



CERTIFIED MAIL

John R. Kasich, Governor
Mary Taylor, Lt. Governor
Craig W. Butler, Director

September 29, 2014

Cytec Industries Inc.
5 Garrett Mountain Plaza
Woodland Park, NJ 07424

**Re: Cytec Industries Inc.
Permit - Short Term
RCRA C - Hazardous Waste
Washington County
OHD 004 341 509**

Dear Sir or Madam:

Here is the renewed Ohio Hazardous Waste Facility Installation and Operation Permit (Permit) for Cytec Industries Inc. I have also enclosed a copy of the Response to Comments Ohio EPA prepared in response to written comments the Agency received concerning the Part B permit application. The Permit is effective today, September 29, 2014. The date-stamped, page-numbered copy of the Part B permit application is also enclosed.

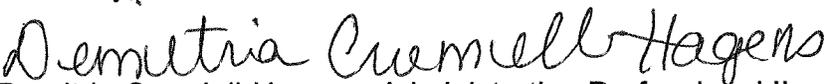
You are hereby notified that this action of the Director is final and may be appealed to the Environmental Review Appeals Commission pursuant to Section 3745.04 of the Ohio Revised Code. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. The appeal must be filed with the Commission within thirty (30) days after notice of the Director's action. The appeal must be accompanied by a filing fee of \$70.00 which the Commission, in its discretion, may reduce if by affidavit you demonstrate that payment of the full amount of the fee would cause extreme hardship. Notice of the filing of the appeal shall be filed with the Director within three (3) days of filing with the Commission. Ohio EPA requests that a copy of the appeal be served upon the Ohio Attorney General's Office, Environmental Enforcement Section. An appeal may be filed with the Environmental Review Appeals Commission at the following address:

Environmental Review Appeals Commission
77 South High Street, 17th Floor
Columbus, OH 43215

Cytec Industries Inc.
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If you have any questions concerning compliance, please contact Scott Bergreen of Ohio EPA's Southeast District Office at (740) 385-8501.

Sincerely,


Demetria Crumiell-Hagens, Administrative Professional II
Division of Materials and Waste Management

Attachments

cc: Brad Mitchell, DMWM, CO
Scott Hester, DMWM, CO
Jeremy Carroll, DMWM, CO
Ed Lim, DERR, CO
Todd Anderson, Legal
Mary McCarron, PIC
Donna Goodman, DMWM, SEDO
Dustin Tschundy, DERR, SEDO
Ed Lim, DERR, CO
Scott Bergreen, DMWM, SEDO
Joseph Goicochea, DMWM, SEDO

OHIO ENVIRONMENTAL PROTECTION AGENCY

SEP 29 2014

OHIO HAZARDOUS WASTE FACILITY ENTERED DIRECTOR'S JOURNAL
INSTALLATION AND OPERATION PERMIT RENEWAL

Permittee: **Cytec Industries Inc**

Mailing Address: **Cytec Industries Inc
5 Garret Mountain Plaza
Woodland Park, NJ 07424**

Owner: **Cytec Industries Inc
5 Garret Mountain Plaza
Woodland Park, NJ 07424**

Operator: **Cytec Industries Inc
1405 Greene Street
Marietta, OH 45750**

Location: **Cytec Industries Inc
1405 Greene Street
Marietta, OH 45750**

US EPA ID:	OHD004341509
Issue Date:	September 29, 2014
Effective Date:	September 29, 2014
Expiration Date:	September 29, 2024

AUTHORIZED ACTIVITIES

In reference to the application of Cytec Industries, Inc. for an Ohio Hazardous Waste Facility Installation and Operation Renewal Permit under Ohio Revised Code (ORC) Chapter 3734 and the record in this matter, you are authorized to conduct at the above-named facility the following hazardous waste management activities:

- Implement Corrective Action
- Conduct Post-Closure Activities

I certify this to be a true and accurate copy of the official documents as filed in the records of the Ohio Environmental Protection Agency.

PERMIT APPROVAL



 Craig W. Butler, Director
 Ohio Environmental Protection Agency

By  Date: 9-29-14

This permit approval is based upon the record in this matter which is maintained at the offices of the Ohio Environmental Protection Agency. The Director has considered the application, accompanying information, inspection reports of the facility, a report regarding the facility's compliance or noncompliance with the terms and conditions of its permit and rules adopted by the Director under this chapter, and such other information as is relevant to the operation of the facility. The Director has determined that the facility under the existing permit has a history of compliance with ORC Chapter 3734, rules adopted under it, the existing permit, or orders entered to enforce such requirements that demonstrate sufficient reliability, expertise, and competency to operate the facility henceforth under this chapter, rules adopted under it, and the renewal permit.

Entered into the Journal of the Director this 29th day of September, 2014.

