soil COPCs because their concentrations exceed risk-based screening levels as shown in Table 1.1 of the report.

9. The following corrections to the soil screening criteria should be made in Table 1.1:

- The more conservative water quality protection criterion of 0.4 mg/kg should be used for cis-1,2-dichloroethene;
- The more conservative water quality protection criterion of 0.6 mg/kg should be used for carbazole;
- The water quality protection criterion for endosulfan (which is also used as a surrogate for endosulfan sulfate) should be 18 mg/kg, not 180 mg/kg as shown;
- The more conservative industrial PRG of 35 mg/kg should be used for cyanide;
- The residential soil PRG has been used for manganese whereas the industrial soil PRG has been used for other constituents in Table 1.1.

Section 3.2.2 Groundwater, page 14

10. Several constituents are eliminated as COPCs on the basis that they are not site-related. Per the general comments provided herein, contaminants cannot be eliminated from a baseline risk assessment on the basis that they are non-site related. Rather, they must be included in the quantitative risk assessment, but then may be qualitatively discussed in the Risk Characterization and Uncertainty sections of the report. The BRA should be revised accordingly.

11. A review of Table 1.2 indicates that the constituents 1,2-dichloroethane, tetrachloroethene, 1,1,2-trichloroethene, vinyl chloride, Arochlor 1242, alpha-BHC, beta-BHC, delta-BHC, alpha-chlordane, dieldrin, heptachlor, and heptachlor epoxide should not have been eliminated as COPCs from the HHRA on the basis that they have no known site-related history. The BRA should be revised to quantitatively evaluate these COPCs. A qualitative explanation for why these constituents are not believed to be site-related may

be discussed in the Risk Characterization and Uncertainty sections of the report. The BRA should be revised accordingly.

12. Vinyl chloride is also eliminated on the basis that it is infrequently detected. However, the detection limits for all the vinyl chloride samples range from 2 to 2000 μg/L, which significantly exceed the risk-based screening level (Region 9 PRG) of 0.02 μg/L. Vinyl chloride is also typically associated with the other chlorinated chemicals that have been detected on site. For all these reasons, vinyl chloride should be retained as a COPC in groundwater.

13. For several constituents, MCLs that are less conservative than their respective risk-based screening levels have been inappropriately used in Table 1.2 to screen COPCs. All contaminants should be re-screened using the more conservative of the MCL or U.S. EPA Region 9 PRG. Revise the HHRA accordingly.

Section 3.2.3 Surface Water, page 14

14. A review of Table 1.3 indicates that the constituents beta-BHC, dieldrin, and heptachlor epoxide should not have been eliminated as COPCs from the HHRA on the basis that they have no known site-related history. Per the general comments provided herein, contaminants cannot be eliminated from a baseline risk assessment on the basis that they are non-site related. Rather, they must be included in the quantitative risk assessment, but then may be qualitatively discussed in the Risk Characterization and Uncertainty sections of the report. The BRA should be revised accordingly.

15. For several constituents, MCLs that are less conservative than their respective risk-based screening levels have been inappropriately used in Table 1.3 to screen COPCs. All contaminants should be re-screened using the more conservative of the MCL or U.S. EPA Region 9 PRG. Revise the HHRA accordingly.

Section 3.2.4 Sediment, page 15

16. A review of Table 1.4 indicates that the constituents benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, and beta-BHC should not have been eliminated as COPCs from the HHRA on the basis that they have no known site-related history. Per the general comments provided herein, contaminants cannot be eliminated from a BRA on the basis that they are non-site related. Rather, they must be included in the quantitative risk assessment, but then may be qualitatively discussed in the Risk Characterization and Uncertainty sections of the report. The BRA should be revised accordingly.

17. Table 1.4 indicates that arsenic and thallium were eliminated as COPCs on the basis that on-site concentrations did not exceed background levels. The BRA should be revised to

quantitatively evaluate these COPCs. A qualitative discussion for why these contaminants are not believed to be site-related may be discussed in the Risk Characterization and Uncertainty sections of the report. The BRA should be revised accordingly.

Section 4.1.2 Land and Water Use, page 17

18. Previous review comments submitted on the FI Work Plan (Morton, 2000) required that additional specific information to be provided on the constituents in groundwater associated with the Morton facility and the ability of the neighboring Pristine Superfund site remediation system to control COPCs from the Morton facility. Previous review comments also asked for a determination of whether Morton COPCs in the upper aquifer had reached the lower aquifer, and if so, to include exposures associated with domestic use of groundwater. In response to the previous review, Morton assured that they would provide a determination of whether the lower aquifer had been impacted by Morton site COPCs, along with any necessary evaluations as to the effectiveness of the neighboring Pristine Superfund site in controlling Morton COPCs. This required information and evaluation is missing from the BRA report. Revise the document to specifically address the concerns that were brought up in the FI Work Plan review regarding the potential for Morton COPCs to impact potential domestic uses of groundwater.

19. Previous comments on the FI Work Plan (Morton, 2000) specifically requested that the BRA report include information regarding studies performed to conclude that the upper aquifer does not serve as a source of drinking water. Morton agreed to provide references to studies already performed in the section discussing land and water use. This information is missing in the report. Revise the BRA to include the requested information.

20. The text indicates that the Upper Aquifer is not known to be used as a source of potable water, and that although the lower portion of the Lower Aquifer is widely used as a source of potable water, there are no known active supply wells at or in the immediate vicinity of the Morton Facility. The BRA also indicates that the Lower Aquifer groundwater is being controlled by the remediation system for the neighboring Pristine Superfund site. Thus, Morton does not evaluate groundwater as a potable water source in the BRA.

    It is noted that Morton does not have in place appropriate institutional controls to restrict current and future groundwater use on site. In addition, Morton does not have any control over groundwater use in off-site areas. It is also noted that any consideration of the remediation system for the neighboring Pristine Superfund site is to be included as a risk management activity, the impact of which should be assessed independent of, and following, a human health and ecological risk assessment. Therefore, Morton should revise the risk assessment to consider this exposure pathway and include the potential for groundwater to be used as a source of potable water.

Section 4.2.1 Sources, Mechanisms of Releases, and Mechanisms of Transport, pages 19

and 20

21. The HHRA addresses only the generation of windborne fugitive dusts. Additional dusts that would be generated by construction or excavation activities are not modeled, although page 21 of the BRA states that construction activity dust generation is addressed. Explain why the methodology used to calculate a specific construction particulate emission factor (PEF) that would be relevant to construction workers outlined in U.S. EPA's *Supplemental Guidance for Developing Soil Screening Levels at Superfund Sites* (OSWER Directive 9355.4-24, March 2001) was not used. The BRA cites this document in Tables 4-1 through 4-10. (Note that this document is missing from the references list in Section 9.0 of the report.)

22. The decision to exclude potential exposure to contaminated fish through bioaccumulation of constituents in surface water and sediment should be revisited in light of the fact that many additional organic constituents should be retained as COPCs since they exceed risk-based screening criteria. Additionally, the lack of fish noted during the field visit conducted at the facility is not sufficient reason to exclude fish tissue exposures. The potential for Mill Creek to serve as a fishing source currently and in the future should be discussed in further detail. See Specific Comment 40.

23. With respect to biota exposures, identify the criteria that are used to determine which constituents present a potential to bioaccumulate.

Section 4.3.1 Exposure Point Concentrations, page 22

24. Previous review comments on the FI Work Plan (Morton, 2000) required that improper references to the document cited as EPA 1992a would be removed and replaced with proper references to U.S. EPA's *Supplemental Guidance to RAGS: Calculating the Concentration Term*. Although Morton agreed to correct the referencing errors, the BRA continues to include the improper references. Revise the document accordingly.

Section 4.3.1.3 Surface Water, page 24

25. Table 3.3 presents dissolved concentrations of inorganic constituents used to generate exposure point concentrations (EPC) for surface water. However, to evaluate surface water exposures from incidental ingestion during recreation use (e.g., swimming, wading), it is not expected that surface water would be filtered. Rather, total (unfiltered) concentrations would be more representative of actual exposure conditions and should therefore be used to calculate EPCs for this exposure pathway. Morton should discuss this issue in detail, including the impact of using filtered versus unfiltered data on the risk assessment. This may also be addressed as part of the uncertainty analysis in the risk assessment.

Section 4.3.1.5 Ambient Air, page 25

26. Section 4.3.1.5 identifies U.S. EPA's 2001 RAGS Part E, Draft Dermal Guidance, as the source of the particulate emission factor (PEF) model. The dermal exposure guidance does not include an evaluation of particulate emissions. The proper document reference should be provided.

Section 4.3.2 Exposure Equations, page 25

27. The equations for calculating dermal exposure dose from soil contact are stated to be taken from U.S. EPA's *RAGS, Part E: Supplemental Guidance for Dermal Risk Assessment* (OSWER Directive 9285.7-01e, September 2001). However, none of the soil dermal exposure equations in Tables 4.1 through 4.10 include a required parameter ABS_d (dermal absorption fraction). This means that the dermal risks from soil exposure may not have been correctly calculated in the BRA. Revise the risk assessment accordingly.

28. The equations for calculating dermal exposure dose from water contact are stated to be taken from U.S. EPA's *RAGS, Part E: Supplemental Guidance for Dermal Risk Assessment* (OSWER Directive 9285.7-01e, September 2001). However, some of the water dermal exposure equations in Tables 4.1 through 4.10 and dermal exposure tables in Appendix I do not include a required parameter fraction absorbed (FA). No table can be found that summarizes the chemical-specific FA parameters for COPCs. This suggests that the dermal risks from water exposure may not have been correctly calculated in the BRA. Revise the risk assessment accordingly.

Section 5.1 Toxicity Assessment, page 26

29. The non-cancer toxicity criteria presented in Table 5.1 should be corrected to reflect a oral reference dose (RfD) for thallium of 6.6E-5 from the IRIS database.

Section 7.1.1.1 Terrestrial, page 40

30. The SERA states that federal and state agencies were contacted to determine the presence of special status species and habitats in proximity to the facility. The SERA should include an appendix that documents these contacts, including providing a copy of the response letter received from the organizations that were contacted.

Section 7.1.5 Exposure Pathways, page 49

31. The ecological conceptual site model (CSM) is discussed on page 49 and presented in Figure 6. The model is too generic because it only lists general categories of receptors (terrestrial, aquatic). The CSM should be revised to show the exposure routes for the communities (e.g., benthic invertebrates, fish) and guild (e.g., piscivorous birds,

mammals) receptors that will be assessed in the SERA.

Section 7.1.6 Ecological Receptors, page 50

32. Page 50 lists the ecological receptors that will be assessed in the SERA, but plants and soil invertebrates are omitted. These receptors should be included in the SERA, or rationale should be provided on why they should be excluded (e.g., absence of habitat).

33. The statement on page 50 that fish and macroinvertebrates were not observed in Mill Creek should be either supported or deleted. Morton's description of the site reconnaissance indicates that it was not designed to evaluate the presence of invertebrates and fish in Mill Creek. For example, electroshocking or minnow trapping do not appear to have been performed to detect the presence of fish. Also, benthic sampling does not appear to have been performed, so it is unclear how Morton would detect the presence of benthic invertebrates. Any statements regarding the absence of biota observations must be qualified relative to the ability to detect the species in question.

Section 7.1.7 Screening Endpoints, page 50

34. Page 50 discusses the measurement endpoints, which are phrased as the likelihood of their occurrence. Measurement endpoints should be described as the actual measurements that will be used to quantify risks (e.g., comparison of media concentrations to screening toxicity values). The SERA should be revised to include a list of specific measurement endpoints for each community and guild receptor assessed.

Section 7.2 Chemical Screening, page 51

35. Pages 51 through 54 describe the process for screening out COPCs, which included eliminating chemicals that were (1) not associated with historical activities, (2) were not detected, (3) did not have a screening value, or (4) were below background. Current U.S. EPA (1997; 2001a; 2001b) states that non-detected compounds and compounds without benchmarks should be included as COPCs. Additionally, background data cannot be used to screen out COPCs in a SERA. The FI Work Plan (Morton, 2000) states that one half of the detection limit of a non-detected compound will be used to screen for COPCs (Section 6, p. 5), but this was not followed in the SERA. Morton must revise the SERA to be consistent with current U.S. EPA screening level guidance, including considering all chemicals that cannot be appropriately screened out. Also, chemicals cannot be eliminated as COPCs if they are presumed not to be associated with Morton facility releases (p. 53), without additional justification and explanation in the SERA. For example, it is unclear how an apparently localized area of PCB contamination in site groundwater would not be attributed to site releases; this must be explained. The COPCs determined in the SERA can then be further examined in subsequent tiers of the assessment, such as the problem formulation phase of a baseline ecological risk assessment.

Section 7.2.1 Soil, page 51

36. The SERA discusses the use of soil data to a depth of four feet. Standard practice in ecological risk assessment is to use only surface soil data (e.g., to a depth of one foot). Morton may use only surface soil data if there are adequate data available for use in the SERA.

Section 7.2.1.1 Background Soil, page 51

37. Page 51 and 52 discuss concentrations of chemicals in background soils. As noted in General Comment 1 and Specific Comment 35, current U.S. EPA guidance does not allow screening out chemicals using background data in a SERA. Any future use in subsequent tiers of the ecological risk assessment will require additional information, including; (1) a description of physical/chemical and ecological characteristics of the background locations; (2) justification for their selection; and (3) comparison to regional background levels. U.S. EPA guidance recommends the use of background data only for metals in tier 2 or baseline assessments, and organic compounds cannot be screened out based on background concentrations.

Section 7.2.3 Seep, page 53

38. Page 53 states that total metal concentrations were compared to surface water screening values, rather than using dissolved concentrations of metals in seep water. Aquatic life ambient water quality criteria (AWQC) for metals is based on dissolved, rather than total metals (EPA, 1999). The facility may include a discussion of the uncertainties with assessing risks to aquatic life from total instead of dissolved metals concentrations.

39. Page 54 suggests that seep contributions to Mill Creek are very limited. Rather than speculate, this section should include a worst case calculation of surface water concentrations using maximum seep flows and minimum stream flows. The calculation should include all seeps that may discharge contaminants to the creek. The seep locations on the figures should be clearly labeled. For example, stream stations are shown on Figure 4, but it is unclear what samples were collected at these locations (e.g., sediment, and seep samples).

Section 7.3 Risk Characterization, page 54

40. Pages 54 to 55 discuss ecological risks from contaminated soil, sediment, and seeps, but wildlife risks are not characterized. Bioaccumulative contaminants were used on site (e.g., organotin compounds noted on page 4), and have been detected on site (e.g., PCBs in groundwater). The SERA must be revised to include an assessment of wildlife risks to potentially bioaccumulative compounds; see Table 4-2 of EPA (2000) for a candidate list

of bioaccumulative compounds. The SERA must include the specific rationale and justification for any excluded contaminants and potentially complete exposure pathways (e.g., why a chemical was detected but did not result from site activities, and what were potential non-facility sources).

41. Risks from contaminated soil, sediment, and seep water (p. 54-55) must be re-assessed according to the Specific Comments above. This will likely result in additional COPCs that should be noted in the risk description. Morton must provide a specific explanation for each chemical with a hazard quotient (HQ) greater than one that is not considered a COPC. Additionally, the risk characterization section should summarize the HQs determined in the SERA. For example, multiple HQs exceed 100, but this is not apparent in the text of this section.

42. Morton should ensure that the screening levels used (Tables 10.1 to 10.3) are consistent with the FI Work Plan (Morton, 2000), which specifies that Ohio screening values will be used if available. For example, Table 10.3 shows a screening value for barium of 5000, whereas the Ohio outside mixing zone average (OMZA) criteria screening level is 220 and would result in an HQ exceedance. Multiple other chemicals have surface water screening values that are greater than OMZA aquatic life values; this should either be corrected or explained by Morton. Additionally, if U.S. EPA Region 5 and Ohio screening values are not available for a specific chemical, alternative benchmarks should be considered. Standard sources include NOAA (1999), Efroymson et al. (1997), and Suter (1996).

43. A required component of the SERA is a discussion of uncertainties, but this component is not included in the report. A section of the SERA should include an explicit discussion of uncertainties and the potential to under or over estimate risks. For example, analytes may not include all possible site-associated contaminants (e.g., underestimation of risks) and site soil data include potentially more contaminated subsurface soil (e.g., overestimation of risks).

Section 7.4 Ecological Significance, page 55

44. Page 55 discusses the ecological significance of the risk results but does not provide a balanced summary of the results. For example, there are multiple HQs greater than 100, and the adequacy of analytical detection limits relative to screening benchmarks does not appear to have been evaluated (i.e., undetected chemicals may pose risks). Also, multiple analytes were sampled only once in sediments, so broad statements regarding an absence of risk can not be made with certainty. The ecological significance of contaminants at the Morton site must be re-evaluated in the SERA.

Section 8.0 Conclusions, page 55

45. The relatively high carcinogenic risks (1×10^{-4}) to the outdoor industrial worker are stated

to be driven largely by contaminants in the localized sampling area labeled T-1. The text dismisses the risk results by stating that concentrations outside of T-1 are at least an order of magnitude lower, which would result in an acceptable risk level. Additionally, the high hazard index (20) for the construction worker are stated to be driven by contaminants located in specific areas of the site, including sampling area T-1. The text indicates that concentrations beyond this area were at least an order of magnitude lower. This should be demonstrated quantitatively as a refinement to the risk assessment, with a less conservative assumption that outdoor workers are exposed to soil concentrations reflective of a more representative portion of the site, rather than the localized area around T-1 be used to calculate risks. This alternate quantitative result should be presented in the BRA report, rather than simply claiming that the risks would be acceptable under a different set of assumptions. The text of the report should also discuss the potential that the T-1 sampling area is a hot-spot that may require remediation.

46. The conclusions section indicates that the hazard index is 1.1 for the outdoor industrial worker. Rather than merely dismissing this result as a product of overly conservative assumptions related to the selection of exposure point concentrations, the risk report should note that the hazard index does not take into effect target organ effects. When the hazard index is properly partitioned into target organ effects, the hazard indices are acceptable for the outdoor worker.

47. The BRA concludes that additional assessment of ecological risks are unnecessary. As noted in the General and Specific Comments above, this conclusion is not supported. Morton must first revise the SERA following current U.S. EPA national guidance. Any COPCs determined in the SERA must then be evaluated in subsequent ecological risk assessment phases.

APPENDICES

48. In general, it is unclear why unshaded negative values are shown in the appendix tables (only shaded negative values are defined). The BRA should specify detection limits for all non-detected chemicals in each media, so that the adequacy of detection limits relative to the risk based screening levels for human and ecological risks can be assessed. This should be discussed in the report text. Appendices A through D should be revised to include this information.

Appendix H Vapor Migration Modeling

49. The equation to calculate the soil VOC emission rate on page H-2 is stated to be taken from U.S. EPA's *Soil Screening Guidance: Users Guide and Technical Background Document* (EPA540/R-95/128, May 1996). However the equation in this form cannot be located in the referenced document. It appears that Morton has altered the equation in the guidance used originally to calculate the volatilization factor (VF). However, it is unclear

how the inverse dispersion factor (Q/C) and the VF from the guidance are related to the emission rate (Ei) and soil concentration (Cs) in the BRA Appendix H. Either identify more precisely where in the referenced U.S. EPA document the Ei equation is located, or revise Appendix H to walk the reader more clearly through the transformation of the VF equation from the guidance into the Ei equation used in the risk assessment.

50. Provide a reference source for the equation used to calculate the total solute concentration (CT) shown on page H-3.

51. The equation to calculate the Q/C parameter on page H-6 of Appendix H is said to be taken from U.S. EPA's *Soil Screening Guidance: Users Guide and Technical Background Document* (EPA540/R-95/128, May 1996). However the equation in this form cannot be located in the referenced document. The more updated U.S. EPA's *Supplemental Guidance for Developing Soil Screening Levels at Superfund Sites* (OSWER Directive 9355.4-24, March 2001) indicates that Q/C equation (with data for the Cleveland OH area as used by Morton) should be:

$$Q/C = 12.8612 * \exp[(\ln A - 20.5164)^2 \div 237.2798]$$

Confirm that BRA has used the most up-to-date methodology to calculate the site-specific Q/C term.

52. The risk calculation for construction workers relies on a default particulate emission factor (PEF) of 2×10^7 m^3/kg provided on page H-7 of Appendix H. The reference source for this default value is not identified in the text or tables of the report. It is also unclear what relevance the ambient air quality standards for particulates (PM10) has to the use of a default PEF for the construction worker, as stated on page H-7. U.S. EPA's *Supplemental Guidance for Developing Soil Screening Levels at Superfund Sites* (OSWER Directive 9355.4-24, March 2001) provides methodology for calculating a site-specific Q/C factor for construction worker exposures that addresses the increased dust generation due to construction and excavation activities. Explain why this recent guidance methodology was not used, and provide justification and the reference source for use of a default PEF.

53. Response to previous comments on the FI Work Plan (Morton, 2000) indicated that exposure to both mechanical and wind-driven suspension of particulates in air should be addressed. Morton's response indicated that an evaluation of particulates from both types of emissions would be considered in the risk assessment. Explain why only fugitive (wind-driven) dust exposure is addressed. Note that exposure to dusts from construction activities should be addressed for both on-site and off-site receptors.

Appendix I Human Health Risk Assessment Calculations

54. The equation to calculate the PEF is presented on page 6 of Appendix I. It appears that

there is a mathematical problem in the spreadsheets that cannot be accounted for simply as a rounding error. When the parameter values provided in the table are input into the equation shown in the table, the PEF for manganese is 8.70E+8 and the PEF for other inorganics is 1.28E+9. Use of these corrected lower PEF values is more conservative in the risk assessment.

55. Page 8 of Appendix I presents dermal absorption fractions (ABS) for soil exposures that do not agree with the ABS parameters provided in U.S. EPA's *RAGS, Part E: Supplemental Guidance for Dermal Risk Assessment* (OSWER Directive 9285.7-01e, September 2001). This most recent dermal exposure guidance does not recommend default fractions for inorganics or volatiles lacking chemical-specific ABS values. Revise the HHRA accordingly.