By  of the Ohio Environmental Protection Agency.

MODULE A - GENERAL PERMIT CONDITIONS

A. GENERAL PERMIT CONDITIONS

A.1 Effect of Permit

ORC Sections 3734.02 (E) and (F) and 3734.05
OAC Rule 3745-50-58(G)

- (a) The Permittee is authorized to continue post-closure activities at two surface impoundments in accordance with the terms and conditions of this Ohio hazardous waste permit (hereinafter "permit"), ORC Chapter 3734, all applicable Ohio hazardous waste rules, all applicable regulations promulgated under the Resource Conservation and Recovery Act (RCRA), as amended, and the permit application. The permit renewal for Pond 1 and Pond 2 is for the purpose of accomplishing post-closure activities. These units are currently inactive and undergoing post-closure. These units shall not be reactivated for management of hazardous waste. The permit application, as submitted to Ohio EPA on December 18, 2013 and last updated on May 2, 2014, is hereby incorporated into this permit. In the instance of inconsistent language or discrepancies between the above, the language of the more stringent provision shall govern.
- (b) Any management of hazardous waste not authorized by this permit is prohibited, unless otherwise expressly authorized or specifically exempted by law. Issuance of this permit does not convey property rights of any sort or any exclusive privilege; nor does it authorize any injury to persons or property, or invasion of other private rights. Compliance with the terms and conditions of this permit does not obviate the Permittee's obligation to comply with other applicable provisions of law governing protection of public health or the environment including but not limited to the Community Right to Know law under ORC Chapter 3750.

A.2 Permit Actions

OAC Rule 3745-50-58(F)

This permit may be modified or revoked as specified by Ohio law. The filing of a request by the Permittee for a permit modification, or the notification of planned changes or anticipated noncompliance on the part of the Permittee, does not stay any permit term or condition.

A.3 Permit Effective/Expiration Date
OAC Rule 3745-50-54

The effective date of this permit is the date the permit is entered into the Director's Journal. The permit expiration date is ten years after the date of journalization of this permit.

A.4 Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

A.5 Duty to Comply
OAC Rule 3745-50-58(A)

The Permittee must comply with all applicable provisions of ORC Chapter 3734, all applicable Ohio hazardous waste rules, and all terms and conditions of this permit, except to the extent and for the duration such noncompliance is authorized by the laws of the State of Ohio. Any permit noncompliance, other than noncompliance authorized by the laws of the State of Ohio, constitutes a violation of ORC Chapter 3734 and is grounds for enforcement action, revocation, modification, denial of a permit renewal application or other appropriate action.

A.6 Duty to Reapply and Permit Expiration
OAC Rules 3745-50-40(D), 3745-50-58(B), 3745-50-56 and ORC Section 3734.05(H)

- (a) If the Permittee wishes to continue an activity allowed by this permit after the expiration date of this permit, the Permittee must submit a completed permit application for a hazardous waste facility installation and operation permit renewal and any necessary accompanying general plans, detailed plans, specifications, and such information as the Director may require, to the Director no later than one hundred eighty (180) days prior to the expiration date of this permit, unless a later submittal date has been authorized by the Director upon a showing of good cause.
- (b) The Permittee may continue to operate in accordance with the terms and conditions of the expired permit until a renewal permit is issued or denied if:
 - (i) the Permittee has submitted a timely and complete permit application for a renewal permit under OAC Rule 3745-50-40; and
 - (ii) through no fault of the Permittee, a new permit has not been issued pursuant to OAC Rule 3745-50-40 on or before the expiration date of this permit.

- (c) The Corrective Action obligations contained in this permit will continue regardless of whether the facility continues to operate or ceases operation and closes. The Permittee is obligated to complete facility-wide Corrective Action under the conditions of this permit regardless of the operational status of the facility. The Permittee must submit an application for permit renewal at least 180 days before the expiration date of this permit pursuant to OAC Rule 3745-50-40(D) unless a) the permit has been modified to terminate the Corrective Action schedule of compliance and the Permittee has been released from the requirements for financial assurance for Corrective Action; or b) a later submittal date has been authorized by the Director.

A.7 Need to Halt or Reduce Activity Not a Defense
OAC Rule 3745-50-58(C)

It shall not be a defense for the Permittee in an enforcement action that it would have been necessary to halt or reduce a permitted activity in order to maintain compliance with the conditions of this permit.

A.8 Duty to Mitigate
OAC Rule 3745-50-58(D)

The Permittee must take all reasonable steps to minimize releases to the environment and must carry out such measures as are reasonable to prevent significant adverse impact on human health or the environment resulting from noncompliance with this permit.

A.9 Proper Operation and Maintenance
OAC Rule 3745-50-58(E)

The Permittee must at all times properly operate and maintain the facility (and related appurtenances) to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance includes effective management practices, adequate funding, adequate operator staffing and training, and where appropriate, adequate laboratory and process controls, including appropriate quality assurance/quality control procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the terms and conditions of this permit.