56. Explain why a permeability constant (Kp) is not provided for acetone or 4-methylphenol in the table on page 8 of Appendix I. U.S. EPA's RAGS, Part E: Supplemental Guidance for Dermal Risk Assessment (OSWER Directive 9285.7-01e, September 2001) provides equations for calculating the Kp parameter.

57. The table summarizing physicochemical properties on page 9 of Appendix I is missing the constituents cadmium and 4-methylphenol. Revise the table to include these missing constituents.

58. The table on page 10 of Appendix I incorrectly lists the organic carbon partition coefficient (Koc) for methylene chloride. The correct Koc (from the reference document cited) should be 1.17E+1 l/kg. Revise the risk assessment accordingly.

59. The table on page 12 of Appendix I presents the parameters and equations used to calculate the dermal dose per event (DA_{event}) for water exposures. There are a number of problems with the equations as presented.

- Both DA_{event} equations are missing a chemical-specific parameter for fraction absorbed (FA).
- The second DA_{event} equation in the table lists a factor in the equation as $(1+B^2)$ when the correct factor should be $(1+B)^2$.
- The equation to calculate Dsc is incorrect and should be 10^(-2.80 - 0.0056MW)*l_{sc}. (The parameter l_{sc} corresponds to skin thickness.)
- The equation for the parameter b should be $[2(1+B)2/\pi]$ - c.

All of the values on the page 12 table of Appendix I should be corrected as appropriate to reflect the proper equations.

62. The reference source for the information in the page 12 table of Appendix I lists simply EPA 1998. This does not clearly correspond to any documents listed in the references

section of the report. It is also unclear why the EPA 2001 dermal guidance should not be listed as the source of the dermal exposure equations. Revise the table accordingly.

63. There appears to be a spreadsheet programming error in the table on page 13 of Appendix I. When the provided parameters are input into the equation to calculate the Concentration Soil (CT), the values do not agree with those provided in the page 13 table. It is also unclear why the column listing the Diffusivity in Air (Di) is provided since the parameter does not appear in any of the equations presented in the table. The spreadsheet errors should be corrected as appropriate.

64. Explain why the table on page 13 of Appendix I includes no calculated Concentration Soil Vapor (Cv) or CT values for aniline or 4-methylphenol.

65. The table on page 18 of Appendix I lists the groundwater concentrations for 1,3-dichlorobenzene, lead, and thallium as zero. The correct concentrations should be 0.041 mg/l, 0.024 mg/l, and 0.0078 mg/l, respectively.

66. The table on page 18 of Appendix I appears to include a spreadsheet programming error. All of the groundwater concentrations expressed in units of g/cm^3 are off by a factor of 1×10^{-3}. The spreadsheet and subsequent risk calculations should be corrected as appropriate.

67. The table on page 18 of Appendix I appears to include a second spreadsheet programming error in the calculation of the Ei expressed in units of g/m^2-sec. All the values appear to be low by a factor of 10. The spreadsheet and subsequent risk calculations should be corrected as appropriate.

68. The table on page 20 of Appendix I should be revised to provide appropriate parameter values for exposure frequency, inhalation rate, and exposure time. Currently these parameters are listed as "NA" (not applicable).

69. The table on page 27 of Appendix I should be revised to identify the PEF parameter values.

70. The table on page 34 of Appendix I appears to contain a spreadsheet programming error. It appears that an incorrect PEF value of 1×10^6 was used. The spreadsheet and subsequent risk calculations should be corrected as appropriate.

Appendix J Blood Level Evaluation

71. Explain why an exposure frequency of 219 days/year was used for the worker blood level evaluation. All other worker scenarios use an exposure frequency of 250 days/year. Explain the lack of consistency.

Literature Cited

Efroymson, R. A., Suter II, G. W., Sample, B. E., and Jones, D. S. 1997. *Preliminary Remediation Goals for Ecological Endpoints.* Oak Ridge National Laboratory. ES/ER/TM-162/R2. http://www.hsrd.ornl.gov/ecorisk/guidance.html

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EPA. 1999. *National Recommended Water Quality Criteria-Correction.* EPA 822-Z-99-001. U.S. Environmental Protection Agency. April 1999.

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TEN PERCENT DATA VERIFICATION REVIEW OF THE DATA VALIDATION

I. INTRODUCTION

U.S. EPA performed a ten percent data verification review of the data validation on samples reported in the July 27, 2001 and April 5, 2002 Field Oversight and Split Sampling Trip Reports. The validation included a total of 12 samples presented in the July 27, 2001 report and a total of 24 samples presented in the April 5, 2002 report. Thus, for the ten percent data verification review, a total of four samples were verified.

The samples selected for data verification are outlined in the table below.

Report	Sample Delivery Group (SDG)	Analysis	Sample Numbers
July 27, 2001	911367	Volatile Organic Compounds (VOCs)	UAW03
April 5, 2002	913561	Metals	SED-2
April 5, 2002	913967	VOCs	T2-9
April 5, 2002	913967	Semivolatile Organic Compounds (SVOCs)	GW-3

Data verification was performed to verify compliance with the U.S. EPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999), the *U.S. EPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (CLP Functional Guidelines; February 1994), and specific EPA methods. Because the raw data were not provided, no further judgement on the data quality could be made.

II. GENERAL COMMENTS

1. Each data validation report should be modified to provide a percentage for data completeness. The formula for data completeness is as follows:

$$\frac{\text{Number of data points not rejected}}{\text{Total number of data points}} \times 100$$

2. Each validation report should be a stand-alone document so that the end data user is able to quickly assess data quality. Separate reports for the same SDG have been submitted per

analyses and per matrix. The Contractor should ensure that each data validation report is complete and summarizes all of the outlying quality control (QC) parameters associated with the qualified data.

3. No judgement should be made on data that were not validated. This issue is addressed in the specific comments below.

4. Each report should also include an overall assessment of the data. The assessment should include a summary of method compliance and sampling issues in addition to a summary of qualifications affecting data quality and usability. The overall assessment of a data package is a brief narrative in which the data reviewer expresses concerns and comments on the data quality, and if possible, the usability of the data.

III. SPECIFIC COMMENTS

SDG No. 911367, VOCs, Matrix: Aqueous, Sample Number: UAW03

Calibrations

1. The CLP Functional Guidelines state that all response factors (RFs) should be $\geq$0.05. The initial and continuing calibrations for 2-butanone had reported RFs of 0.049 and 0.048, for the initial and continuing calibrations, respectively. The validation report stated that 2-butanone results were qualified as estimated. However, the RFs for this compound should be rounded off and reported as 0.05, in which case qualification based on poor RFs is not warranted.

SDG No. 913561, Metals and Mercury, Matrix: Sediment, Sample number SED-2

Data Completeness

2. The data validation report states that "although this sample was not validated, it appears that the tin result should be rejected due to poor spike recoveries." Include only data that is validated in the data validation report. Judgements made on unvalidated data should not be used for decision making purposes.

Duplicate Sample

3. When using the CLP Functional Guidelines, a criterion of 35 percent relative percent difference (RPD) is used if the sample or duplicate value is greater than or equal to five times the Contract Required Detection Limit (CRDL). Otherwise, the plus or minus two times the CRDL is used if either the sample or duplicate value is less than five times the CRDL. The bottom of page C-3 of the report states that results were within "the alternate

quality control (QC) limits," which should be identified as 35 percent. The report should be revised to clearly outline these guidelines.

Serial Dilution

4. Page C-4 of the report should be revised to clarify that the sample concentration was greater than 50 times the instrument detection limit (IDL) and the serial dilution percent difference (%D) was greater than ten percent, thereby warranting a qualification.

SDG No. 913967, VOCs, Matrix: Soil, Sample Number: T2-9

Laboratory Control Sample/Laboratory Control Sample Duplicate

5. Page C-13 of the data validation report, states that a soil laboratory control sample/laboratory control sample duplicate (LCS/LCSD) method blank (MBLK) not associated with the sample had "%R results for bromomethane and chloromethane that were outside of the QC limits." The report goes on to state that "the results associated with the MBLK would be qualified as rejected had they been validated." It is recommended that only the results for the validated samples be included in the reports. This issue is also addressed above in the general comments.

Matrix Spike/Matrix Spike Duplicate

6. The discussion on the matrix spike/matrix spike duplicate (MS/MSD) recoveries should be clarified. The report should be revised to clearly identify the compounds that exceeded the control limits, MS/MSD recoveries, and the associated control limits for each spiked compound. The report states that "soil MS/MSD %R results exceeded the control limits for 5 compounds. Additionally, one soil MS/MSD RPD result exceeded the control limits. No qualification was required since MS/MSD exceedances of this type do not necessitate qualifying the associated non-spiked sample results." It is unclear what type of exceedances are referenced and why no qualification is required. As per the CLP Functional Guidelines, no judgement is made on the data based on the MS/MSD results alone; however, if there appears to be a systematic problems in the analysis (as five compounds exceeding limits may indicate), then qualification of the spike sample alone may be warranted. The data reviewer should first try to determine to what extent the results of the MS/MSD affect the associated data. This determination should be made with regard to the MS/MSD sample itself as well as specific analytes for all samples associated with the MS/MSD. The reviewer must use professional judgement, and any such judgements and reasoning should be indicated in the data validation report.

SDG No. 913967, SVOCs, Matrix: Aqueous, Sample Number GW-3

7. Due to LCS recoveries exceeding the control limits, the sample was reextracted and reanalyzed. The report provides the results of both samples; however, the data validation report does not indicate which results should be used for decision making purposes. Based on the validated data, the report should be revised to indicate whether the results from the original sample or the reextracted sample should be used.

Calibrations

8. If the RF for a compound is less than 0.05, and the associated results for that compound are nondetected, then the compound must be qualified as rejected and flagged with a "R". The discussion on page C-28 of the report must be revised to clearly outline the qualifications of each compound.

MS/MSD

9. The report should be revised to clearly discuss the qualification of samples based on MS/MSD results. Page C-30 of the report makes statements that "the original results for most of these compounds for GW3 were rejected due to LCS exceedances. Therefore no additional qualifiers were issued based on these MS/MSD exceedances." The report should be revised to clearly identify the qualifications of each compound, rather than simply stating that most of the compounds have been previously qualified. For example, the following compounds should be qualified based on MS/MSD results, but were not qualified based on LCS/LCSD recoveries: phenol, hexachlorocylcopentadiene, 2-chloronaphthalene and acenaphthylene. The report should be revised to indicate how these compounds should be qualified in sample GW3.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:

DE-9J

April 8, 2002

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Peter V. Palena
Corporate Remediation Manager
Rohm and Haas Company
P.O. Box 584
Route 413 and State Road
Bristol, Pennsylvania 19007

Re: RCRA § 3013 Administrative Order
Morton International, Inc.
U.S. EPA ID No. 000 724 138

Dear Mr. Palena:

The United States Environmental Protection Agency (U.S. EPA) has reviewed the evaluation of pH data for the Morton International, Inc. (Morton) facility as summarized in a letter from Geomatrix Consultants, Inc. (Geomatrix), dated March 20, 2001. The letter from Geomatrix also proposes certain modifications to the field operating procedures and request for sampling and analysis with respect to measuring pH in groundwater. For record purposes, U.S. EPA considers the letter from Geomatrix to be dated March 20, 2002.

Based on its review of the letter from Geomatrix, U.S. EPA agrees that collected pH readings that are below the range of natural waters may possibly be due to fluctuating responses from the pH meter. However, U.S. EPA reserves the right to evaluate the appropriateness of the proposed modifications to the field operating procedures based on future field records and results. As clarification, *Study and Interpretation of the Chemical Characteristics of Natural Water, United States Geological Survey Water-Supply Paper 2254 - Third Edition*, indicates that most groundwaters found in the United States have pH values ranging from about 6.0 to about 8.5, unless they are associated with hydrothermal fluids. This range of pH would be expected at the

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from the Description of Current Conditions.

Moreover, U.S. EPA believes that the behavior of pH in groundwater at the Morton facility needs further evaluation with respect to operations/sources from the facility, such as the Combined Sewer System and the pH Control System. This is because pH values that are relatively-low appear to follow some spatial correlation across the facility. For example, some east/west distribution pattern is observed at the southern portion of the facility and some additional areas to the north. Also, the effect of pH on migration of metal contaminants needs to be evaluated.

Therefore, the Facility Investigation Report for the Morton facility must address the following aspects:

A. Evaluate whether the behavior of pH in groundwater indicates the presence of releases from operations/sources at the facility.

B. Evaluate the effect of pH on the migration of metal contaminants from the facility in groundwater.

If you have any questions regarding this letter, please contact me at 312/886-7567.

Sincerely yours,

Mirtha Capiro
Enforcement and Compliance Assurance Branch
Waste, Pesticides and Toxics Division

cc: Harold O'Connell, OEPA
Mark Hemingway, Geomatrix

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Suite 201
Austin, TX 78703
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GEOMATRIX

February 15, 2002
Project No. 7168

Ms. Mirtha Capiro
Project Coordinator
U.S. Environmental Protection Agency
Region 5
77 W. Jackson Boulevard, DRE-9J
Chicago, Illinois 60604-3590

RE: Scope and Schedule for Remaining Field Work
Facility Investigation, Morton International Inc.,
Reading, Ohio
RCRA Docket No. R3013-5-00-001

Subject: Scope and Schedule for Remaining Facility Investigation Field Work

Dear Ms. Capiro:

On behalf of the Rohm and Haas Co. (Rohm and Haas) and Geomatrix Consultants, Inc. (Geomatrix), this letter is intended to describe the field work remaining for completion of the referenced Facility Investigation (FI). It also provides the anticipated schedule for these activities, so that you can schedule your personnel to observe the activities, if desired. Anticipated analytical requirements are summarized in Table 1. Each planned activity is discussed below:

Completion of Lower Aquifer Groundwater Assessment

As we expressed in our January 23, 2002 meeting in Chicago, Geomatrix and Rohm and Haas feel that the Lower Aquifer well (LAW12-60) previously installed was in the location where Morton Facility constituents were most likely to be observed if they were reaching the Lower Aquifer. Given the absence of Morton Facility constituents in that well, we contend that no further evaluation of Lower Aquifer impact is required.

The USEPA expressed a different viewpoint, however, indicating that one additional well or cluster was required to close this issue. The USEPA indicated that this well or cluster should be located at the current UAW05-20/06-20 well pair location, and should include both shallow and deep groundwater sampling within the Lower Aquifer. The USEPA referenced data from the Pristine Superfund site, which showed that the concentration of contaminants varies within the Lower Aquifer. It is our understanding that an absence of Morton Facility constituents in Lower Aquifer samples from this well or cluster would be accepted by USEPA and Rohm and Haas as adequate demonstration that the Morton Facility is not impacting the Lower Aquifer, and that no further Lower Aquifer investigation would be required by Rohm and Haas.

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Geomatrix proposes to complete this activity as follows:

- Surface casing will be installed and grouted in place to a depth of approximately 40 feet below grade. The surface casing will be seated into the clay soils overlying the Lower Aquifer. Surface casing grout will be allowed to cure at least 24 hours before further drilling occurs.
- Rotasonic drilling methods will be used to advance a borehole through the surface casing to the base of the Lower Aquifer, estimated at 100 to 120 feet depth.
- A monitoring well pair will be constructed within the borehole, with one well screen placed in the lower 10 feet (nominal) of the Lower Aquifer, and a second well screen placed within the upper 15 feet (nominal) of the Lower Aquifer. To be clear, both wells will be placed within a single borehole, with annular seals separating the two screened intervals. A schematic of the new well is shown on Figure 1.
- After routine development per FI Work Plan requirements, both wells will be sampled and analyzed for Appendix IX list constituents, except for dioxins/dibenzofurans. The deletion of these parameters is based on their absence in all Appendix IX soil and groundwater samples analyzed to date for the FI.
- Consistent with FI Work Plan requirements, no soil samples will be collected for geochemical analysis during drilling. The requisite soil samples for this location have already been collected during the drilling of UAW05-20/06-20 (these upper aquifer wells are located within 25 feet of the proposed new lower aquifer location). Soil samples will be collected for lithologic description only.

Sampling of Mill Creek Sediments

This activity is discussed in detail in our letter to you dated December 20, 2001. It is our intention to perform these activities using the methods and approach described in that letter. Consistent with the USEPA's January 25, 2002 email comments, Geomatrix will collect sediment samples from the uppermost 6 inches of creek sediments. All field activities will be documented in the final investigation report.

Soil Sampling at T-1 and UAW-21

Based on elevated metals observed in association with two excavated drums at Trench T-1, Geomatrix will collect and analyze additional soil samples at this location. The elevated metals were observed in a small body of material believed to represent the former contents of the drums. Sample T-1-4' was collected from the trench excavation at a nominal depth of four feet just beneath the remnants of a crushed drum, and sample T-1-6' was collected at a nominal depth of six feet just beneath a green drum.

Four additional direct push borings will be advanced at and around the former T-1 location (see Figure 2 for boring locations). To assess the horizontal extent of impact around the two drums, samples will be collected for geochemical analysis at nominal depths of six feet from all borings. This will provide data surrounding the trench area at

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the approximate depth of the drums. Geomatrix will assess the vertical extent of any impact by collecting a sample at a nominal depth of 10 feet at the approximate former location of the drums. All samples will be analyzed for CLP-Target Analyte List (TAL) metals including tin.

A surface soil sample at the UAW21-80 location contained elevated levels of lead. In order to verify these findings, three additional surface soil samples will be collected from three locations surrounding UAW21-80, at a distance of approximately eight feet from the well. An additional surface soil sample will also be collected from the edge of the well pad itself. These samples will be analyzed for CLP-TAL metals.

Groundwater Sampling at UAW15-20 and UAW15-50

During the meeting on January 23, 2002 we discussed the resampling of the two referenced wells, to ensure that samples from these wells were not being switched or mislabeled. Since that meeting, we have re-visited the field notes from Phase 1 and 3 sampling, and have determined that there is no reasonable probability that this could have occurred. In particular, the well-sounding data from sampling logs makes it clear that the wells are correctly labeled in the field. Given this, we are no longer proposing to resample these wells.

Schedule

Geomatrix currently proposes to perform all field activities described in this letter during the week of March 4, 2002. Field activities are currently anticipated to require five to seven days.

Based on our January 23, 2002 meeting in Chicago, it is our understanding that these activities will fill all currently-known data gaps identified in the FI, relative to the objectives of the Administrative Order. If you have any comments with respect to the technical aspects of the work, or disagreements with our understanding of the agreements we have reached, please contact Peter Palena at Rohm and Haas as soon as possible. If Mr. Palena is not available, feel free to contact me.

Sincerely,
GEOMATRIX CONSULTANTS, INC.

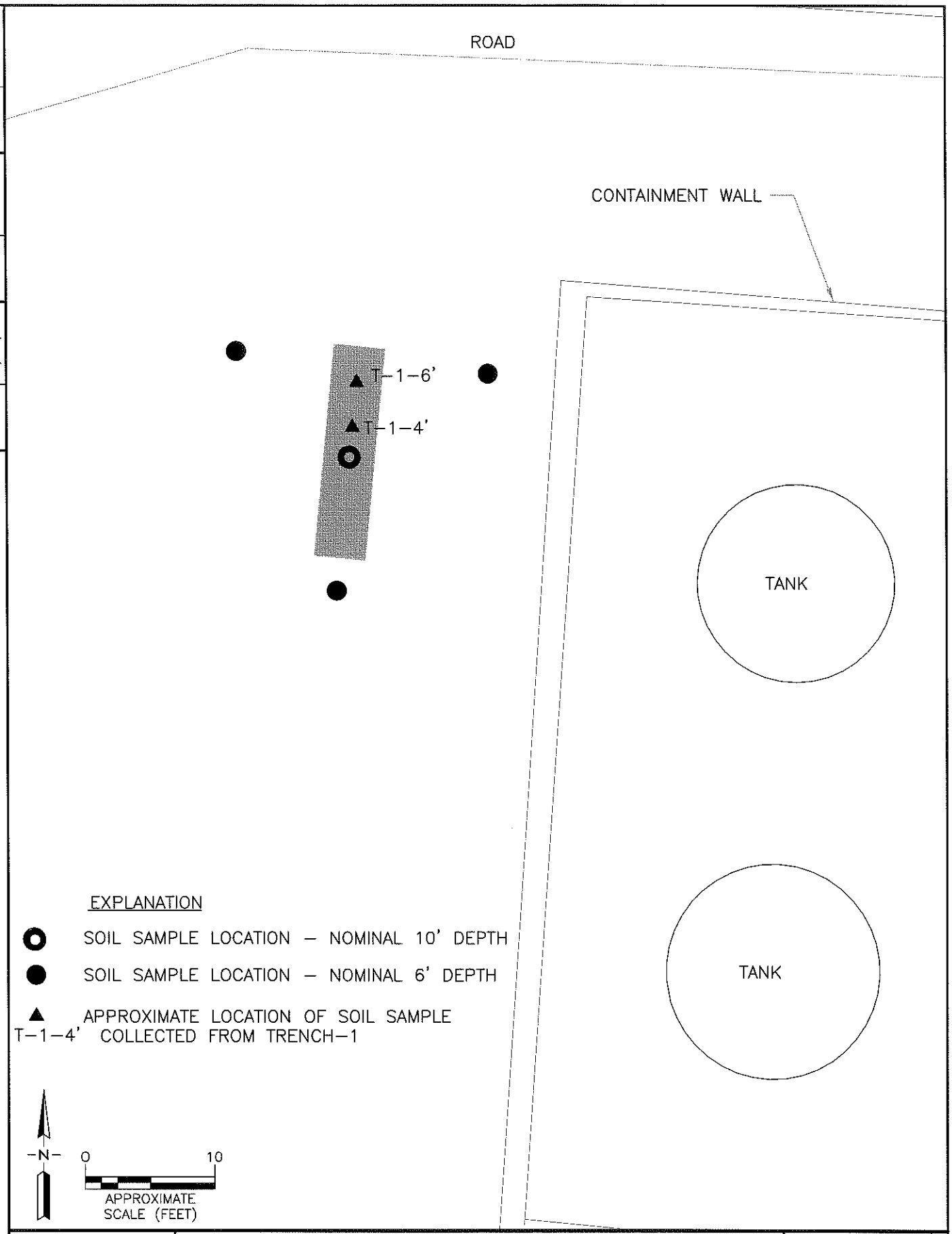
Mark P. Hemingway
Principal Hydrogeologist

Table 1
Analytical Requirements
for
Remaining Facility Investigation Field Work

Investigation Task	Target Analyte List
Lower Aquifer well pair - groundwater sampling, no soil sampling	Appendix IX, except for dioxins and dibenzofurans [1]
Sediment sampling	Seep/Sediment target analyte list [2]
Trench 1 (T-1) soil sampling	CLP metals plus tin [3]
UAW-21 soil sampling	CLP metals [3]

Notes:

1. Appendix IX Target Analyte List is provided in Table A1-2 of the Quality Assurance Project Plan.
2. The Seep/Sediment target analyte list was provided in previous correspondence to the USEPA, including the December 20, 2001 letter describing the sediment sampling scope of work.
3. CLP (Contract Laboratory Program) Target Analyte List is provided in Table A1-1 of the Quality Assurance Project Plan.



DRAFT BY	ERM 2/12/02	PROJ. CHK	A. RV. BY

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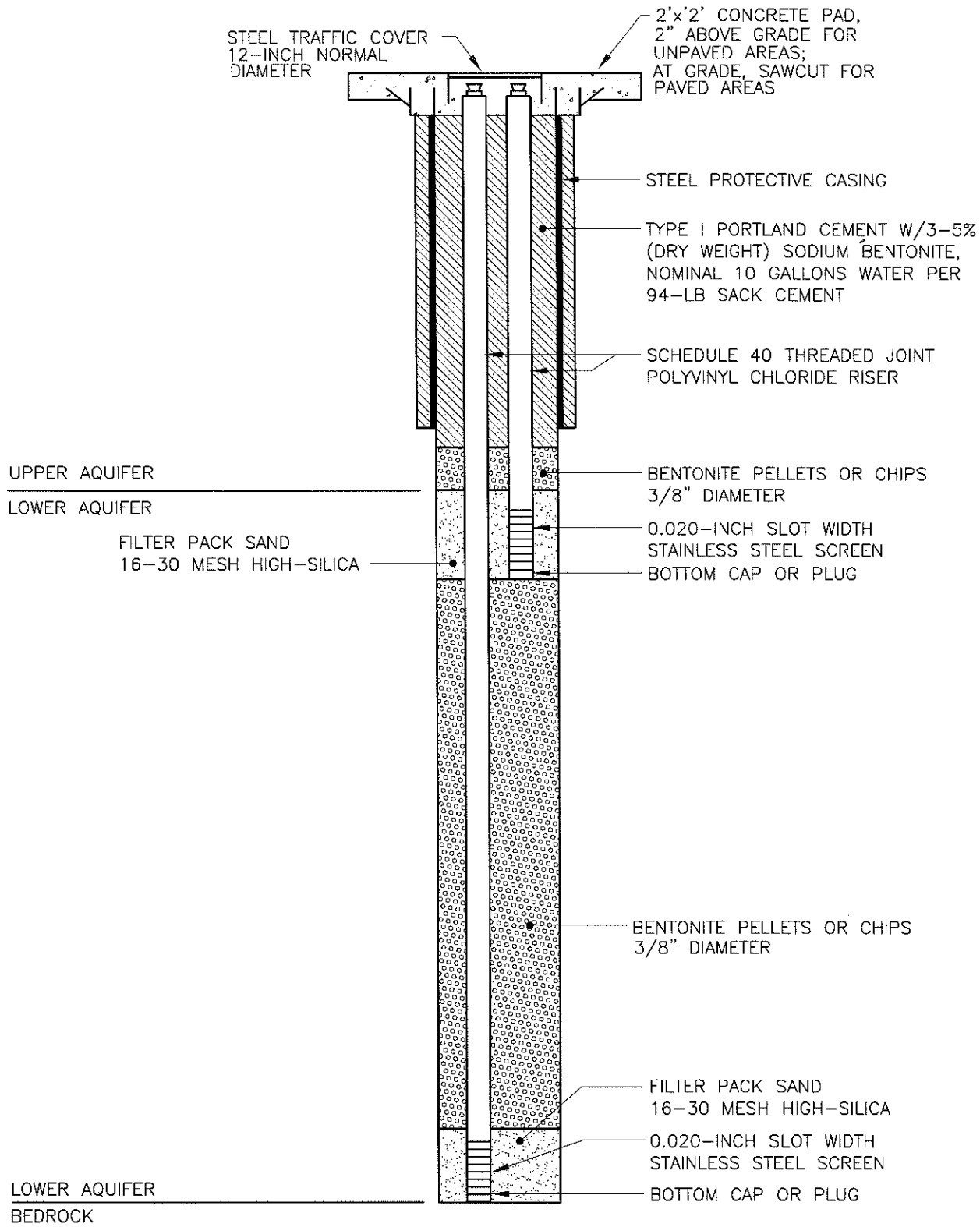
PROPOSED SOIL SAMPLE LOCATIONS
TRENCH-1
ROHM & HAAS
READING, OHIO

Project No. 7168

Figure No. 1

7168A02.DWG

DRAFT BY	ERM 2/12/02	PROJ. CHK	AMH	APPRV. BY	MPH



DRAWING NOT TO SCALE

GEOMATRIX	DUAL-CASED MONITORING WELL PAIR CONCEPTUAL SCHEMATIC PREPARED FOR MORTON FACILITY – READING, OHIO	Project No. 7168 Figure No. 2	7168AD1.DWG

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ROHM AND HAAS

23 January 2002

Hand Delivered

Mirtha Capiro
Enforcement and Compliance Assurance Branch
Waste, Pesticides and Toxics DivisionU.S.
Environmental Protection Agency
Region 5 (DE-9F)
77 West Jackson Street
Chicago, Illinois 60604-3590

Re: Morton International, Inc.
Reading, Ohio Facility
RCRA Docket No. R3013-5-00-001

This letter is to document the transmittal of a CD-ROM, which contains investigation-related data, to the USEPA Region 5 from the Rohm and Haas Company. The CD-ROM contains the following 13 files:

File Name	File Type	Description
Cin03.dwg	Autocad	Base map of site
CRG ChemCin.XLS	Excel WB[1]	Import Worksheet for the EQuIS Chem Module
CRG GeoCin.XLS	Excel WB	Import Worksheet for the EQuIS Geo Module
CRG BAT20011125CIN.CSV	CSV[2]	Laboratory Batch Information
CRG DRA20011125CIN.CSV	CSV	Drilling Activity Information
CRG LOC20011125CIN.CSV	CSV	Sample Location Information
CRG GWTR20011125CIN.CSV	CSV	Groundwater Levels Information
CRG LTH20011125CIN.CSV	CSV	Lithology Information
CRG SITE20011125CIN.CSV	CSV	Site Information
CRG SMP20011125CIN.CSV	CSV	Sample Collection Information
CRG TRSQ20011125CIN.CSV	CSV	Analytical Sample Information
CRG WEL20011125CIN.CSV	CSV	Well Information
CRG WSG20011125CIN.CSV	CSV	Well Segment Information

1 Microsoft Excel 2000 Workbook
2 Comma Separated Values File

The data is presented in both and Excel workbook format and a comma separated values (text file) format. These formats are similar to the USEPA Region 5 EQUIS data file formats. If there any questions about the files, please contact Dr. Paul Cichy (215)-785-7734 for help.

Sincerely,

Peter V. Palena Jr.
Rohm and Haas Company
Remediation Project Manager

PPalena@rohmhaas.com

10/03/01 06:09 AM

To: annehaikola@hotmail.com, Mirtha Capiro/R5/USEPA/US@EPA, mhemingway@geomatrix.com, RLantzy@rohmhaas.com
cc:
Subject: Cincinnati Facility Investigation Schedule

Mirtha,

Attached is an updated field schedule for the Morton-Cincinnati Facility Investigation. We had originally scheduled the Swale area trenching for Saturday (Oct 13) and Sunday (10/14) to minimize the impact on plant operations. We have learned that there are children's soccer games played at the fields next to the parking lot. These games are played the weekends through the end of October. Therefore, due to the proximity of these fields to the Swale area, we are postponing the trenching until the middle/end of November. We will notify the USEPA and TechLaw when we have established a firm date for this activity.

If you have any questions, please do not hesitate to contact me.

Peter
(See attached file: phase.xls)

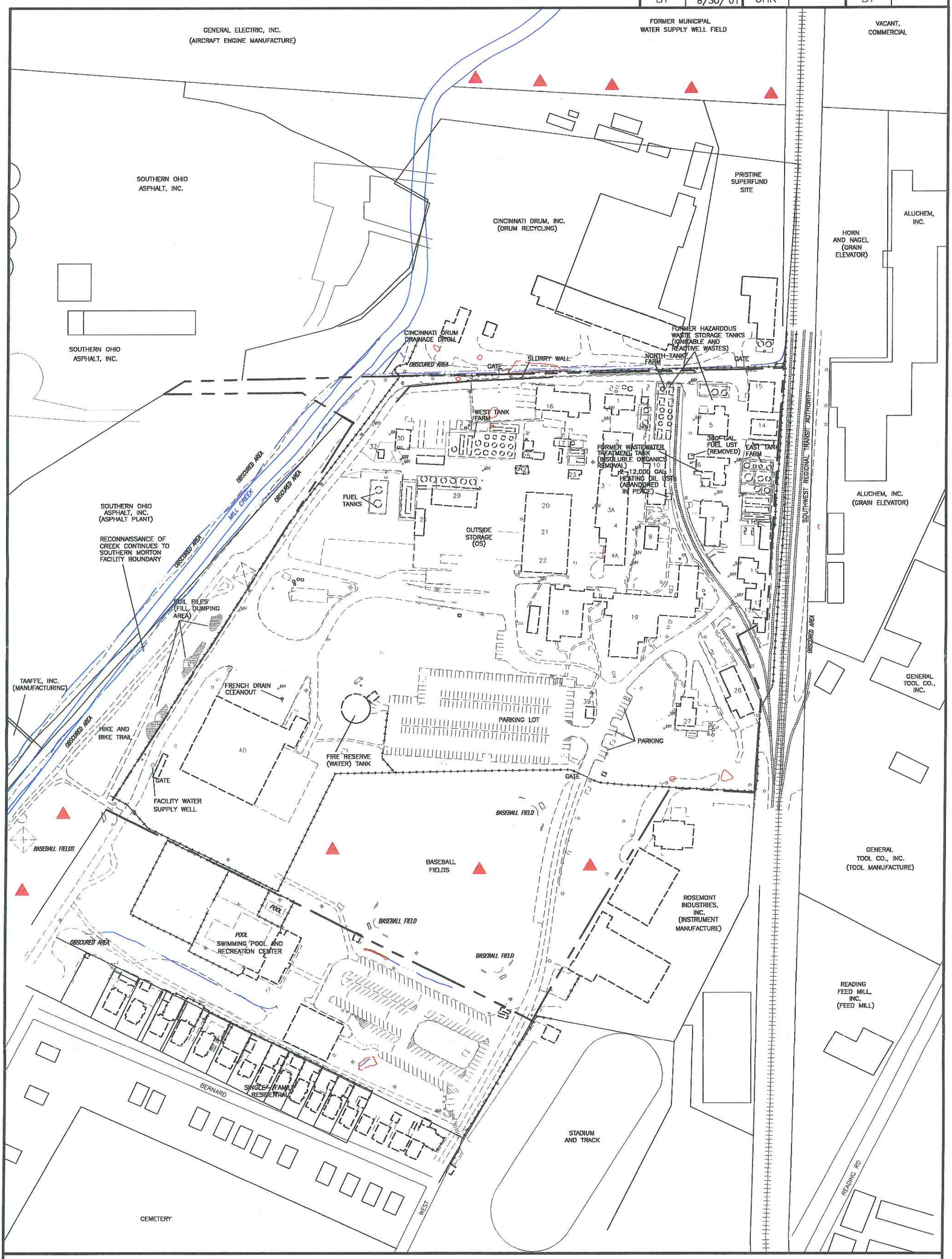
phase.xls

Version 00
d: 10/4/01

Phase2 Facility In[illegible]igation Schedule
Morto[illegible]acility
Reading, Ohio

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	
	8 Need rolloff box @ circle	9	10	11 Mike Welly - TechLaw/USEPA	12 Mike Welly - TechLaw/USEPA	13	OCTOBER
	Travel AM	Nutting Training		Erik & Chas - Sed& Seep Sampling - Mill Creek			
	Erik - meet DiCarlo for mowing of off-site property	Chas - Well Dev w/ Boart - start with UAW-10	Chas - Spot Check Boart Well Dev.	Tim - Boart complete Well Dev.			
	All - install seep samp. points	Erik Off-site DPT w/Nutting	Erik - Off-site DPT w/ Nutting		Erik & Chas - Groundwater Sampling	All - Groundwater Sampling	
	All - organize for the week	Tim & Chas - groundwater sampling (UAW10)	Tim & Chas - groundwater sampling	Tim begin Aquifer Test w/Boart	Tim - Aquifer Test		
		Erik - Survey Phase 2 locations w/Abercrombie					
			All - Frac Tank drain & cleanout transfer sludge to rolloff w/Dicarlo	All - Frac Tank drain & cleanout transfer sludge to rolloff w/Dicarlo	All - APARTMENT MOVE	All - APARTMENT MOVE	
14	15	16	17	18	19	20	
22	23	24	25	26	27	28	

DRAFT BY	RPS 8/30/01	PROJ. CHK		APPRV. BY	



Base Map Source: American Process Design, Inc., Cincinnati, OH., Proj. No. 16151, 410, 6/4/98.

N

0 200

APPROXIMATE SCALE (FEET)

EXPLANATION

▲ PROPOSED BACKGROUND SAMPLING LOCATION

— — — — MORTON FACILITY PROPERTY BOUNDARY

PROPOSED BACKGROUND SAMPLING PROGRAM

PREPARED FOR

ROHM AND HAAS CO.
READING, OHIO

GEOMATRIX

Project No.	Figure
7443-A	.

7443B01.DWG

1214 West Sixth Street, Suite 201
Austin, Texas 78703
(512) 494-0333 • FAX (512) 494-0334

GEOMATRIX

September 10, 2001
Project No. 7168

Ms. Mirtha Capiro
Project Coordinator
U.S. Environmental Protection Agency
Region 5
77 W. Jackson Boulevard, DRE-9J
Chicago, Illinois 60604-3590

RE: Proposed Background Sampling Program,
Morton International, Inc., Reading, Ohio
RCRA Docket No. R3013-5-00-001

Dear Ms. Capiro:

Enclosed please find a map of the Morton Facility and the immediate surrounding area. As discussed in Section 5.14 of the Facility Investigation (FI) Work Plan, background soil samples will be collected from locations that could not reasonably have been affected by current or historic Morton Facility releases. The attached figure illustrates proposed sampling locations, both on Morton property and at locations immediately surrounding the facility. Rohm and Haas received permission to collect samples on the City of Reading Property just to the southwest of the Morton property and also in the former Municipal Well Field North of the the plant adjacent to the Cincinnati Drum property. As shown on the attached map, five locations will be collected south of the Morton plant and five will be collected north of the Morton plant for a total of ten background samples. As you have discussed with Peter Palena, all other neighboring landowners either denied requests for access, or did not respond to those requests.

Section 5.14 of the FI Work Plan specifies that background samples will be analyzed for those CLP-TAL and App. IX-TAL constituents identified in FI soil or groundwater samples during Phase 1. With the exception of the compounds aniline, isodrin, and tin, all of the compounds detected are included in the CLP-TAL (the CLP-TAL is summarized in Table A1-1 of Appendix A of the FI Work Plan). In the interest of obtaining a complete data set, Rohm and Haas will analyze the background samples for the full CLP-TAL plus aniline, isodrin, and tin.

If you have any questions, please feel free to contact Peter Palena at (215) 785-7085 or me at (512) 494-0333.

Sincerely,
GEOMATRIX CONSULTANTS, INC.

Mark P. Hemingway
Principal Hydrogeologist

100 INDEPENDENCE MALL WEST, PHILADELPHIA, PA 19106-2399 USA
TELEPHONE (215) 592-3000 CENTRAL FAX (215) 592-3377

David C. Kurland, Esq.
Tele: (215) 592-3691
Fax: (215) 592-3227
E-mail: David_C_Kurland@RohmHaas.com

RECEIVED
SEP 01 2000
Enforcement & Compliance Assurance Branch
Waste, Pesticides & Toxics Division
U.S. EPA – REGION 5

ROHM AND HAAS

August 31, 2000

Ms. Mirtha Capiro
Enforcement and Compliance Assurance Branch
Waste, Pesticides and Toxics Division
U.S. Environmental Protection Agency
Region 5 (DE-9F)
77 West Jackson Street
Chicago, Illinois 60604-3590

Mr. Thomas Nash
US Environmental Protection Agency
Region 5
77 West Jackson Boulevard C-14J
Chicago, IL 60604-3590

Subject: Draft Proposal for Monitoring, Testing, Analysis and Reporting Administrative Order R3013-5-00-001

Dear Ms. Capiro and Mr. Nash:

Morton International Inc. ("Morton") hereby submits a draft of the Proposal for Monitoring, Testing, Analysis and Reporting at its Reading, Ohio site that is required by Section VI of the above-referenced Order. We look forward to discussing this draft with you in your offices in September 11, incorporating your comments, and submitting a final version by September 18 for your approval.

The elements of this Proposal are a series of initial planning meetings and submittals, followed by a multiphase site investigation. Each phase of sampling and analysis will build on the preceding phase to ensure the objectives of the investigation keep pace with the acquisition of data.

There is a large body of investigative work to be performed in order to evaluate environmental conditions at the site, and adequate time must be spent by both parties in initial planning and discussions to ensure success. Therefore, the first major deliverable in the Draft Proposal is a Current Conditions Report ("CCR") because effective planning and implementation must be based on both parties' careful review of all existing data. The CCR will provide the technical basis for all subsequent work, and will be followed by submittal of an RFI Workplan in November, 2000, implementation of the RFI in March, 2001, and completion of the investigation before June 1, 2002.

As Peter Palena, Rohm and Haas' Project Coordinator, discussed with Mr. George Hamper, this Draft Proposal allows for development of consensus on scope and approach, while maintaining the June 1, 2002 completion target. We believe that the EPA Project Manager's approval of the final Proposal by September 18, 2000 will allow the implementation of this schedule, which is summarized in the following table.

DRAFT Proposal for Monitoring, Testing, Analysis and Reporting
Morton Facility, Reading, Ohio

Date	Activity	Purpose
September 11, 2000	Initial Meeting	Refine schedule, discuss broad objectives and key facts
October 2, 2000	Submittal of Current Conditions Report	Provide basic description of setting, history, and operations, to allow for proper scoping and review of RFI Work Plan
October 16, 2000	Scoping Meeting	Discuss preliminary review of CCR, describe and discuss proposed scope of RFI, including detailed scope of Phase 1 activities
November 13, 2000	Submittal of RFI Work Plan	Describe procedures, methods, locations, depths, etc. for RFI, including strategy and triggers for successive phases Develop QA/QC and health and safety protocols
November 2000 through January 2001	Agency Review of RFI Work Plan and CCR	Allow for on-going review, discussion, and modification of investigation approach
March 2001 through May 2001	<u>Phase 1 of RFI</u> • On-Site Upper Aquifer Wells • On-Site Upper Aquifer Stratigraphic Borings • P&A Obsolete On-Site Wells • Groundwater Sampling • Combined Sewer System Evaluation	• Characterize hydrogeology of shallow aquifer • Evaluate effectiveness of groundwater collection system • Delineate on-site impact to shallow aquifer • Characterize potential releases from sewer system

DRAFT Proposal for Monitoring, Testing, Analysis and Reporting (Cont'd)
Morton Facility, Reading, Ohio

June 2001	Scoping of Phase 2	Discussion and meetings between Morton and USEPA to review Phase 1 findings and plan details of Phase 2
July 2001 through September 2001	<u>Phase 2 of RFI</u> • Install Supplemental Upper Aquifer Wells • Groundwater Sampling • Aquifer Testing • Mill Creek Sediment & Seep Testing • SWMU Soil Borings • Geophysical Survey of Former Swale • Ecological Survey	• Complete on-site and off-site assessment of shallow aquifer. • Characterize hydraulics of shallow aquifer, and communication with deeper aquifer • Characterize soil impact at potential release sites • Characterize residual or on-going impact from facility to creek • Evaluate possible historical waste disposal in this area • Identify potential ecological receptors
October 2001	Scoping of Phase 3	Discussion and meetings between Morton and USEPA to review Phase 2 findings and plan details of Phase 3
November 2001	<u>Phase 3 of RFI</u> • Characterization of Any Identified Human Receptors • Final Upper Aquifer Well Installation • Trenching or Drilling at Swale	• Provide information for HHRA • Close any remaining data gaps • Evaluate detected anomalies in Swale
December 2001 through February 2002	Data Evaluation and RFI Report Preparation	Tabulate and interpret RFI findings
March 2002 through May 2002	Agency Review and Morton Revision of RFI Report	Provide RFI findings in a form suitable for agency and public review

This schedule is reasonable, practicable, and aggressive. It takes into account the difficulty of field investigation during the winter months, while still meeting the timeframe set forth in the Order.

Please note that the quick pace of this schedule does not allow for preparation, submittal, and review of detailed reports and work plans between each phase of work. In addition, delays caused by administrative reviews longer than those proposed here will impact the overall schedule. Instead, Morton will propose detailed sampling and analytical methods in the initial RFI Work Plan, so that the Project Coordinators will only need to evaluate recently collected data and decide on the next investigation activities before each successive phase. Quarterly progress reports will be submitted to the agency, including summaries of analytical reports, copies of field documentation, photographs, etc. This should provide USEPA with a complete written record and an opportunity to review and influence activities and findings well in advance of the final report.

I will contact you on September 5 regarding the proposed meeting on September 11. I appreciate your consideration of our approach, and look forward to speaking to you soon.

Sincerely,

David Kurland
Senior Counsel

DCK/vjc

cc: Peter Palena

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

August 27, 2001

REPLY TO THE ATTENTION OF

DE-9J

CERTIFIED MAIL 7099 3400 0000 9588 5957
RETURN RECEIPT REQUESTED

Peter V. Palena
Corporate Remediation Manager
Rohm and Haas Company
P.O. Box 584
Route 413 and State Road
Bristol, Pennsylvania 19007

Re: RCRA § 3013 Administrative Order
Morton International, Inc.
U.S. EPA ID No. 000 724 138

Dear Mr. Palena:

The United States Environmental Protection Agency (U.S. EPA) has completed review of the replacement pages for the May 2001 Revision to the Facility Investigation (FI) Work Plan and Quality Assurance Project Plan (QAPP) for Morton International Inc. (Morton). The replacement pages were submitted by Geomatrix Consultants, Inc. on behalf of Morton pursuant to the requirements of the Administrative Order.

Based on the above review, the U.S. EPA hereby issues final approval of the FI Work Plan for the Morton facility with the following condition:

> Where guidance and references are periodically updated, the most current version will be used in the implementation of the FI Work Plan.

In accordance with the above approval, we are enclosing two copies of the completed QAPP signature page for your files.

Recycled/Recyclable • Printed with Vegetable Oil Based Inks on 50% Recycled Paper (20% Postconsumer)

If you have any questions regarding this letter, please contact me at (312) 886-7567 or at "capiro.mirtha@epa.gov".

Sincerely,

Mirtha Capiro
Project Coordinator/Manager
Enforcement and Compliance Assurance Branch

Enclosures

cc w/o enclosures: Thomas C. Nash, C-14J
Harold O'Connell, OEPA
Mark Hemingway, Geomatrix Consultants, Inc.

1214 West Sixth Street, Suite 201
Austin, Texas 78703
(512) 494-0333 • FAX (512) 494-0334

GEOMATRIX

August 16, 2001

Ms. Mirtha Capiro
Project Coordinator
U.S. Environmental Protection Agency
Region 5
77 W. Jackson Boulevard, DRE-9J
Chicago, Illinois 60604-3590

RE: May 2001 Revision,
Facility Investigation Work Plan and Quality Assurance Project Plan,
Morton International, Inc., Reading, Ohio, **RCRA Docket No. R3013-5-00-001**

Dear Ms. Capiro:

At the direction of the Rohm and Haas Co., Geomatrix Consultants, Inc. (Geomatrix) is submitting the replacement pages for the May 2001 Revision to the Facility Investigation Work Plan (FI Work Plan) and Quality Assurance Project Plan (QAPP) for the referenced facility. Specifically, please replace the following in your copies of the:

Facility Investigation Work Plan

Section 6.0 – revised
Section 7.0– revised
Section 10.0 – revised
Table 7-1 - revised

Quality Assurance Project Plan (Appendix A of the Facility Investigation Work Plan)

Table A1-8 – revised

If you have any questions, please feel free to contact Peter Palena at (215) 785-7085 or me at (512) 494-0333.

Sincerely,
GEOMATRIX CONSULTANTS, INC.

Mark P. Hemingway
Principal Hydrogeologist

cc: Mr. Peter V. Palena, The Rohm and Haas Co. (2 copies of Revision 01 – May 2001)
Mr. Eric L. Walker, The Rohm and Haas Co. (1 copy of Revision 01 – May 2001)
Mr. Todd Quillen, TechLaw Inc. (1 copy of Revision 01 – May 2001)
Attachments – 3 copies of Revision 01, May 2001

100 INDEPENDENCE MALL WEST, PHILADELPHIA, PA 19106-2399 USA
TELEPHONE (215) 592-3000 CENTRAL FAX (215) 592-3377

REPLY TO:
ENGINEERING DIVISION
584
BRISTOL, PA 19007
(215) 785-7000 FAX (215) 785-7458

ROHM AND HAAS

11 August 2001

Certified Mail
Return Receipt Requested

Ms. Mirtha Capiro
U.S. Environmental Protection Agency, Region 5
77 West Jackson Boulevard, DE-9J
Chicago, IL 60604

Re: RCRA § 3013 Administrative Order
Morton International, Inc.
U.S. EPA ID No. 000 724 138

Dear Ms. Capiro,

Enclosed is a copy of the response from Mr. Jeff Long, President; Cincinnati Drum Services, to Rohm and Haas' request for access to monitoring wells located on the Cincinnati Drum Services' facility and Pristine Superfund Site. These monitoring wells were installed as part of the Pristine Superfund Site investigation and remediation project. Mr. Long denied Rohm and Haas access to the property because he does not see a need for further investigation of the groundwater aquifer.

Rohm and Haas made its best effort to secure access to this property and has completed its effort to gain access to this property.

If you have any questions please do not hesitate to contact me at 215-785-7079.

Sincerely,

ROHM AND HAAS COMPANY

Peter V. Palena Jr

Peter V. Palena
Corporate Remediation Manager

Attachment - Jeff Long letter to Peter Palena dated 7 August 2001

cc: Jeff Wyant, Rohm and Haas Company
Mark Hemingway, Geomatrix Consultants

CINCINNATI DRUM SERVICE, INC.

RECONDITIONERS OF STEEL AND POLYETHYLENE CONTAINERS

P.O.BOX 16141
LUDLOW, KY 41016-0141

Phone 859-431-8335
Fax 859-261-0979

Chester Long
(1919-1979)

Oren Long
(1921-1997)

August 7, 2001

COPY

Rohm & Haas Company
Box 584
Bristol, PA 9007

ATTN: Mr. Peter Palena, Remediation Project Manager

RE: ACCESS AGREEMENT

Dear Peter:

At this time, Cincinnati Drum Service, Inc. does not see the need for further investigation of the ground water aquifer requiring access to our property. It is our belief that the available monitoring well data, on record, through the investigation and remediation of the Pristine Superfund site should be satisfactory.

Sincerely,

CINCINNATI DRUM SERVICE, INC.

Jeffrey D. Long
President

JDL/cjs

Mark Hemingway
<MHemingway@geomatrix.com>

08/03/01 10:32 AM

To: Mirtha Capiro/R5/USEPA/US@EPA
cc: Peter_V_Palena@rohmhaas.com, "'Ahaikola@texas.net'" <Ahaikola@texas.net>, "'TQuillen@Techlawinc.com'" <TQuillen@techlawinc.com>
Subject: RE: Sediment Sampling Parameters & Revised FI Work Plan

Mirtha--

Datalogging transducers were placed in a number of Upper Aquifer wells to monitor any changes in Upper Aquifer water levels when the Pristine pumping system was shut down, then restarted. The actual data will be provided with the next quarter's progress report. The wells so monitored are distributed across the site, with respect to both location and depth, and are:

UAW02-40 -- on western facility boundary
UAW09-20 -- on southern fenceline, at north edge of ball fields
UAW09-20 -- same as above
UAW13-20 -- on north facility boundary, next to former surface impoundments
UAW15-50 -- in central portion of facility, at edge of main process areas
UAW17-40 -- southeast corner of facility
UAW19-80 -- northeast area of facility, along east boundary
UAW21-80 -- southwest area of facility, near public recreation center.

As a reminder, the number at the end of the well name indicates the approximate depth of the bottom of the screened interval.

I hope this provides you with the information you need. Feel free to contact me with any additional questions.

Mark

-----Original Message-----
From: Capiro.Mirtha@epamail.epa.gov
[mailto:Capiro.Mirtha@epamail.epa.gov]
Sent: Thursday, August 02, 2001 11:44 AM
To: Mark Hemingway
Cc: Peter_V_Palena@rohmhaas.com
Subject: Re: Sediment Sampling Parameters & Revised FI Work Plan

Mark,

Thanks for the information you sent me. There is one additional item needed as I explain below.

Page 2 from the second quarter report indicates that water level changes have been measured at selected upper aquifer wells. Please identify the selected wells or, if appropriate, cite where this information can be found in the report. Thanks. -- Mirtha

Mark Hemingway
<MHemingway@geomatrix.com>
08/01/01 02:57 PM

To: Mirtha Capiro/R5/USEPA/US@EPA
cc: "'PPalena@rohmhaas.com'" <PPalena@rohmhaas.com>, "'Tquillen@TechLawInc.com'" <Tquillen@techlawinc.com>
Subject: Sediment Sampling Parameters & Revised FI Work Plan

1214 West Sixth Street
Suite 201
Austin, TX 78703
(512) 494-0333 • FAX (512) 494-0334

GEOMATRIX

July 11, 2001

Ms. Mirtha Capiro
Project Coordinator
U.S. Environmental Protection Agency
Region 5
77 W. Jackson Boulevard, DRE-9J
Chicago, Illinois 60604-3590

RE: Combined Sewer System (CSS) Evaluation,
Facility Investigation (FI),
Morton International Inc., Reading, Ohio
RCRA Docket No. R3013-5-00-001

Dear Ms. Capiro:

As we discussed during our last conference call, Geomatrix has recommended to the Rohm and Haas Co. (Rohm and Haas) and the U.S. Environmental Protection Agency that we modify the initially proposed CSS evaluation approach. You will recall that this approach consisted primarily of a camera survey of all underground portions of the CSS, followed by borings at locations with major failures or losses of integrity.

This approach was initially recommended as an efficient way to focus investigative effort on focus areas within the CSS. To this end, Geomatrix has performed a camera evaluation of approximately 1700 linear feet of the CSS. This effort has made it clear, however, that this approach lacks the anticipated efficiency. Camera work within the sewer is relatively slow, particularly in the smaller lateral runs.

For this reason, Geomatrix and Rohm and Haas propose the following approach to CSS evaluation.

- Camera surveys of all main lines within the CSS. Mains are defined as those portions of the CSS with diameters of 12 inches or greater, and comprise approximately 1/3 of the CSS network. Mains are located throughout the primary process and storage areas, in addition to downstream of all process and wastewater inputs. Mains are also the portion of the system that ultimately transports waters beyond the site boundaries. The extent of these lines is shown on Figure 2-6 of the Current Conditions Report (Geomatrix, 2000), which shows the locations and diameters of CSS lines.

- Visual inspections of all open trench or strip drains within the CSS.

- Subsequent evaluation using borings or other means, depending on camera survey and visual inspection findings. These evaluation methods will be scoped and proposed to you subsequent to the camera survey and visual inspection.

In combination with the 1700 linear feet of CSS which has already been camera surveyed, this will yield direct evaluation of approximately 5000 linear feet of sewer, including the portion that transports the largest volumes of wastewater.

I believe this modification will allow us to more effectively assess the CSS. The data we collect in this manner will meet the objectives put forward for the FI in the FI Work Plan, and also meet the requirements of Administrative Order.

On another issue, we have made attempts to contact all neighboring property owners regarding access for background sampling. We are actively pursuing this issue in order to stay consistent with our plans to submit background locations to you by August 3, 2001 and perform the background sampling in August 2001. Responses to date have been mixed, and we will be continuing to work for access in desired locations.

If you have any questions, please feel free to contact me at (512) 494-0333.

Sincerely,
GEOMATRIX CONSULTANTS, INC.

Mark P. Hemingway
Principal Hydrogeologist

cc: Mr. Peter V. Palena, The Rohm and Haas Co.
Eric Walker, The Rohm and Haas Co.
Mr. Todd Quillen, Tech Law Inc.

1214 West Sixth Street
Suite 201
Austin, TX 78703
(512) 494-0333 • FAX (512) 494-0334

GEOMATRIX

June 29, 2001

Ms. Mirtha Capiro
Project Coordinator
U.S. Environmental Protection Agency
Region 5
77 W. Jackson Boulevard, DRE-9J
Chicago, Illinois 60604-3590

RE: Facility Investigation, Morton International Inc.,
Reading, Ohio
RCRA Docket No. R3013-5-00-001

Dear Ms. Capiro:

At the direction of the Rohm and Haas Co., Geomatrix Consultants, Inc. (Geomatrix) is submitting the list of target analytes for sediment and seep analysis, for your review. As stated in Section 5.9 of the Facility Investigation Work Plan:

> *"The analysis of seep and sediment samples is intended to identify and quantify any compounds derived from or migrating beneath the Morton Facility, as opposed to compounds that may be migrating along Mill Creek from upstream sources. Given this seep and sediment samples will only be analyzed for those constituents (and their likely degradation products) detected in groundwater samples."*

In order to select compounds that could potentially migrate from the Morton Facility to Mill Creek in groundwater, Geomatrix has considered all compounds detected within the shallowest transmissive zone observed. This is a sand layer typically ranging from 10 to 25 feet in depth beneath the Morton Facility. Based on relative elevations, this stratum could potentially be in hydraulic communication with Mill Creek. Compounds detected only in deeper strata (i.e., from depths of 40 to 80 feet) were not considered, as it does not appear that these strata could discharge groundwater to the creek.

Of the compounds detected in the shallow sand, there was one J-coded detection of cis-1,2-dichloroethene (c-1,2-DCE) (1.7J µg/l) and one detection of tetrachloroethene (PCE) (11 µg/l). These compounds are currently interpreted, based on the balance of Phase 1 data, to be derived from the Pristine Superfund Site. Given this, as well as their low levels in the zone of interest and their absence in wells along the boundary with Mill Creek, these compounds have been excluded from the target analyte list for sediments and seeps. All other compounds detected have been included, as well as their likely degradation products, to the extent that those degradation products appear on the Appendix IX or Contract Laboratory Program Target Analyte Lists specified in Tables A1-1 and A1-2 of the Quality Assurance Project Plan

GEOMATRIX

(Geomatrix, 2000). The resulting parameter list for analysis of sediment and seep (if any active seeps are identified) samples is compiled in the attached table.

Additionally, selected sediment samples will be analyzed for geotechnical parameters, and any seep samples will be analyzed for general water quality parameters, in accordance with Section 5.9 of the Facility Investigation Work Plan.

If you have any questions, please feel free to contact me at (512) 494-0333.

Sincerely,
GEOMATRIX CONSULTANTS, INC.

Mark P. Hemingway
Principal Hydrogeologist

cc: Mr. Peter V. Palena, The Rohm and Haas Co.
Mr. Todd Quillen, TechLaw Inc.

Attachment

Target Analyte List
Sediment and Seep Analysis
Morton International, Inc.
Reading, Ohio
Facility Investigation

1,1-Dichloroethane	Endrin
1,2-Dichloroethane	Endrin aldehyde
Acetone	Endrin ketone
Benzene	Heptachlor
Bromodichloromethane	Heptachlor epoxide
Carbon disulfide	Isodrin
Chlorobenzene	Aluminum
Chloroform	Antimony
Chloroethane	Arsenic
Dichlorodifluoromethane	Barium
Ethylbenzene	Beryllium
Methylcyclohexane	Cadmium
Methylene chloride	Calcium
Toluene	Chromium
Xylenes (total)	Cobalt
1,2-Dichlorobenzene	Copper
1,4-Dichlorobenzene	Cyanide, Total
2-Methylphenol	Iron
4-Methylphenol	Lead
Aniline	Magnesium
Benzaldehyde	Manganese
Aldrin	Mercury
alpha-Chlordane	Nickel
alpha-BHC	Potassium
beta-BHC	Selenium
delta-BHC	Sodium
4,4'-DDD	Sulfide
4,4'-DDE	Thallium
4,4'-DDT	Tin
Dieldrin	Vanadium
Endosulfan I	Zinc
Endosulfan II	

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF

DE-9J

June 21, 2001

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Peter V. Palena
Corporate Remediation Manager
Rohm and Haas Company
P.O. Box 584
Route 413 and State Road
Bristol, Pennsylvania 19007

Re: RCRA § 3013 Administrative Order
Morton International, Inc.
U.S. EPA ID No. 000 724 138

Dear Mr. Palena:

The United States Environmental Protection Agency (U.S. EPA) has completed review of the Facility Investigation (FI) Work Plan for Morton International Inc. (Morton), Revision 01. The work plan was submitted by Geomatrix Consultants, Inc. on behalf of Morton pursuant to the requirements of the Administrative Order.

As presented below, the agency's review identified a remaining deficiency with respect to the ecological risk assessment.

Section 6.1.2, Analysis (refer to U.S. EPA's January 30, 2001, letter, Comment 22): U.S. EPA requested that the text of Section 6.1.2 be modified to indicate how toxicity to ecological receptors and site history would be used to identify constituents of potential concern (COPCs) for the ecological risk assessment. In response, Morton requested clarification on how these two considerations would be incorporated into the COPC selection process. During a recent conference call, U.S. EPA clarified that a compound considered an essential nutrient for humans but potentially toxic to an ecological receptor is to be included as a COPC. Consideration of site history would ensure that all chemicals used at the site or known or suspected to have been released at the site would at least be considered preliminary COPCs (certain preliminary COPCs may later be excluded based on

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the methodology appropriately presented in this section). In revising Section 6.1.2, Morton did not provide the requested modification. Therefore, in accordance with the U.S. EPA comment, Section 6.1.2 is to be modified as follows:

> A preliminary list of chemical stressors and their suspected sources will be developed from a list of the chemicals used at the facility. The list will include those chemicals known or suspected to have been released. From this list, COPCs for the ecological risk assessment will be selected based on the inherent toxicity to ecological receptors and the ability to biomagnify or bioaccumulate. Only chemicals that are detected above background levels in 5 percent or more of samples will be considered for COPC selection (see discussion of background in Section 5.14 of the FI Work Plan, and Section A1.4.2 and A1.4.3 of the Quality Assurance Project Plan (QAPP) from Appendix A).

In addition, upon further review of Section 10, Bibliography, it is requested that the bibliographic content from this section be compared against the human health guidance found at http://www.epa.gov/superfund/program/risk/tooltrad.htm and any necessary bibliographic corrections and/or updates be provided.

By July 16, 2001, Morton shall submit to U.S. EPA the above final revisions to the FI Work Plan. Upon final approval, U.S. EPA will issue signatures for the QAPP approval form.

If you have any questions regarding this letter, please contact me at (312) 886-7567 or at "capiro.mirtha@epa.gov".

Sincerely,

Mirtha Capiro
Project Coordinator/Manager
Enforcement and Compliance Assurance Branch

cc: Thomas C. Nash, C-14J
Mark Hemingway, Geomatrix Consultants, Inc.

PPalena@rohmhaas.com

06/20/01 11:07 AM

To: annehaikola@hotmail.com, Mirtha Capiro/R5/USEPA/US@EPA, mhemingway@geomatrix.com

cc:

Subject: Access to Pristine and Cincinnati Drum wells

Mirtha,

The following is a desription of the efforts made to obtain access to wells located on the Pristine Superfund site and the Cincinnati Drum properties.

On February 7th, 2001, Mark Hemingway, Ron Lantzy and I met with representatives of the Pristine Superfund trust including the technical consultant, Conestoga Rovers Associates (CRA). They told us that we could access the wells on the site using their access agreements with Cincinnati Drum Services (CDS). We would provide CRA with a list of personnel that would be accessing the site and CRA would notify CDS. Wells are located on the Pristine Site (property is owned by CDS) and the CDS site.

I received a call on 2/9 from Henry Cooke (CRA Project Manager). He stated that they discussed our access with their attorneys and that we would not be allowed to use their access agreements and that we should pursue our own agreement with CDS.

Plant personnel then contacted Tim Hobb, a manager at the CDS facility. Mr. Hobb informed them that any access agreements would have to be negotiated with the owners of the facility, the Long brothers.

I placed a call to Oren Long and left a message for him describing the nature of my inquiry. I received a voice mail from Mr. Long informing me that I should discuss this issue with his brother Geoffery (sp?) Long. I tried on numerous occasion to contact Mr. Long but was told that he was not in the office or unavailable at the present time. I left a message with Mr. Long's assistant that I would be in the Cincinnati area March 20th through March 22nd and would like to schedule a face to face meeting. I never received a reply.

I spoke with David Kurland, corporate legal, about the access issue and he attempted to contact the Longs through their lawyer. Mr. Kurland placed a telephone call to the Longs' lawyer and as of May 31st, 2001 had not received a reply.

Mirtha Capiro

07/06/01 10:59 AM

To: Peter_V_Palena@rohmhaas.com
cc: mhemingway@geomatrix.com, annehaikola@hotmail.com, TQuillen@techlawinc.com, mwelly@techlawinc.com
Subject:

Peter,

We would like further information regarding some items from the Assessment at Locations of Geophysical Anomalies. This information is necessary prior to field implementation in order to facilitate appropriate oversight. The items in question are below. For simplification purposes, please provide some brief response on these items via e-mail (cc to Todd Quillen). I will return to the office on Wednesday July 11th and, if necessary, we could arrange a conference call to discuss your response. I am hoping the items as presented are straight forward. However, if you have questions prior to preparing a response while I am out of the office, please leave me a **voice mail message** at 312/886-7567. As you know, I will be at the Morton site on Monday July 9th.
Items:
a) Describe approach for determining the size and location of each trench during investigation of anomalies.
b) The proposed trench/test pit for Area E appears appropriate for confirming the interpretation of survey results. However, page 9 of the Technical Memorandum does not describe this proposed investigation. Please clarify this inconsistency.
c) Based on the results of the proposed geochemical analysis, U.S. EPA may revisit the proposed assessment, including the interpretation of anomalies, their significance and need for additional sampling. This item is for future consideration and no response is required at this time.

Thanks.

Mirtha

Mark Hemingway
<MHemingway@geomatrix.com>

07/19/01 09:39 AM

To: Mirtha Capiro/R5/USEPA/US@EPA, Peter_V_Palena@rohmhaas.com
cc: annehaikola@hotmail.com, TQuillen@techlawinc.com, mwelly@techlawinc.com
Subject: Response to Geophysical Assessment Questions.

Mirtha--

Peter requested that I provide you and TechLaw with a response to your questions.

a) Describe approach for determining the size and location of each trench during investigation of anomalies.

Response: Trenches will be cut using a conventional backhoe. Given that the maximum fill depth at the Former Swale Area is approximately 13 feet based on historical topographic maps, excavation will proceed to approximately that depth. It will transect the geophysical anomaly at three locations, spanning most or all of the diameter of the anomaly. For the smaller anomalies at other locations, the fill depths are lower. Maximum excavation depths of approximately 8 feet are proposed, and trenching would proceed across the entire width of the anomaly. All locations will be located by using surveyed or marked locations from the geophysical work as references.

b) The proposed trench/test pit for Area E appears appropriate for confirming the interpretation of survey results. However, page 9 of the Technical Memorandum does not describe this proposed investigation. Please clarify this inconsistency.

Response: The Technical Memorandum was prepared by the Geomatrix geophysical expert, and was not intended to provide a definitive list of subsequent investigation. Although this Memorandum provided some recommendations for investigation areas, Geomatrix and Rohm & Haas have elected to go beyond these recommendations to increase the level of confidence for investigation findings. Please rely on the letter (not the Memorandum) as our formal proposal for planned investigation.

c) Based on the results of the proposed geochemical analysis, U.S. EPA may revisit the proposed assessment, including the interpretation of anomalies, their significance and need for additional sampling. This item is for future consideration and no response is required at this time.

No response required.

Mirtha, please contact Peter or me if you have any further questions.

Sincerely,

MARK P. HEMINGWAY
Principal Hydrogeologist

Geomatrix Consultants, Inc.
1214 West 6th Street, Suite 201
Austin, Texas 78703

ph (512)494-0333
fx (512)494-0334
email mhemingway@geomatrix.com

-----Original Message-----
From: Capiro.Mirtha@epamail.epa.gov
[mailto:Capiro.Mirtha@epamail.epa.gov]
Sent: Friday, July 06, 2001 10:59 AM
To: Peter_V_Palena@rohmhaas.com
Cc: mhemingway@geomatrix.com; annehaikola@hotmail.com;

Agenda

Rohm and Haas - Cincinnati Facility
Discussion of Facility Investigation

June 13, 2001
2:00 PM to 3:30 PM
Conference Call
Telephone Number 877-877-7132
Passcode: 6499520
Confirmation: 4181681

Type of meeting:

Attendees:

Mirtha Capiro, USEPA Region 5
Todd Quillan, TechLaw
Mike Welly, TechLaw

Peter Palena, Rohm and Haas Company
Ron Lantzy, Rohm and Haas Company
Mark Hemingway, Geomatrix
Anne Haikola, Geomatrix

Agenda topics

2:00-2:15 PM	Summary of Work Completed to Date	Mark Hemingway
2:15-2:30 PM	Review of Variances and Clarifications[1]	Mark Hemingway
2:30-2:45 PM	Project Schedule	Mark Hemingway
2:45-3:15 PM	Major Decision Points[2] v Establish Sediment and Seep Sampling Parameter List v Establish Sampling Locations for Suspected Waste Burial Areas (confirmation of geophysical survey) v Establish Soil Background Sampling Locations v Establish Soil Background Sampling Parameter List v Modification of Sewer Investigation Plan v Locations for Supplemental Stratigraphic Borings and Monitoring Wells v Determine Need for to Monitor the Lower Aquifer	PPeter Palena
3:15-3:20 PM	Review Action Items	Peter Palena
3:20-3:30 PM	Meeting Summary	Peter Palena

1 A detailed description of the variances, nonconformances and clarifications were submitted as part of the First Progress Report.

2 Each of these is an issue that needs to be addressed prior to the specific field activity. Rohm and Haas will prepare a submittal to USEPA, which describes the proposed activity and the logic, with supporting data, used to describe the decision-making.

Summary of Phase 1 Work Completed To Date

[Reference Section 4.1 of FI Work Plan]

- Stratigraphic Borings – 9 advanced into the Lower Aquifer
- Upper Aquifer monitoring wells – 24 installed at 14 locations.
- Soil samples – 75 collected for geochemical and/or geotechnical analysis, in addition to QC samples.
- Sewer Camera Survey – Performed on approximately 1700 linear feet of the combined sewer system (SWMU 11)
- Geophysical Investigation—Performed on former swale area (SWMU 10)and five historical waste burial areas (Areas A, B, C, D, E, F).
- Mill Creek Reconnaissance – Performed March 21, 2001, within 48 hours of rainfall event.
- Plugging and abandonment – 14 obsolete monitoring wells
- Collected groundwater samples from the 24 new monitoring wells and from existing wells MW-EPA-1, -2, -3, and -4.

Summary of Phase 2 Work Completed To Date

[Reference Section 4.2 of FI Work Plan]

- Aquifer Communication Testing -- Installed transducers in eight Upper Aquifer monitoring wells to measure any changes resulting from the shutdown/re-start of the Pristine Superfund Site groundwater recovery systems.
- Mill Creek Reconnaissance – Performed May 30, 2001, within 48 hours of rainfall event.
- Optical Brightener Assessment of Mill Creek – Installed 11 well points with sorbent pads along creek east bank.
- Ecological survey – Visual evaluation by ecological risk assessor of Morton Facility vicinity, including Mill Creek.

PHASE 2 FACIL.. INVESTIGATION
MAY THROUGH OCTOBER 2001

Phase 2 Activity	Approx. Duration (Working Days)	28-May	4-Jun	11-Jun	18-Jun	25-Jun	2-Jul	9-Jul	16-Jul	23-Jul	30-Jul	6-Aug	13-Aug	20-Aug	27-Aug	3-Sep	10-Sep	17-Sep	24-Sep	1-Oct	8-Oct	15-Oct	22-Oct
Mill Creek Recon and Ecological Receptor Survey	1																						
Aquifer Testing -- Pristine Shutdown	15																						
Installation Supplemental Wells/Strat Borings	15																						
Groundwater Sampling -- New Wells	5																						
Background Soil Sampling	3																						
SWMUS & Suspected Waste Burial Areas Soil Sampling	10																						
CSS Mains -- Camera Survey	5																						
CSS-Related DPT Borings	5																						
Mill Creek Recon and Sediment Sampling	2																						
Creek Well Pad Construction and Well Installation	5																						
Trenching at Geophysical Anomalies	7																						
Aquifer Testing	5																						
Surveying of Phase 2 Locations	5																						
On-going Data Evaluation and Planning	--																						
On-going Analysis by STL	--																						

RICHARD BOICE
05/14/01 11:23 AM

To: ppalena@rohmhass.com
cc: Mirtha Capiro/R5/USEPA/US@EPA, Daniel Patulski/R5/USEPA/US@EPA
Subject: Current Conditions Report, Morton Internations, Inc., Reading, Ohio.

In cooperation with U.S. EPA, General Electric (in cooperation with the U.S. Air Force) has agreed to develop a ground water model for ground water in the vicinity of the General Electric plant in Reading, Ohio. General Electric has contracted with O'Brien & Gere Engineers to develop the model. Chuck Schalk of USGS, who has been developing a regional hydrogeological map for the entire bedrock valley that underlies General Electric, the Pristine site, Morton International and other areas, has suggested that available ground water information from the Pristine site and Morton International be provided to O'Brien & Gere for development of the model. I am arranging to ship documentation from the Pristine site, because I am U.S. EPA's project manager for the Pristine site.

I contacted Mirtha Capiro of U.S. EPA to obtain a copy of the Current Conditions Report for the Morton International facility in Reading, Ohio, which I understand includes most if not all of the ground water investigation information at the Morton International facility. Mirtha said that a Rohm & Hass representative agreed to send the Current Conditions Report directly to model developer. When I contacted you, you were agreeable to this. Following is the address of person in charge of developing the model:

Guy Swenson
O'Brien & Gere Engineers
P.O. Box 4873
5000 Brittonfield Parkway
Syracuse, New York 13221-4873

Thank you for your cooperation. If you have any difficulties with this request, feel free to contact me at (312) 886-4740.

1214 West Sixth Street
Suite 201
Austin, TX 78703
(512) 494-0333 • FAX (512) 494-0334

GEOMATRIX

March 30, 2001

Ms. Mirtha Capiro
Project Coordinator
U.S. Environmental Protection Agency
Region 5
77 W. Jackson Boulevard, DRE-9J
Chicago, Illinois 60604-3590

RE: Revision 01, Facility Investigation Work Plan and Quality Assurance Project Plan, Morton International, Inc., Reading, Ohio
RCRA Docket No. R3013-5-00-001

Dear Ms. Capiro:

At the direction of the Rohm and Haas Co., Geomatrix Consultants, Inc. (Geomatrix) is submitting the replacement pages for Revision 01 to the Facility Investigation Work Plan (FI Work Plan) and Quality Assurance Project Plan (QAPP) for the referenced facility. As you directed Mr. Palena of the Rohm and Haas Co. in your March 2, 2001 letter, we are submitting replacement text sections and Figure 4-2 for Revision 01 of the referenced report. Specifically, please replace or add the following to your copy(ies) of the:

Facility Investigation Work Plan

Geomatrix Consultants, Inc. Certification Page – revised
Table of Contents – revised
Acronyms and Abbreviations – new
Section 1.0 – revised
Section 3.0 – revised
Section 4.0 – revised
Section 5.0 – revised
Exhibits – new

Quality Assurance Project Plan (Appendix A of the Facility Investigation Work Plan)

Approvals – new
Table of Contents – revised
Acronyms and Abbreviations – new
Section 3.0 – revised
Field Operating Procedure C3 – revised

Please note that your signature and the signature of Mr. Brian Freeman are requested on the QAPP approval form. Once you both have completed your review, submit a copy of the signed approval form to Geomatrix. We will copy and distribute to report holders indicated in the carbon copy (cc) list below.

GEOMATRIX

If you have any questions, please feel free to contact Peter Palena at (215) 785-7085 or me at (512) 494-0333.

Sincerely,
GEOMATRIX CONSULTANTS, INC.

Mark P. Hemingway
Principal Hydrogeologist

cc: Mr. Peter V. Palena, The Rohm and Haas Co. (1 copy of Revision 01)
Mr. Eric L. Walker, The Rohm and Haas Co. (1 copy of Revision 01)
Mr. David C. Kurland, Esq., The Rohm and Haas Co. (1 copy of Revision 01)
Mr. John Koehnen, Tech Law Inc. (1 copy of Revision 01)

Attachments – 3 copies of Revision 01, February 2001

Mark Hemingway <MHemingway@geomatrix.com> on 03/06/2001 02:09:22 PM

To: Mirtha Capiro cc: 'Anne Haikola' , '"Peter_V_Palena@RohmHaas.Com"' , '"adanford@stl-inc.com"'
Subject: Project Personnel - Reading, Ohio

Dear Ms. Mirtha Capiro,

At the direction of Rohm and Haas Co., Geomatrix Consultants, Inc. is submitting this update regarding project personnel for the RCRA 3013 Administrative Order Facility Investigation. The approved Quality Assurance Project Plan (QAPP) specified the key individuals for the upcoming Facility Investigation at the Morton International, Reading, Ohio facility. The project organization was described in Section A.2.0 and outlined in Figures A2-1 and A2-2 of the QAPP. The purpose of this letter is to provide the USEPA with the names of personnel specified as "to be determined" in these figures. This includes field, laboratory, and drilling personnel.

The field personnel from Geomatrix Consultants, Inc will be:
Team Leader - Tim Jennings
Alternate Team Leader- Jim Eidem
Technical Staff - Erik Mansell, Julie So

Bowser-Morner has been selected as the drilling contractor. Bowser-Morner personnel will be:
Drillers and support personnel - Jim Nidzgorski, Tim Boehmer, Kenny Boehmer

The laboratory personnel from Severn Trent Laboratories will be:
Group Leaders - Tom Hula (semivolatiles) and Raymond Risden (pesticides, PCBs), Tom Stiller (volatiles), Patrick O'Meara (metals), Eric Miller (extractions), Kurt Ill (general chemistry), Brad Belding (report production), Jeff McMahon (geotechnical), Clark Pickell (dioxin/furans).

We will provide revised Figures A2-1 and A2-2 as part of the Revision 01 update to the Work Plan in QAPP. Should additional changes to the list of project personnel become necessary, we will provide you with timely updates. Please contact me with any questions at (512) 494-0333 if you have any questions regarding the project organization.

Thank you,
Mark Hemingway
Principal Geologist

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:

DE-9J

March 2, 2001

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Peter V. Palena
Corporate Remediation Manager
Rohm and Haas Company
P.O. Box 584
Route 413 and State Road
Bristol, Pennsylvania 19007

Re: RCRA § 3013 Administrative Order
Morton International, Inc.
U.S. EPA ID No. 000 724 138

Dear Mr. Palena:

The United States Environmental Protection Agency (U.S. EPA) has completed review of the draft revisions to the Facility Investigation (FI) Work Plan for the Morton International Inc. (Morton) facility, dated February 26, 2001. The draft revisions were submitted by Geomatrix Consultants, Inc. on behalf of Morton. As requested by U.S. EPA, Morton will prepare and submit additional revisions to the proposed risk assessment from the FI Work Plan by April 6, 2001. In addition, U.S. EPA has reviewed your February 28, 2001, letter with a request to utilize Severn Trent Laboratories, North Canton, Ohio, for this project. Your letter includes supportive documentation from a recently completed laboratory performance evaluation.

U.S. EPA hereby conditionally approves the FI Work Plan based upon Morton's adequate revision of the proposed risk assessment. Please submit replacement text sections and Figure 4-2. In addition, U.S. EPA hereby approves Severn Trent Laboratories as the provider of laboratory services for this project. Morton should implement field work in accordance with the schedule from the FI Work Plan.

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If you have any questions regarding this letter, please contact me at 312/886-7567.

Sincerely yours,

Mirtha Capiro
Enforcement and Compliance Assurance Branch
Waste, Pesticides and Toxics Division

cc: Harold O'Connell, OEPA
Amy F. Bohler, OEPA
Thomas C. Nash, C-14J
Bruce Baiser, Rohm and Haas

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:

JAN 30 2001

DE-9J

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Peter V. Palena Jr.
Corporate Remediation Manager
Rohm and Haas Company
P.O. Box 584
Route 413 and State Road
Bristol, Pennsylvania 19007

Re: RCRA § 3013 Administrative Order
Morton International, Inc.
U.S. EPA ID No. 000 724 138

Dear Mr. Palena:

The United States Environmental Protection Agency (U.S. EPA) has reviewed and prepared comments on the Facility Investigation (FI) Work Plan for Morton International Inc. (Morton), Revision 00. The workplan was submitted by Geomatrix Consultants, Inc. on behalf of Morton pursuant to the requirements of the Administrative Order. The U.S. EPA comments are enclosed.

Please contact me to set up a conference call to discuss the U.S. EPA comments and agree upon a schedule for submittal of a revised FI Work Plan. To avoid field delays, it would be appropriate for Morton to prioritize those work plan revisions associated with the initial field work.

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If you have any questions regarding this letter, please contact me at (312) 886-7567 or at "capiro.mirtha@epa.gov".

Sincerely,

Mirtha Capiro
Project Coordinator/Manager
Enforcement and Compliance Assurance Branch

Enclosure

cc: Thomas C. Nash, C-14J
Mark Hemingway, Geomatrix Consultants, Inc.

COMMENTS FROM THE
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (U.S. EPA)
ON THE
FACILITY INVESTIGATION (FI) WORK PLAN
FOR
MORTON INTERNATIONAL, INC.
READING, OHIO
EPA ID NO. OHD000724138
(REVISION 00)

1. **General.** The FI Work Plan does not contain a list of acronyms used in the Work Plan. An acronym list would facilitate understanding portions of the Work Plan. Please revise the FI Work Plan to include a list of acronyms.

2. **Section 1.0, Introduction.** The third paragraph indicates that the FI Work Plan and Quality Assurance Project Plan (QAPP) have been prepared in accordance with the requirements of the Administrative Order (AO). This is consistent with a Morton's September 18, 2000, Response to Order Requiring Monitoring, Testing, Analysis and Reporting. For completeness, this section should reference Morton's response. In addition, it would be appropriate to include a copy of the response as an attachment to the FI Work Plan.

3. **Section 3.0, Goal 1.** The last bullet should be revised to include the identification of any past and continuing releases to groundwater and soils from Morton Facility sources.

4. **Section 4.2, Phase 2 Field Investigation.** It would be appropriate for Section 4.2 and other applicable sections to discuss the field tools and methods that will be utilized to evaluate surface water runoff during the FI as indicated in Section 7.3.3.1, Sources, Mechanisms of Releases, and Mechanisms of Transport.

5. **Section 4.2, Phase 2 Field Investigation.** The third bullet on page 5 in Section 4.2 of the FI Work Plan specifies that soil borings or trenches will only be installed at those historic waste burial locations where geophysical surveys indicate the presence and location of buried waste. This suggests that soil samples will not be collected from Waste Burial Areas A through G if no significant anomalies are detected during the geophysical surveys. Considering the past uses of some of the waste burial areas such as burning of waste solvents and potential undocumented uses, it would not be appropriate to eliminate soil sampling based on the results of the geophysical surveys. However, the results of

the geophysical surveys can be used to define the scope of soil sampling efforts at each of the burial areas. For example, a smaller number of soil sampling locations will be required at burial areas associated with no geophysical anomalies. Please revise the work plan based on this comment. Also, Section 5.1, Soil Borings, should be revised accordingly.

6. **Section 4.2, Phase 2 Field Investigation.** The fifth bullet on page 5 in Section 4.2 of the FI Work Plan states that "sampling of any Phase 2 wells installed after November 1, 2001 will be postponed until the Phase 3 groundwater sampling event in December 2001." As stated in Section 4.3, Phase 3 Field Investigation, "the primary focus of Phase 3 is to close any critical data gaps in the groundwater evaluation...." Sampling Phase 2 wells during the Phase 3 sampling event will apparently not allow the results of the Phase 2 well installation to be considered prior to Phase 3. The FI Work Plan should be revised to clearly indicate that any data gaps that are identified associated with Phase 2 wells sampled during the Phase 3 sampling event may be addressed in a manner similar to those Phase 2 wells sampled during the Phase 2 sampling event.

7. **Section 4.2, Phase 2 Field Investigation.** The seventh bullet on page 5 in Section 4.2 of the FI Work Plan states that an evaluation of vertical hydraulic communication will be performed at locations where upper aquifer wells are proximal to Pristine lower aquifer wells or clusters. The text does not explain why these locations would be best suited for this type of evaluation in terms of site-specific hydrogeologic conditions. The FI Work Plan should be revised to include criteria for selection of well locations as part of the proposal for evaluating vertical hydraulic communication. Information on existing well locations should be incidental to the selection criteria.

8. **Section 4.3, Phase 3 Field Investigation.** The scope of Phase 3 should include collection of soil samples to address any data gaps as necessary for determining the nature and extent of soil contamination. It is not clear whether the collection of soil samples from monitoring well borings may fully satisfy this requirement. Provide appropriate revisions to the FI Work Plan to address soil data gaps. Also, refer to U.S. EPA comment 10.

9. **Section 5.2, Soil Sampling.** Section 5.2 states that soil samples collected from the upper three feet will be

considered to represent surface soils. The use of this depth range to represent surface soils for the risk assessment is not adequately justified in the FI Work Plan. For the determination of risk at the facility, the concentration of site contaminants in surface soils must be determined. However, the interval that is used to represent surface soils should be a site specific determination based on site contaminants and soil characteristics. For example, if metals or polynuclear aromatic hydrocarbons (PAHs) are the predominant site contaminants in an area, or if the soil has a high clay content or a high organic carbon content it seems likely that a three foot sampling interval may have a dilutionary effect relative to samples collected from the upper six inches or upper one foot. If volatile organic compounds (VOCs) are expected to be the predominant site contaminant and the soil is sandy or gravelly, samples from the upper one foot may have been affected by volatilization and therefore may not be representative of the contaminants remaining in the area. In this situation, samples from the upper three feet may be representative. The FI Work Plan should be revised to address the rationale for the interval selected to represent surface soil during the FI investigation. The rationale that is provided should consider the conservatism that will be associated with the risk assessment. If the depth range for surface soils is modified based on the considerations presented above, the depth range for background surface soil samples should be modified appropriately.

10. **Section 5.2, Soil Sampling.** Section 5.2 describes the rationale for collecting soil samples at the Morton site. Primarily the discussion in Section 5.2 considers the depth intervals that soil samples will be collected within soil borings at the site during the initial sampling events at each study area. For example, Section 5.2 states that samples will be collected from the upper 3 feet of the core and then from the 3 to 15 foot interval depending on field indications of chemical impact, the position of the interface between the saturated and unsaturated zones, or at a depth of 15 feet below ground surface (bgs). Paragraph 57(C) of the AO requires that soil sampling be conducted to determine the "nature and <u>extent</u> of any soil contamination in and around" the study areas at the site. The sampling procedures presented in Section 5.2 of the FI Work Plan do not adequately describe how the lateral and vertical extent of contamination will be determined following the initial characterization. The FI Work Plan should be revised to clearly present how the extent of contamination will be

determined both horizontally and vertically, if field indications and/or chemical analysis reveal contamination at the location of a particular soil boring. Specific characterization scenarios should be provided in the FI Work Plan, if appropriate, for study areas such as the Combined Sewer System, if sampling is determined to be necessary for portions of this area. In addition, as indicated in U.S. EPA comment 8, it is not clear whether the collection of soil samples from monitoring well borings may fully satisfy the requirement for determining the nature and extent of soil contamination.

11. **Section 5.4 and other applicable sections.** The FI Work Plan describes the phased approach that will be used during the FI to fill in data gaps identified during the FI process. However, portions of the FI Work Plan such as Section 5.4 do not include the addressing of potential data gaps with respect to determination of nature and extent of contamination in groundwater from the lower aquifer. The results from the Phase 1 and Phase 2 sampling and the aquifer testing should be evaluated to determine if groundwater sampling in the lower aquifer is warranted. The FI Work Plan should be revised to address this comment.

12. **Section 5.7, Groundwater Level Measurements.** Groundwater potentiometric maps from the Pristine site suggest that the upper aquifer at the Morton facility may be affected by the operation of the Pristine groundwater withdrawal system. Section 5.7 of the FI Work Plan does not address how the operation of the Pristine groundwater remediation system will be considered in the groundwater level measurements conducted during the FI investigation. Paragraph 57(A)(ii) of the AO specifies that "regional and facility specific groundwater flow patterns, recharge and discharge areas, and seasonal variations in the groundwater flow regime" be determined and described through the FI process. The FI Work Plan should be revised to address what steps will be taken to present a characterization of the groundwater potentiometric surface and vertical hydraulic gradients under non-pumping conditions, including seasonal variations.

13. **Section 5.8, Seep and Sediment Sampling.** This section indicates that if no active seeps or locations of apparently impacted sediments are identified during the visual reconnaissance of Mill Creek, sediment samples will be collected at least every 100 linear feet along the east creek bank at approximate elevations of historic seepage. Also, Section 4.3, Phase 3 Field Investigation, includes

visual reconnaissance of the east creek bank. It should be noted that local meteorological conditions and groundwater pumping in conjunction with the Pristine Site likely impact groundwater levels and the potential for active seeps to be present along Mill Creek, adjacent to and downstream from the Morton Facility. However, since seeps may be active intermittently due to meteorological conditions or changes in groundwater pumping rates, multiple visual reconnaissances of Mill Creek should be conducted multiple times throughout the year, under different conditions. If during the first visual reconnaissance no active seeps are found and seep sampling does not take place, follow-up reconnaissance should take place quarterly, at minimum, and during or shortly after significant rainfall events. All pertinent meteorological data and/or groundwater pumping data should be recorded during each visual reconnaissance. It may be appropriate to not collect seep samples if no active seeps are found after four quarters of observations. The FI Work Plan should be revised to propose multiple reconnaissance events, as described above, if no seeps are observed after an initial reconnaissance event.

14. **Section 5.8, Seep and Sediment Sampling.** Section 3.4 of the Current Conditions Report included in Attachment 1 of the FI Work Plan mentions that optical brightener waste may have been disposed of in the Former Swale Area. Optical brighteners may be useful hydrogeologic tracers in groundwater systems. Long wave length ultraviolet light may be used to detect optical brighteners in groundwater even when present only in small quantities. If it is determined that screening for optical brighteners may be useful for identifying groundwater seep locations along Mill Creek, the FI Work Plan may be revised to include this field screening procedure. Screening for optical brighteners may also be useful for identifying groundwater inputs into the combined sewer system or elsewhere on site if it is found that optical brighteners are present in the groundwater at the Morton facility.

15. **Section 5.8, Seep and Sediment Sampling.** Section 5.8 indicates that if seep samples are collected and the seep only produces turbid water during the sampling period, then field filtration will be utilized to generate a non-turbid sample for metals analysis. The objective of collecting the seep samples is to evaluate the nature and extent of groundwater contamination at the site as it is discharged through active seeps into Mill Creek. As described in the U.S. EPA *RCRA Ground-Water Monitoring: Draft Technical*

Guidance (EPA/530-R-93-001) dated November 1992, U.S. EPA does not recommend that groundwater samples used to determine statistically significant evidence of groundwater contamination be filtered in the field. Potential chemical changes that may occur during the filtering process could result in non representative soluble metals concentrations. If the turbidity of the groundwater from the seeps is considered a problem, some variation of a low-flow rate sampling procedures perhaps should be used, if possible, and appropriate Standard Operating Procedures provided in the QAPP. At the least, unfiltered samples should be collected in addition to the filtered samples in case the analytical results from the seep sampling is needed to assess risk at the site. The FI Work Plan should clarify Morton's understanding of the relative usefulness of total versus soluble metals in the determination of risk.

16. **Section 5.9, Seep and Sediment Analysis.** The proposed sediment sampling does not seem to consider the potential that some of the constituents present in sediments from Mill Creek may be common to the Morton facility and upstream sources. To address such consideration, the approach needs to be revised to allow for sampling at location(s) situated upstream of the Morton facility (this information should also be reflected in Figure 4-2). Alternatively, the text from this section should be revised to provide the basis for excluding sediment sampling at areas located upstream of the Morton facility.

17. **Section 5.9, Seep and Sediment Analysis.** The FI Work Plans should be revised to include any additional sampling that may be warranted in order to determine the nature and extent of sediment contamination in Mill Creek, including locations further downstream of the Morton facility.

18. **Section 5.9, Seep and Sediment Analysis.** The FI Work Plan should be revised to analyze seep and sediment samples for any degradation products that may be expected based on groundwater sampling results.

19. **Section 5.12, Aquifer Testing.** Section 5.12 proposes conducting pumping or slug tests at two well clusters during the FI investigation. The FI Work Plan does not indicate what criteria will be used to determine whether a well cluster will be analyzed by either a pump test or a slug test. In addition, the proposal to conduct pumping or slug tests at only two well clusters does not clearly establish that testing at only two well clusters will adequately

characterize hydraulic conductivity variability across the site in each of the hydrogeologic units which may be encountered. Obtaining an adequate understanding of the hydraulic conductivity at the Morton site is an essential aspect of the facility characterization process. The FI Work Plan should be revised to present additional justification for the hydraulic conductivity testing that will be conducted during the FI investigation. If it is determined that hydraulic conductivity testing is necessary at more than two well clusters in order to adequately account for variation at the site, the criteria that will be used to determine the locations for the hydraulic conductivity should be presented.

20. **Section 5.14, Background Evaluation.** This section should be revised to include a discussion on the development of background levels for surface water and sediments. Also, refer to U.S. EPA comments 30 and 49.

21. **Section 6.1, Problem Formulation.** The last bulleted item appearing at the top of page 2 of 6 reads "Screening of endpoints for ecological risk." This should be revised to read "Selection of endpoints for ecological assessment."

22. **Section 6.1.2, Chemical Fate and Transport.** Additional details are needed on how the bulleted items on page 3 of 6 will be used to identify constituents of potential concern (COPCs) for the screening-level ecological risk assessment (SERA). For example, it is not clear which of the five criterion must be satisfied in order for a constituent to be considered a COPC. Does a COPC have to satisfy all five items, more than one but less than five items, or a single item? Revise the discussion on page 3 to illustrate how the listed items will be used to identify COPCs for the SERA. In addition to the listed items, show how the toxicity to potential ecological receptors and the site history will be used in determining which chemicals will be addressed in the SERA.

23. **Section 6.2, Analysis.** This section indicates that the SERA will include the use of screening levels for surface water based on State of Ohio Water Quality Criteria (WQC) unless certain exceptions described in the text apply. The text does not specify what screening levels will be used for sediments. Please note that the Ohio WQC levels are designed to protect aquatic life exclusively and for that reason those levels are not appropriate for addressing protection of other wildlife that consume water or fish.

Based on the above, the SERA should use the Region 5 Ecological Data Quality Levels as screening values for surface water and sediments. Also, refer to U.S. EPA comments 20, 30 and 49 regarding the development of background levels for surface water and sediments.

24. **Section 6.2, Analysis.** For the EDQLs used in the screening-level ecological risk assessment, demonstrate that the exposure media and the exposure routes used in their derivation match or are adequately representative of those at the Morton facility.

25. **Section 6.2, Analysis.** The last sentence of Section 6.2 states that non-detect results will be considered detected at a value of one-half the reporting limit (RL). No further information is provided. Revise Section 6.2 to demonstrate that including non-detects at the level of one-half the RL offers a defensible basis for screening. Demonstrate that the proposed approach is equivalent or more conservative than the approach for handling non-detects outlined in Section 5.3.3 of RAGS, *When Only Some Samples in a Medium Test Positive for a Chemical*.

26. **Section 6.3, Risk Characterization.** The last paragraph of Section 6.3 indicates that an EDQL will be developed for any chemical that does not have a published EDQL. The text does not present the methodology that will be used to determine these values. Revise Section 6.3 to provide the assumptions and the details of the methodology that will be used to develop EDQLs.

27. **Section 7.0, Human Health Risk Assessment.** Section 7.0 of the FI Work Plan, Human Health Risk Assessment (HHRA), does not provide sufficient detail to demonstrate that the Morton risk assessment will adequately characterize hazards and risks to potential receptors. Among the areas where additional information is needed are: the identification and application of appropriate fate and transport models, identification and presentation of the equations and parameter values to be used in estimating receptor dose, and the analysis of uncertainty associated with the resulting hazard and risk estimates. Refer to more detailed comments on the HHRA below.

28. **Section 7.1, Approach.** The first paragraph of Section 7.1 of the FI Work Plan states that future residential development of the Morton facility will not be considered in the risk assessment. The determination of a potential

future land use scenario should follow the directive "Considering Land Use in the CERCLA Remedy Selection Process, U.S. EPA, May 25, 1995, OSWER Directive No. 9355.7-04". Based on this guidance, additional support and justification should be provided to support the conclusion that the Morton facility will remain in industrial use (e.g., zoning codes and discussion with town planners).

Also, institutional controls are to be established and maintained as part of the corrective action process to ensure that the land use will remain industrial in the future. EPA Region 5 guidance on institutional controls may be accessed at:

http://www.epa.gov/reg5oopa/rcraca/ic.htm

EPA national guidance is provided at:

http://www.epa.gov/superfund/resources/institut/guide.pdf

29. **Section 7.1, Approach.** The second paragraph of Section 7.1 indicates that "Lower Aquifer water beneath the facility is also being controlled by remediation system for the neighboring Pristine Superfund Site. Therefore, domestic use of off-site groundwater will not be evaluated in the HHRA." In addition, the text from Section 7.3.1.2 adds that the lower aquifer groundwater at the facility is already being controlled by the remediation system for the neighboring Pristine Superfund site. Please note that the remediation system for the Pristine Superfund site has been designed to address chemicals of concern associated with that particular site, including the development of a site-specific monitoring parameter list based on groundwater sampling results at the Pristine site (from monitoring locations upgradient from the Morton facility). Among other aspects, the results of the FI will determine whether any of the COPCs associated with the Morton facility are present in the groundwater from the lower aquifer and whether exposure to such COPCs exists. Therefore, the FI Work Plan should be revised to consider potential routes of exposure associated with domestic use of off-site groundwater. Also, refer to U.S. EPA comment 34.

30. **Section 7.2.2, Chemicals of Potential Concern.** The third paragraph of Section 7.2.2 indicates that a chemical detected in soil will be considered a chemical of potential concern if it exceeds the background concentration. The calculation of background concentrations is not discussed in

the FI Work Plan, rather, it is described in the Quality Assurance Project Plan. Revise the FI Work Plan to include a summary of the calculation of background concentrations for the purpose of identifying chemicals of potential concern. In addition, the FI Work Plan and QAPP should be revised to indicate that background evaluations must be reviewed by U.S. EPA.

31. **Section 7.2.2, Chemicals of Potential Concern.** The discussion at the bottom of page 4 indicates that Morton may calculate a Preliminary Remediation Goal (PRG) or Risk-Based Screening Level (RBSL) for chemicals that do not possess published values. The text states that "...USEPA procedures will be used ...if sufficient toxicity data are available." The text does not present these procedures. Revise Section 7.2.2 to identify, discuss, and present the procedures that will be used to calculate missing PRGs and RBSLs. Also, state how Morton will address chemicals not having PRGs, RBSLs, or "...sufficient toxicity data."

32. **Section 7.2.2, Chemicals of Potential Concern.** For the PRGs and RBSLs that will be used to identify COPCS for the human health risk assessment, demonstrate that the exposure media and the exposure routes used in their derivation match or are adequately representative of those at the Morton facility.

33. **Section 7.3.1.2, Land and Water Use.** The discussion at the top of page 7 states that the upper aquifer is not known to be a source of potable water. The statement, however, is not supported in the text. Revise the FI Work Plan to describe the analyses and research that was done to determine that the upper aquifer is not a known source of potable water. If such a discussion appears in other corrective action documents for the Morton facility, the discussion may be referenced rather than repeated in the FI Work Plan.

34. **Section 7.3.1.2, Land and Water Use.** The discussion in the next to last paragraph on page 7 states that potential exposure through ingestion of groundwater (as drinking water) will not be evaluated quantitatively in the risk assessment. This exposure route should not be eliminated unless the results of the FI show that a) site-related COPCs have not migrated into the lower aquifer, or b) site-related COPCs have migrated into the lower aquifer, but migration of those constituents will not cause concentrations to exceed Maximum Contaminant Levels (MCLs) at drinking water

supplies. Revise the human health risk assessment methodology to consider this potential exposure route.

35. **Section 7.3.2.1, On-Site Receptors.** Revise Section 7.3.2.1 of the FI Work Plan to include a description of the physical and administrative controls that have been implemented to eliminate potential exposures to trespassers. If such a description cannot be provided, revise the FI Work Plan to include a trespasser as a receptor in the human health risk assessment.

36. **Section 7.3.3.1, Sources, Mechanisms of Releases, and Mechanisms of Transport.** The discussion at the bottom of page 9 of the FI Work Plan states that the relevance of fugitive dust generation to the Morton facility will be re-evaluated during the facility investigation (FI). Field data should show if soil contamination exists in areas that would be prone to mechanical or wind-driven disturbances. The FI Work Plan should include an overview of the methods that will be used to assess exposures to fugitive dust in case the FI shows it to be relevant to Morton. Revise the Work Plan to provide this information.

37. **Section 7.3.3.1, Sources, Mechanisms of Releases, and Mechanisms of Transport.** The discussion on page 10 of the FI Work Plan states that the relevance of surface water runoff to the Morton facility will be evaluated during the FI. The Work Plan should include an overview of the methods that will be used to characterize the fate and transport of surface water runoff in the exposure assessment in case the FI shows it to be relevant to Morton. Revise the FI Work Plan to provide this information.

38. **Section 7.3.3.1, Sources, Mechanisms of Releases, and Mechanisms of Transport.** The last paragraph of Section 7.3.3.1 indicates that the ingestion of fish will be addressed in the exposure assessment if chemicals that bioaccumulate are detected in Mill Creek. The methods to be used in assessing this type of exposure are not presented. Revise the Work Plan to identify and discuss the methods and techniques that will be used to estimate exposures through the ingestion of fish. Ensure that all chemicals possessing the properties that are part of the equations governing this type of exposure are included in the assessment.

39. **Section 7.3.3.2, Exposure Points and Routes.** The discussion of exposure points and routes should be expanded to consider

both mechanical and wind-driven suspension of particulates in air as well as the potential exposure of construction workers to dermal contact, incidental ingestion, and, possibly, inhalation of volatiles from groundwater that seeps or floods into excavations. Revise the FI Work Plan to include these potential exposure routes.

40. **Section 7.3.3.3, Exposure Pathways.** The discussion of on-site receptors on page 11 indicates that industrial workers may be exposed to volatile COPCs from soil and groundwater that are released to indoor air. The FI Work Plan does not describe how indoor air concentrations due to volatilization of chemicals in soil and groundwater will be determined (Table 7-1 does indicate that the dispersion of contaminants in indoor air will be modeled using a box model). The Johnson-Ettinger model is available for estimating indoor air concentration. Revise the Work Plan to describe in detail how indoor air concentrations stemming from volatilization of chemicals in soil and groundwater will be estimated.

41. **Section 7.3.3.3, Exposure Pathways.** In addition to the potential exposure pathways listed in Section 7.3.3.3, construction workers could be exposed via wind borne dusts, and dermal contact with and incidental ingestion of groundwater in excavations. Revise the FI Work Plan to consider these pathways.

42. **Section 7.3.3.3, Exposure Pathways.** The FI Work Plan should be revised to note that if the FI indicates that contaminants related to the Morton facility have migrated into the lower aquifer, off-site residents could be exposed through the ingestion of groundwater.

43. **Section 7.3.3.3, Exposure Pathways.** The FI Work Plan should be revised to state that in addition to ingestion of fish, recreational users of Mill Creek could be exposed through dermal contact with surface water and sediments and incidental ingestion of surface water.

44. **Section 7.3.4.1, Exposure Point Concentrations.** According to Section 10 of the Work Plan, the references to (1992a) in the first paragraph on page 13 are to EPA's *Guidelines for Exposure Assessment*. The text reads like the references should be to the *Supplemental Guidance to RAGS: Calculating the Concentration Term*. Review these references and revise them as needed.

45. **Section 7.3.4.1, Exposure Point Concentrations.** The first paragraph on page 13 states that the appropriate equation for estimating exposure point concentration will be taken from the guidance document for each individual data set. The FI Work Plan, however, does not describe how the appropriate equation will be determined. Revise the Work Plan to describe how it will be determined that a data set should be analyzed using the equation for a normal distribution or a log-normal distribution.

46. **Section 7.3.4.1, Exposure Point Concentrations.** According to Section 10 of the FI Work Plan, the references to (1992b) in the last paragraph on page 13 are to the *Supplemental Guidance to RAGS: Calculating the Concentration Term*. The text reads like the references should be to EPA's *Guidelines for Exposure Assessment*. Review these references and revise them as needed.

47. **Section 7.3.4.1, Exposure Point Concentrations.** The last sentence of Section 6.2 states that non-detect results will be considered detected at a value of one-half the reporting limit (RL). No further information is provided. Revise Section 6.2 to demonstrate that including non-detects at the level of one-half the RL is equivalent or more conservative than the approach for handling non-detects outlined in Section 5.3.3 of RAGS, *When Only Some Samples in a Medium Test Positive for a Chemical*.

48. **Section 7.3.4.1, Exposure Point Concentrations.** The last paragraph on page 13 indicates that non-detect results will be considered detected at a value of one-half the RL. No further information is provided. As it is preferred that non-detects be considered at one-half the sample quantitation limit (SQL), revise this discussion to demonstrate that including non-detects at the level of one-half the RL will provide a defensible basis for all risk analyses. Demonstrate that the proposed approach is equivalent to or offers more protection than the approach for handling non-detects outlined in Section 5.3.3 of RAGS, *When Only Some Samples in a Medium Test Positive for a Chemical*.

49. **Section 7.3.4.1, Exposure Point Concentrations.** The text related to Surface Water and Sediment indicates that "If concentrations are detected in surface water and/or sediment above background levels, then exposure point concentrations

will be developed from samples collected from potentially affected areas." It is noted that Section 5.14 does not discuss the establishment of background concentrations for sediments and no discussion on the development of background levels for surface water and sediments is included in the QAPP. Additionally, Section 7.2.2 does not discuss the use of background levels for sediment screening. The FI Work Plan should be revised to address these deficiencies. The revised text should also indicate that U.S. EPA must review the background evaluation.

50. **Section 7.3.4.2, Exposure Equations.** Based on the discussion in Section 7.3.4.2, it is assumed that Morton will apply the referenced Annual Average Daily Dose (AADD) and Lifetime Average Daily Dose (LADD) equations as they are presented in the two cited guidance documents. It is preferred that Morton present all dose equations that will be used in the human health risk assessment in an appendix to the revised Work Plan. At a minimum, Morton must present those dose equations that differ from those provided in the governing guidance documents because of differing or modified parameters. Revise the FI Work Plan to present these equations.

51. **Section 7.3.4.3, Exposure Parameters.** The list of sources of exposure parameter values presented in Section 7.3.4.3 does not include the *Exposure Factors Handbook* (http://www.epa.gov/ncea/exposfac.htm). The *Exposure Factors Handbook* is the preferred source for parameter values to be used in risk algorithms taken from EPA guidance. Revise the FI Work Plan to indicate that exposure parameter values will be taken from the *Exposure Factors Handbook* as appropriate.

52. **Section 7.3.4.3, Exposure Parameters.** Section 7.3.4.3 includes a reference to (199b). Review and correct this reference in the revised FI Work Plan.

53. **Section 7.3.4.3, Exposure Parameters.** Within the revised FI Work Plan, provide a list of the exposure parameter values that will be used in each dose equation in the risk assessment. For values that are not taken from the *Exposure Factors Handbook*, provide the source of the value and the rationale for its use.

54. **Section 7.4, Toxicity Assessment.** Expand the discussion of lead exposures presented on page 16 of the FI Work Plan.

Additional details concerning how lead exposures will be assessed are needed. As part of the discussion, provide the criteria that will be used to determine if the Interim Soil Lead Guidance or the Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil will be used. Also, indicate whether the IEUBK model will be used as part of the lead assessment. Morton should review EPA's announced new standard for lead (see January 5, 2001 FEDERAL REGISTER 66 FR 1206, or see www.epa.gov/lead) and account for this standard in the revised FI Work Plan and during the FI process.

55. **Section 7.6, Uncertainty.** It is not clear from the discussion presented in Section 7.6 that the analysis of uncertainty performed by Morton will establish the level of confidence in the risk estimates determined and reported for the site and, thus, facilitate risk management decisions. The FI Work Plan should be revised to provide additional details concerning the identification and characterization of sources of uncertainty in the human health risk assessment. Guidance is available in sections 6.8, 7.6, and 8.4 of RAGS as well as other EPA risk assessment guidance documents.

56. **Table 7-1, Summary of Migration Pathway Models.** Table 7-1 indicates that a particulate emission factor (PEF) model will be used to estimate the exposure point concentration in air for the fugitive dust pathway. The details of how the model will be applied to the Morton facility are not provided. Revise the Work Plan to describe how the PEF model will be formulated and applied to the Morton facility.

57. **Table 7-1, Summary of Migration Pathway Models.** Table 7-1 indicates that a volatilization factor (VF) model or the Jury Behavior Assessment Model will be used to estimate the exposure point concentrations in air for the volatilization from soil and groundwater pathways. Neither the table nor the text of the Work Plan discuss how the most appropriate model for the Morton risk assessment will be determined. In addition, the Work Plan does not describe how these models will be applied to the Morton facility. Revise the FI Work Plan to describe how the VF and/or Jury Behavior Assessment models will be formulated and applied to the Morton facility. State and discuss the criteria that will be used to determine which model is most appropriate for the risk assessment.

58. **Table 7-1, Summary of Migration Pathway Models.** Table 7-1 indicates that a box model will be used to estimate the exposure point concentration in air after dispersion outdoors and indoors. The details of how the model will be applied in the Morton risk assessment are not provided. Revise the FI Work Plan to describe how the box model will be formulated and applied to outdoor and indoor dispersion at the Morton facility. For dispersion in outdoor air, demonstrate how the box model will generate defensible estimates of the air concentration compared to more refined EPA models available for use.

59. **Field Operating Procedure, C-3, Monitoring Well Development.** The Field Operating Procedure (FOP) included in the QAPP for monitoring well development requires the continued development of the monitoring well until field parameters (pH, specific conductance, temperature) stabilize, non-turbid water is generated, and the water removed exceeds twice the volume of water lost to the formation during the drilling process (for mud-rotary drilled wells). The Monitoring Well Development FOP in the QAPP does not specify whether a minimum volume of water will be established for well development for wells which were installed without adding any foreign materials (i.e., drilling water, muds). Also, the FOP does not establish turbidity target limits that may be considered reasonable for a well developed at the site. To clarify the well development procedures, the Well Development FOP should be revised to indicate whether a minimum purged volume of groundwater will be established during well development and the target turbidity level should be presented, if available.

60. **Appendix A, Quality Assurance Project Plan.** Please include a Title/Signature page and provide any appropriate revisions to ensure consistency with the rest of the work plan based on the above comments.

1214 West Sixth Street
Suite 201
Austin, TX 78703
(512) 494-0333 • FAX (512) 494-0334

GEOMATRIX

November 20, 2000

Ms. Mirtha Capiro
Project Coordinator
U.S. Environmental Protection Agency
Region 5
77 W. Jackson Boulevard, DRE-9J
Chicago, Illinois 60604-3590

RE: Facility Investigation Work Plan, Morton International Inc., Reading, Ohio
RCRA Docket No. R3013-5-00-001

Dear Ms. Capiro:

At the direction of the Rohm and Haas Co., Geomatrix Consultants, Inc. (Geomatrix) is submitting the Facility Investigation Work Plan (FI Work Plan) and Quality Assurance Project Plan (QAPP) for the referenced facility. This submittal, in addition to the Current Conditions Report submitted to USEPA on September 29, 2000, has been prepared to meet the requirements of the Administrative Order, paragraphs 57, 58, and 59.

If you have any questions, please feel free to contact me at (512) 494-0333.

Sincerely,
GEOMATRIX CONSULTANTS, INC.

Mark P. Hemingway
Principal Hydrogeologist

cc: Mr. Peter V. Palena, The Rohm and Haas Co.
Mr. Matt DeMaison, The Rohm and Haas Co.
Mr. David C. Kurland, Esq., The Rohm and Haas Co.
Mr. John Koehnen, Tech Law Inc.

Attachments – 3 copies of the Current Conditions Report

Mirtha Capiro
10/31/2000 11:23 AM

To: Peter_V_Palena@rohmhaas.com
cc: Thomas Nash/R5/USEPA/US, morton consultant

Subject: RCRA § 3013 Administrative Order
Morton International, Inc.
U.S. EPA ID No. 000 724 138

Dear Mr. Palena:

We have received your request for an extension for the submittal of the Site Investigation Work Plan for the Morton International Inc. (Morton) facility from November 13, 2000 to November 21, 2000, as per your October 30, 2000, electronic mail. As a clarification, Morton's proposed schedule pursuant to the Administrative Order includes submittal of a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Workplan by November 13, 2000.

We hereby approve your request for an extension for submittal of a RFI Workplan for the Morton facility from November 13, 2000 to November 21, 2000. This extension does not relieve Morton from its obligation to complete monitoring, testing, analysis, and reporting by June 1, 2000 pursuant to the Administrative Order.

If you have any questions regarding this letter, please contact me at 312/886-7567 or at "capiro.mirtha@epa.gov".

Sincerely yours,

Mirtha Capiro
Enforcement and Compliance Assurance Branch
Waste, Pesticides and Toxics Division

cc: Thomas C. Nash, C-14J
Mark Hemingway, Geomatrix

Peter_V_Palena@rohmhaas.com on 10/30/2000 02:39:00 PM

To: Mirtha Capiro, mhemingway, Ronald_J_Lantzy, David_C_Kurland
Subject: RCRA 3013 Investigation

Mirtha,

As we discussed earlier, I am requesting a extension for the submittal of the Site Investigation Work Plan from November 13, 2000 to November 21, 2000. This extension will assure a better work product will be submitted to the agency.

There are three reasons for the needed extension.

1.) Defiencies in the Proposed Laboratory Performance Evaluation (PE) Samples. USEPA Region 5 had some issues with the STL-North Canton laboratory's PE samples and resources had to be diverted from the Work Plan preparation to address these issues.

2.) Integrating a new Laboratory. As discussed in our previous meetings, to meet the aggressive schedule we would be using documents prepared for the West Alexandria, Ohio RCRA Facility Investigation. The transition from one STL laboratory (Buffalo) to another (North Canton) has been more difficult than anticipated and will take longer to incorporate the new laboratory's Quality assurance Plans.

3.) New drilling method to be incorporated into the Work Plan. Rotosonic drilling methods need to be added to the other drilling technologies that were used as part of the West Alexandria, Ohio RFI.

We understand the importance of the completing the investigation by the June 2002 deadline and believe that this extension will not adversely affect this deadline or starting field operations at the beginning of March 2001. This extension will allow us to submit a clear and concise Work Plan with associated Quality Assurance documents.

I would like to thank you for your consideration on this issue and look forward to working with you to complete this project in a timely and efficent manner. If you have any questions please do not hesitate to contact me at 215-785-7079.

Sincerely,

Peter V. Palena Jr.
Rohm and Haas Company
Corporate Remedial Project Manager

documents prepared for the West Alexandria, Ohio RCRA Facility Investigation. The transition from one STL laboratory (Buffalo) to another (North Canton) has been more difficult than anticipated and will take longer to incorporate the new laboratory's Quality assurance Plans.

3.) New drilling method to be incorporated into the Work Plan. Rotosonic drilling methods need to be added to the other drilling technologies that were used as part of the West Alexandria, Ohio RFI.

We understand the importance of the completing the investigation by the June 2002 deadline and believe that this extension will not adversely affect this deadline or starting field operations at the beginning of March 2001. This extension will allow us to submit a clear and concise Work Plan with associated Quality Assurance documents.

I would like to thank you for your consideration on this issue and look forward to working with you to complete this project in a timely and efficent manner. If you have any questions please do not hesitate to contact me at 215-785-7079.

Sincerely,

Peter V. Palena Jr.
Rohm and Haas Company
Corporate Remedial Project Manager

Attendees List
RCRA 3013 Investigation Scoping Meeting
Rohm and Haas Cincinnati Facility
U.S. EPA ID No. OHD 000 724 138
16 October 2000

U.S. Environmental Protection Agency Region 5
77 W. Jackson Street Chicago, Il 60604
Room 812B

Initials	Name	Organization	Telephone	Email
MC	Mirtha Capiro	U.S. EPA Region 5	(312) 886-7567	Capiro.Mirtha@epa.gov
	~~Thomas C. Nash~~	~~U.S. EPA Region 5~~	~~(312)886-0552~~	~~nash.thomas@epa.gov~~
Not present	Brian Freeman	U.S. EPA Region 5	312-353-2720	freeman.brian@epa.gov
PP	Peter Palena	Rohm and Haas Company	(215) 785-7079	NAJXPP@ROHMHAAS.COM
RJL	Ron Lantzy	Rohm and Haas Company	(215) 785-7456	RONALD_J_LANTZY@ROHMHAAS.COM
MH	Mark Hemingway	Geomatrix Consultants, Inc.	(512) 494-0333	mhemingway@geomatrix.com

Agenda

RCRA 3013 Investigation
Scoping Meeting
Rohm and Haas Cincinnati Facility

10/16/2000
9:00 AM to Noon
U.S. Environmental Protection Agency Region 5
77 W. Jackson Street Chicago, Il 60604
Room 812B

Attendees:

Peter Palena, Rohm and Haas
Mark Hemingway, Geomatrix
David Kurland, Rohm and Haas
Brian Freeman, USEPA Region 5
Ron Lantzy, Rohm and Haas
Mirtha Capiro, USEPA Region 5
Thomas Nash, USEPA Region 5

Agenda topics

9:00-9:10 AM	Introductions/Meeting Overview	Peter Palena
9:10-9:30 AM	Summary of Investigation Primary Objectives	Mark Hemingway
9:30-10:45 AM	Scope/Schedule	Peter Palena

Phase I - Mar-May 2001
- UA Stratigraphic borings
- UA Wells
- GW Sampling
- Sewer Evaluation
- Geophysical Survey
- Mill Creek Reconnaissance
- Obsolete Well P&A

Phase II - July - Sept 2001
- SWMU and Burial Area Soil Borings
- Investigate Swale Anomalies
- Supplemental UA Well Installation
-
- Aquifer Testing
- Sediment/Seep Sampling
- Ecological Receptor Survey

Phase III – Nov - Dec2001
- Identify Human Receptors
- Final UA Well Installation
- GW Sampling
- Collect data for any gaps identified during Phase I & II

10:45-11:30 AM	Methods and Procedures	Mark Hemingway

Field
- Drilling
- Geophysical
- Sewer Evaluation
- Sampling

Analytical
Quality Control

11:30-11:50 AM	November 2000 Document Submittals	Mark Hemingway

- Investigation Work Plan
- Health and Safety Plan
- QA/QC Plan including Laboratory QC Plan

11:50-12:00 PM	Meeting Summary	Peter Palena

100 INDEPENDENCE MALL WEST, PHILADELPHIA, PA 19106-2399 USA
TELEPHONE (215) 592-3000 CENTRAL FAX (215) 592-3377

ROHM AND HAAS

David C. Kurland, Esq.
Tele: (215) 592-3691
Fax: (215) 592-3227
E-mail: David_C_Kurland@RohmHaas.com

September 18, 2000

Via Facsimile (312) 886-7160
and Overnight Courier
Airbill # 1009412 6453

Ms. Mirtha Capiro
Enforcement and Compliance Assurance Branch
Waste, Pesticides and Toxics DivisionU.S.
Environmental Protection Agency
Region 5 (DE-9F)
77 West Jackson Street
Chicago, Illinois 60604-3590

Mr. Thomas Nash
US Environmental Protection Agency
Region 57
7 West Jackson Boulevard C-14J
Chicago, IL 60604-3590

Re: RCRA Docket No. R3013-5-00-001

Morton International Inc.'s Proposal for Carrying Out Monitoring, Testing, Analysis and Reporting, and
Response to Order Requiring Monitoring, Testing, Analysis and Reporting

Morton hereby submits the attached Proposal for Carrying Out Monitoring, Testing, Analysis and Reporting ("Proposal"), as required by the Order Requiring Monitoring, Testing, Analysis and Reporting, RCRA Docket No. R3013-5-00-001 ("Order"). As agreed at our September 11, 2000 meeting, the Proposal sets forth a schedule by which Morton will submit a Current Conditions Report for the facility, and Workplans for the work required by Section VI of the Order, followed by the implementation of the Workplans and final reporting. The investigation is scheduled for completion by the June 1, 2002 date set forth in the Order, with input and cooperation of EPA. Morton presented a draft of the Proposal by letter dated August 31, 2000 from Mr. Kurland of Rohm and Haas to Ms. Capiro and Mr. Nash of EPA. In a conference in EPA's offices on September 11, 2000, EPA requested certain modifications to the Proposal which Morton has included in the attachment. Morton and EPA agreed at that time that the Proposal

under paragraph 57 of the Order. In addition, this letter constitutes Morton's written response to certain other matters in the Order.

Parties Bound

In Section II of the Order EPA sets forth the parties it believes are bound by the Order. Under RCRA § 3013 EPA may only issue an order to an owner or operator of a facility. Therefore, the Order applies only to Morton. While Morton will provide a copy of the Order to third parties to the extent necessary to carry out the work required by Section VI of the Order, Morton's engagements with its consultants do not condition contracts on consultants' compliance with the Order because the Order is not binding upon such consultants.

Findings of Fact

Section III of the Order sets forth EPA's Findings of Fact which are based on existing data. Morton will submit a Current Conditions Report on October 2, 2000 that will summarize the most current and accurate data available to date with regard to environmental conditions at the facility. Thereafter, the work that Morton will perform pursuant to Section VI of the Order will refine the existing data and complete any data gaps.

However, Morton notes specifically one omission and one error in the Order.[1] Most importantly, the Order makes no mention of the impact of the Pristine Superfund Site which lies directly to the north of and adjacent to the facility. As we discussed at our September 11 meeting, Pristine has caused contamination of soil and groundwater, has been thoroughly studied, and is undergoing remediation pursuant to a ROD. The lower aquifer under the Morton facility has been contaminated by Pristine, and it is likely that the upper aquifer under the Morton facility has been impacted by Pristine as well. The Pristine groundwater pump-and-treat system captures and controls contamination in the lower aquifer across the entire Morton site. Several recovery and monitoring wells associated with Pristine are located on the Morton facility. Pristine is almost certainly the cause of the production well closures noted in paragraph 14 of the Order, and the other referenced production wells are monitored frequently. Since the contamination in the lower aquifer has been defined and is under active remediation, Morton's proposed investigation will focus initially on defining and characterizing the upper aquifer.

Facts recited in the Order regarding ownership of the public recreation areas are incorrect. The public recreation area consisting of the city park, public pool, and municipal stadium are not owned by Morton, but rather are owned by the City of Reading. The baseball fields are on property owned by Morton, but are outside the facility security fence, and are managed and maintained by the City of Reading.

Workplan for Mill Creek

[1] By noting specific errors and omissions, Morton does not admit any other Findings of Fact In the Order.

It is expected that any seeps of groundwater from the Morton facility into Mill Creek were stopped by the operation of the french drain system, although the efficacy of that system will be evaluated during the course of this investigation. Morton notes that Mill Creek has been impacted by many activities both up and down stream and the substances previously detected in the creek sediments are common to many operations and sources in the area. Morton will attempt to distinguish any impact it may have had on the creek.

Workplans for Other Study Areas

Several of the study areas addressed in the Order have already been assigned a "low" release potential in the 1998 Preliminary Assessment conducted by EPA's contractor, TechLaw, specifically the former neutralization tanks and the former sulfide waste treatment tank. Also, the sewer system is extensive, and of varying ages and materials of construction. Morton's workplans will propose investigations that are tailored to the release potential at each individual study area and take the recommendations of the PA/VSI into account. For example, the sewer system will be evaluated to determine which sections carried potentially contaminated water and which sections have the potential for significant releases in order to focus the investigation. In addition, review of groundwater data from early phases of the investigation may indicate which sections of the sewer may be a source of contamination, and which sections can be relieved of further investigation.

Review of Submissions

In order to fulfill the requirements of the Order by the deadline of June 1, 2002, Morton and EPA will need to work together in a cooperative manner and engage in quick communication and decision making. The completion deadline can not be met if EPA reviews and approves or disapproves each submission in the manner contemplated by Section VII of the Order. The amount of time available for Morton and EPA to review data and plan subsequent phases will be quite limited, and preparation of extensive reports between phases for formal EPA review and approval will be impossible. Instead, Morton has proposed a multi-phased, data-driven approach that relies on regular submission of data and event summaries followed quickly by face-to-face meetings. Morton will provide the EPA with detailed schedules for each phase of the project so that the EPA can make available the appropriate resources for review of the data. At the end of the investigation, a final, complete report will be prepared and submitted for EPA review and approval. In the event that EPA disapproves a submittal, the time limits set forth in the Order should be evaluated to allow provide sufficient time for review, resubmission, and implementation.

Access

The access provision set forth in paragraph 74 is not consistent with 40 CFR § 270.30(i). In addition, all visitors to the facility are required to receive a safety orientation and follow facility safety rules. Morton proposes the following alternative language:

> 74. Morton shall allow the U.S. EPA, or its authorized representatives, upon the presentation of credentials and other documents as may be required by law to:

(1) Enter at reasonable times upon the Morton premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this Order;

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Order;

(3) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order; and

(4) Sample or monitor, at reasonable times, for the purpose of assuring compliance with this Order, any substances or parameters at this location.

(5) EPA and its contractors shall review and follow all facility safety rules while on Morton property.

Certification of Submissions

The certification required by paragraph 67 of the Order is not consistent with 40 CFR § 270.11(d). Morton will submit reports and other documents with the following certification by the Plant Manager, who is the responsible corporate official at this facility, or by the Project Manager, who has responsibility for the overall operation of the environmental investigation at the facility:

> I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Closure Requirements Applicable to Certain Units

The Order states that closure certification was not completed for SWMUs 2, 3 and 5. During the September 11 meeting we discussed whether those units are subject to closure requirements. It was agreed that Morton will investigate the requirements regarding RCRA closure of SWMUs 2, 3, and 5, and will take all appropriate action required by the regulations.

Dispute Resolution

Morton requests that EPA modify the Order to include a dispute resolution provision so that the parties have a quick, clear procedure to resolve differences without resorting to litigation and without jeopardizing Morton's ability to meet the deadlines in the Order. The following paragraph would be acceptable to Morton:

> In the event the Respondent disagrees, in whole or in part, with the EPA's disapproval or approval with modification of a submittal, the Respondent may notify the EPA Project Manager in writing within fifteen (15) days of receipt of the EPA's disapproval or approval with modifications. Such notice shall set forth the specific matters in dispute, the position the Respondent asserts should be adopted, the basis for the Respondent's position, and any other matters that may be necessary for EPA's determination. Respondent shall thereafter have the opportunity to meet and confer with the EPA Region 5 Waste, Pesticides and Toxics Division Director. The Division Director will issue a written decision resolving the dispute, which shall include a response to Respondent's notice, and which shall constitute final agency action. During the dispute resolution process Respondent shall take any action that is required by those portions of the submission that are not substantially affected by the dispute.

Force Majeure

Morton requests that the Order be modified to include a force majeure provision. The following paragraph would be acceptable to Morton:

> Deadlines and schedules imposed by or pursuant to this Order shall be extended during the occurrence of a force majeure. Respondent shall immediately notify EPA of any force majeure, and shall have the burden of proving such force majeure. Force majeure is defined as any event arising from causes which are not reasonably foreseeable, are beyond the control of Respondent, which can not be overcome by due diligence and which delays or prevents performance in the manner or by a date required by or pursuant to this Order. Such events do not include increased costs of performance, changed economic circumstances, reasonably foreseeable weather conditions or weather conditions which could have been overcome by due diligence, or failure to obtain federal, state or local permits unless Respondent demonstrates that timely application for such permits had been made in accordance with applicable statutory and regulatory requirements and such application has been diligently pursued.

Reservation of Rights

Morton submits the Proposal with the current intention to comply with the Order and cooperate with EPA to complete a phased, data-driven investigation of the facility by June 1, 2002. However, Morton reserves all rights and defenses it may have in law or equity with regard to the Order. Specifically, and without being limited or bound thereby, Morton does not agree with EPA's conclusion in Section V of the Order. To the contrary, the facts set forth in the Order are not sufficient to establish that the presence or

release of hazardous wastes from the facility may present a substantial hazard to human health or the environment, as is required by RCRA § 3013. Moreover, the facility is not a permitted or interim status transportation, storage or disposal facility and therefore is not subject to RCRA § 3013.

Thank you for your consideration of these matters. We have confirmed a meeting in EPA's offices on October 16, 2000 at 9:00 a.m. to discuss the Description of Current Conditions report (to be submitted on October 2, 2000) and to discuss the scope of the Phase I investigative work in detail. Please call me if you have any questions or concerns.

Sincerely,

David Kurland
Senior Counsel

DCK/vjc

cc: Joseph M. Boyle, EPA
Harold O'Connell, OEPA

ATTACHMENT A
MORTON INTERNATIONAL INC.'S PROPOSAL FOR CARRYING OUT MONITORING, TESTING, ANALYSIS AND REPORTING

Morton Facility, Reading, Ohio

Date	Activity	Purpose (Paragraph of Order Satisfied)
September 11, 2000	Initial Meeting	Refine schedule, discuss broad objectives and key facts
September 15, 2000	Submit Proposal for Monitoring, Testing, Analysis and Reporting	Define and schedule tasks (Order, ¶ 57)
October 2, 2000	Submittal of Current Conditions Report	Provide basic description of setting, history, and operations, to allow for proper scoping and review of RFI Work Plan
October 16, 2000	Scoping Meeting	Discuss preliminary review of CCR, describe and discuss proposed scope of RFI, including detailed scope of Phase 1 activities
November 13, 2000	Submittal of RFI Work Plan	Describe procedures, methods, locations, depths, etc. for RFI, including strategy and triggers for successive phases (Order ¶ 57, 58) Develop QA/QC and health and safety protocols (Order ¶ 59)
November 2000 through January 2001	Agency Review of RFI Work Plan and CCR	Allow for on-going review, discussion, and modification of investigation approach
March 2001 through May 2001	<u>Phase 1 of RFI</u> • On-Site Upper Aquifer Wells • On-Site Upper Aquifer Stratigraphic Borings • P&A Obsolete On-Site Wells • Groundwater Sampling • Combined Sewer System Evaluation	• Characterize hydrogeology of shallow aquifer (Order ¶ 57A) • Evaluate effectiveness of groundwater collection system (Order ¶ 57A) • Delineate on-site impact to shallow aquifer (Order ¶ 57E, F) • Characterize potential releases from sewer system (Order ¶ 57B)

MORTON INTERNATIONAL INC.'S PROPOSAL FOR CARRYING OUT MONITORING, TESTING, ANALYSIS AND REPORTING
(Continued)

June 2001	Scoping of Phase 2	Discussion and meetings between Morton and USEPA to review Phase 1 findings and plan details of Phase 2
July 2001 through September 2001	<u>Phase 2 of RFI</u> • Install Supplemental Upper Aquifer Wells • Groundwater Sampling • Aquifer Testing • Mill Creek Sediment & Seep Testing • SWMU Soil Borings • Geophysical Survey of Former Swale • Ecological Survey	• Complete on-site and off-site assessment of shallow aquifer. (Order ¶ 57A, E, F) • Characterize hydraulics of shallow aquifer, and communication with deeper aquifer (Order ¶ 57A, E, F) • Characterize soil impact at potential release sites (Order ¶ 57C) • Characterize residual or on-going impact from facility to creek (Order ¶ 57D) • Evaluate possible historical waste disposal in this area (Order ¶ 57C) • Identify potential ecological receptors (Order ¶ 57 A - F)
October 2001	Scoping of Phase 3	Discussion and meetings between Morton and USEPA to review Phase 2 findings and plan details of Phase 3
November 2001	<u>Phase 3 of RFI</u> • Characterization of Any Identified Human Receptors • Final Upper Aquifer Well Installation • Trenching or Drilling at Swale	• Provide information for HHRA (Order ¶ 57 A - F) • Close any remaining data gaps (Order ¶ 57 A - F) • Evaluate detected anomalies in Swale (Order ¶ 57C)
December 2001 through February 2002	Data Evaluation and RFI Report Preparation	Tabulate and interpret RFI findings (Order ¶ 57 A - F)
March 2002 through May 2002	Agency Review and Morton Revision of RFI Report	Provide RFI findings in a form suitable for agency and public review (Order ¶ 57 A - F)

Meeting regarding Morton International, Inc. ,
U.S. EPA ID No. OHD 000 724 138
September 11, 2000

Mirtha Capiro	U. S. EPA	312/886-7567
Thomas C Nash	USEPA	nash.thomas@epa.gov 312-886-0552
Peter Palena	Rohm and Haas Company	215/785-7079
David Kurland	Rohm and Haas Company	215.592.3691
Mark Hemingway	Geomatrix	512 494-0333

Geomatrix Consultants
Engineers, Geologists, and Environmental Scientists

Mark Hemingway
Principal Hydrogeologist

1214 West Sixth Street
Suite 201
Austin, TX 78703
E-mail: mhemingway@geomatrix.com
www.geomatrix.com

(512) 494-0333
Fax (512) 494-0334

Agenda
September 11, 2000 Meeting
RCRA Facility Investigation of Morton International, Inc. Facility, Reading, Ohio

GEOMATRIX

U.S. Environmental Protection Agency Region 5
and
The Rohm and Haas Co.

Basic Facility Background

- Setting
- History and Nature of Facility
- SWMUs and Other Waste Management Areas
- Basic Hydrogeology
- Areas of Known Impact to Environmental Media

Objectives and Scope of Administrative Order

- Ascertain the nature and extent of environmental impact
- Accomplish through RCRA Facility Investigation process
- Position facility for proper evaluation of Environmental Indicators by June 1, 2002

Anticipated RFI Scope

- Phased Approach
  - ✓ Planning Phase—August 2000 through February 2001
  - ✓ Field Phases 1, 2, 3—March through November 2001
  - ✓ Reporting Phase—November 2001 through May 2002
- Each Phase Building on Data from Previous

Anticipated RFI Schedule and Submittals

- Work Plan and Investigation Report Submittals
- Coordination and Scoping of Phases 2 and 3
- Progress Reporting
- Agency Review

Outstanding Legal Issues

Attachments

- Map of Facility with existing wells, SWMUs, and other on-site waste management areas
- Map of Sewer System
- Map of Vicinity with Pristine Wells
- Table of Scope Phases and Breakdown, with Schedule

RFI FIELD PHASE 1
March-May 2001

- Install On-Site Upper Aquifer Wells
- Drill On-Site Upper Aquifer Stratigraphic Borings
- P&A Older On-Site Upper Aquifer Wells
- Sample Groundwater On and Near Site
- Inventory and Test Combined Sewer

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RFI FIELD PHASE 2
July-September 2001

- Install Supplemental Upper Aquifer Wells
- Perform Aquifer Testing (Upper Aquifer/Lower Aquifer Communication)
- Sample Groundwater
- Sample Creek Sediment and Seeps
- Drill and Sample at Select SWMUs
- Perform Geophysical Survey of Swale
- Perform Eco Survey

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RFI FIELD PHASE 3
November 2001

- Human Receptor Characterization
- Final Upper Aquifer Well Installation
- Trenching or Drilling at Swale Anomalies

ROHM AND HAAS

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SUBMITTALS

- Current Conditions Report--October 2000
- RFI Work Plan--November 2000
  - Includes QAPP and HASP
- Progress Reports--April, July, October 2001
  - Includes Representative Analytical Data and Field Docs
- RFI Report--February 2002
  - Includes ERA and HHRA
  - Evaluation of Environmental Indicators

ROHM AND HAAS

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SCOPING MEETINGS

- October 2000--Planning for Phase 1
- June 2001--Planning for Phase 2
- October 2001--Planning for Phase 3

ROHM AND HAAS

GEOMATRIX

SITE VISIT AND MEETING
NOVEMBER 4, 1999

MIRTHA CAPIRO — U.S. EPA
RCRA CORRECTIVE ACTION

HAROLD O'CONNELL — (937) 285-6078
OHIO EPA / RCRA

Amy Gibbons Bohler — (937) 285-6054
Ohio EPA / DERR

TOM GENTNER — (312) 807-2366
ROHM & HAAS - CORP. REMEDIATION

RONALD LANTZY — (215) 785-7456
ROHM AND HAAS

GLENN SCHAAF
MORTON - ROHM & HAAS SITE MGR, EH&S 513-733-2132

MATTHEW DEMAISON
MORTON - ROHM & HAAS ; CINCINNATI FACILITY ENV. ENGINEER 513-733-2246

Morton

Thomas D. Gentner, P.E.
Director, Environmental Affairs

Morton International, Inc., 100 North Riverside Plaza
Chicago, IL 60606-1596 312/807-2366 Fax 312/807-3062
E-Mail: tom_gentner@corp.mortonintl.com

Ohio Environmental Protection Agency

DIVISION OF HAZARDOUS WASTE MANAGEMENT
Southwest District Office
401 East Fifth Street
Dayton, Ohio 45402-2911

(937) 285-6078 (Direct)
(937) 285-6000 (Division)
(937) 285-6249 (FAX)
E-Mail:Harold.OConnell@epa.state.oh.us

Harold R. O'Connell
Supervisor

Morton

Matthew A. DeMaison
Environmental Engineer
Morton Specialty Chemical Products

Morton International, Inc., 2000 West Street
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Morton

Glenn E. Schaaf, P.E.
Manager, Health, Safety & Environmental
Morton Specialty Chemical Products

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Cincinnati, OH 45215-3431 513/733-2132 Fax 513/733-2276

Ohio Environmental Protection Agency

DIVISION OF
EMERGENCY & REMEDIAL RESPONSE

Southwest District Office
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Dayton, Ohio 45402-2911

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~~(513)~~ 285-6012 Division
~~(513)~~ 285-6249 FAX

Amy F. Gibbons
Environmental Specialist
Bohler

RONALD J. LANTZY, Ph.D., P.G.
TECHNICAL FELLOW
PROFESSIONAL GEOLOGIST
HAZARD ASSESSMENT & ENVIRONMENTAL ENGINEERING

ROHM AND HAAS COMPANY
ENGINEERING DIVISION
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E-MAIL: RONALD_J_LANTZY@ROHMHAAS.COM

Morton

October 27, 1999

Ms. Mirtha Capiro
Environmental Scientist
Waste, Pesticides and Toxics Division
U.S. Environmental Protection Agency
Region 5
77 West Jackson Boulevard
Chicago, IL 60604-3590

RE: November 4th Site Inspection
Morton International Reading, OH Facility
MID 000 724 138

Dear Mirtha:

This letter is to confirm the site inspection for the referenced facility scheduled for November 4, 1999 at 10:00 A.M. I have attached a map with directions to the site for your convenience. When you arrive at the site, please sign in at the guardhouse and ask for Glenn Schaaf.

Joining us at the site for the inspection will be Glenn Schaaf and Matt DeMaison from the plant and Ron Lantzy from the Engineering Division in Bristol, PA.

I propose the following agenda which of course can be modified to suit your needs.

- Introductions and brief overview of site operations.
- Plant Tour. Focus will be on SWMU's and AOC's identified in the VSI report.
- Review of groundwater investigations conducted at the site.
- Review of groundwater recovery and treatment system.
- Discussion of RCRA Corrective Action process going forward.

I look forward to meeting with you at the site. Should you have any questions prior to the meeting, please do not hesitate to call me at (312) 807-2366.

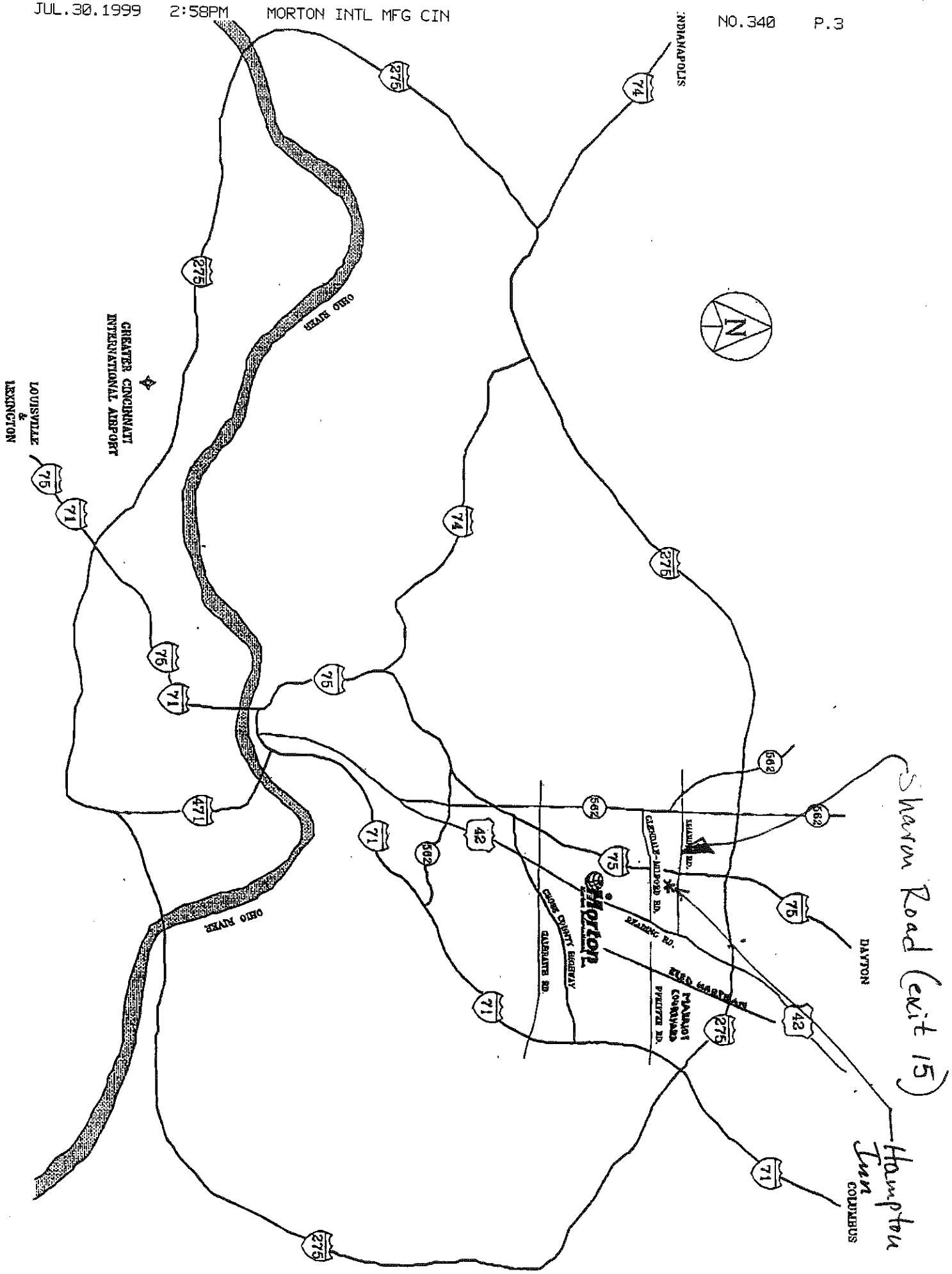
Sincerely,

Thomas D. Gentner

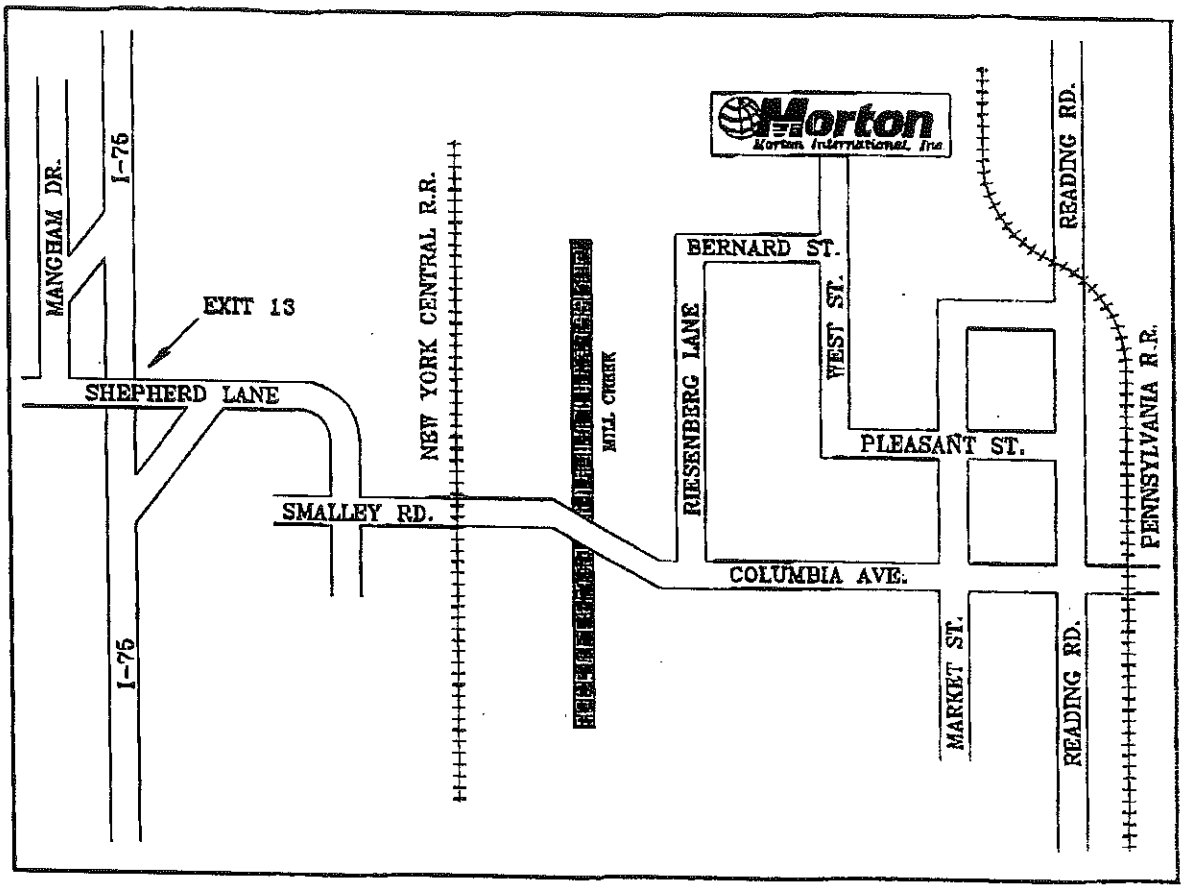
Thomas D. Gentner, P.E.
Remedial Project Manager

encl

Cc: Glenn Schaaf – Cincinnati
Matt DeMaison – Cincinnati
Ron Lantzy – Bristol
Al Holmstrom – Bristol


INDIANAPOLIS
GREATER CINCINNATI INTERNATIONAL AIRPORT
LOUISVILLE & LEXINGTON
OHIO RIVER
OHIO RIVER
Morton
CROSS COUNTY HIGHWAY
GALBRAITH RD.
READING RD.
GLENDALE-MILFORD RD.
SHARON RD.
MARRIOT COURTYARD
PFEIFFER RD.
DAYTON
COLUMBUS
Sharon Road (exit 15)
Hampton Inn
N
74
275
75
71
471
42
562

MORTC] INTERNATIONA. DETAIL MAP



I-75 From the South (Kentucky or Airport)
Exit airport to I-275 East; Travel east on I-275 to I-71/I-75 North; Travel north on I-71/I-75 to I-75 North; I-75 North to Shepherd Lane Exit (Exit No. 13); Right on Shepherd Lane to Smalley Road; Left on Smalley Road to Riesenberg Lane; Left on Riesenberg Lane to Bernard Street; Right on Bernard Street to West Street; Left on West Street to plant entrance.

I-75 From the North (Dayton)
Travel south on I-75 to Shepherd Lane Exit (Exit No. 13); Left on Mangham Drive to Shepherd Lane; Left on Shepherd Lane to Smalley Road; Left on Smalley Road to Riesenberg Lane; Left on Riesenberg Lane to Bernard Street; Right on Bernard Street to West Street; Left on West Street to plant entrance.

I-71 From the South (Cincinnati or Harley Hotel)
Travel north I-71 to Cross County Highway West; Take Cross County Highway West to Ridge Road; Right on Ridge Road to Columbia Avenue; Straight on Columbia Avenue to Market Street; Right Market Street to Pleasant Street; Left on Pleasant Street to West Street; Right on West Street to plant entrance.

I-71 From the North (Columbus)
Travel south on I-71 to Cross County Highway West. Proceed on Cross County Highway. Follow instructions as in I-71 From the South (Cincinnati or Harley Hotel).

I-74 From the West (Indianapolis)
Travel east on I-74 to I-275 East. Take I-275 East to I-75 South. Proceed south on I-75. Follow instructions as in I-75 From the North (Dayton).

From Courtyard By Marriott (Blue Ash)
Left on Reed Hartman Hwy; Right on Pfeiffer Road (Glendale-Milford); Left on Reading Road; Right on Pleasant Street (Changes to West Street); Right on West Street to plant entrance.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

OCT 06 1999

REPLY TO THE ATTENTION OF
DE-9J

CERTIFIED MAIL:
RETURN RECEIPT REQUESTED

Thomas D. Gentner, P.E.
Director, Environmental Affairs
Morton International Inc.
100 North Riverside Plaza
Chicago, IL 60606-1596

RE: RCRA Corrective Action Evaluations in Response to Government Performance and Results Act
Morton International Inc., Reading, Ohio
MID 000 724 138

Dear Mr. Gentner:

Your facility is subject to either Sections 3004(u) or 3008(h) of the Resource Conservation and Recovery Act (RCRA). Corrective action may be required at your facility to address releases of hazardous wastes and/or constituents from solid waste management units (SWMUs). This letter is to inform you that the Morton International Inc. (Morton) facility in Reading, Ohio, has been scheduled for evaluation during the month of October by representatives from the United States Environmental Protection Agency (U.S. EPA), Region 5.

This effort is being initiated in order to ensure that your facility does not pose an environmental hazard to human health or the environment. Your facility has been included as a part of Region 5's Government Performance and Results Act (GPRA) Baseline of RCRA corrective action facilities. The Baseline list is made up of those facilities which are the highest corrective action priorities. Your facility will be evaluated in order to establish an accurate understanding of its environmental status. That status information will serve as a part of our determination of the next steps we must take.

Because the Morton facility is a GPRA Baseline facility for which RCRA corrective action has not been initiated, the U.S. EPA, Region 5 will conduct an evaluation of U.S. EPA and State RCRA files and will perform a visual site inspection of your facility. The site inspection of your facility is being scheduled for the month of October. I will be contacting you in order to schedule

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The site inspection of your facility is being scheduled for the month of October. I will be contacting you in order to schedule this site visit. Your cooperation and assistance will enable us to establish the best possible understanding of the environmental condition of your facility.

Please contact me at (312) 886-7567 if you have questions.

Sincerely,

Mirtha Capiro
Environmental Scientist
Waste, Pesticides and Toxics Division

cc: Harold O'Connell, OEPA

1214 West Sixth Street
Suite 201
Austin, TX 78703
(512) 494-0333 • FAX (512) 494-0334

GEOMATRIX

September 29, 2000

Ms. Mirtha Capiro
Project Coordinator
U.S. Environmental Protection Agency
Region 5
77 W. Jackson Boulevard, DRE-9J
Chicago, Illinois 60604-3590

RE: Current Conditions Report, Morton International Inc., Reading, Ohio
RCRA Docket No. R3013-5-00-001

Dear Ms. Capiro:

At the direction of the Rohm and Haas Co., Geomatrix Consultants, Inc. (Geomatrix) is submitting a Current Conditions Report for the referenced facility. As discussed in the September 11, 2000 meeting between representatives of the U.S. Environmental Protection Agency, the Rohm and Haas Co., and Geomatrix, the intent of the Current Conditions Report is to support subsequent work at the Morton Facility in Reading, Ohio. Specifically, the Current Conditions Report will facilitate effective planning and implementation of the investigation effort required by the Administrative Order.

We look forward to meeting with you on October 16, 2000 to discuss this Current Conditions Report and the proposed scope of the investigation required by the Administrative Order.

If you have any questions, please feel free to contact me at (512) 494-0333.

Sincerely,
GEOMATRIX CONSULTANTS, INC.

Mark P. Hemingway
Principal Hydrogeologist

cc: Mr. Peter V. Palena, The Rohm and Haas Co.
Mr. Matt DeMaison, The Rohm and Haas Co.
Mr. David C. Kurland, Esq., The Rohm and Haas Co.

Attachments – 3 copies of the Current Conditions Report