A.10 Duty to Provide Information
OAC Rule 3745-50-58(H)

The Permittee must furnish to the Director, within a reasonable time, any relevant information which the Director may request to determine whether cause exists for modifying or revoking, or to determine compliance with, this permit. The Permittee must also furnish to the Director, upon request, copies of records required to be

kept by this permit.

A.11 Inspection and Entry

OAC Rules 3745-50-58(I), 3745-49-03 and 3745-50-30, and ORC Section 3734.07

- (a) The Permittee must allow the Director, or an authorized representative, upon stating the purpose and necessity of the inspection and upon proper identification, to:
 - (i) enter, at reasonable times, upon the Permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the terms and conditions of this permit;
 - (ii) have access to and copy, at reasonable times, any records required to be kept under the terms and conditions of this permit;
 - (iii) inspect and photograph, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under the terms and conditions of this permit; and
 - (iv) sample, document, or monitor, at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by ORC Chapter 3734 and the rules adopted thereunder, any substances or parameter at any location.
- (b) Any record, report or other information obtained under the hazardous waste rules or Chapter 3734 of the Revised Code shall not be available to the public upon the Permittee's timely submittal of a trade secret claim and satisfactory showing to Ohio EPA that all or part of the information would divulge methods or processes entitled to protection as trade secrets pursuant to Ohio Trade Secret Law and OAC Rules 3745-49-03 and 3745-50-30.

A.12 Monitoring and Records

OAC Rule 3745-50-58(J)

- (a) Any sample and measurement taken for the purpose of monitoring must be representative of the monitored activity. Further, a sample must be a representative sample, as such term is defined and used in the Ohio hazardous waste rules. The method used to obtain a representative sample of the waste to be analyzed must be the appropriate method from Appendix I of OAC Rule 3745-51-20, Laboratory Methods. Laboratory methods must be those specified in Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA Publication SW-846, Third Edition, as amended by Updates I, II, IIA, IIB, III and IIIA, and additional supplements or editions thereof; Standard Methods for the Examination of Water and

Wastewater: Twentieth Edition, 1999; or an equivalent method as specified in the approved waste analysis plan, or as this term is defined and used in the Ohio hazardous waste rules.

- (b) Records of monitoring information must specify the:
 - (i) date(s), exact place(s), and time(s) of sampling or measurements;
 - (ii) individual(s) who performed the sampling or measurements;
 - (iii) date(s) analyses were performed;
 - (iv) individual(s) who performed the analyses;
 - (v) results of the data validation review including: report completeness, chain of custody, sample receipt form, signed statement of validity, technical holding time review, data qualifiers including their definitions, dilutions, blank data, spikes, spike recovery %, surrogate recovery, and an explanation of any rejected results consistent with the U.S. EPA and Ohio EPA guidelines for data review;
 - (vi) analytical technique(s) or method(s) used; and
 - (vii) results of such analyses.

A.13 Signatory Requirement and Certification of Records
OAC Rules 3745-50-58(K) and 3745-50-42

All applications, reports or information must be properly signed and certified in accordance with OAC Rule 3745-50-58(K).

A.14 Retention of Records and Information Repository
OAC Rules 3745-50-40(G), 3745-50-58(J), 3745-50-58(M) and 3745-50-58(N)

- (a) The Permittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports and records required by this permit, the certification required by OAC Rule 3745-54-73(B)(9), and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report, certification, or application.
- (b) The record retention period may be extended by request of the Director at any time and is automatically extended during the course of any unresolved enforcement action regarding the facility.

- (c) The Permittee must maintain, in accordance with the Ohio hazardous waste rules, records of all data used to complete the permit application and any amendments, supplements or modifications of such application. The Permittee must retain a complete copy of the current application for the effective life of the permit as indicated in Permit Condition A.3.
- (d) The Permittee must maintain records from all ground water monitoring wells and associated ground water surface elevations for the active life of the facility, and for disposal facilities for the post-closure care period as well.
- (e) The Permittee must establish and maintain an information repository, at a location approved by the Director, based on the factors set forth in OAC rule 3745-50-39(C)(2). The information repository will be governed by the provisions in OAC Rules 3745-50-39(C)(3) through (C)(6).
- (f) Corrective Action records must be maintained at least three (3) years after all Corrective Action activities have been completed.

A.15 Planned Changes

OAC Rules 3745-50-51 and 3745-50-58(L)(1)

The Permittee must give notice to the Director as soon as possible of any planned physical alterations or additions to the facility. All such changes must be made in accordance with OAC Rule 3745-50-51.

A.16 Waste Shipments

OAC Rules 3745-52-12 and 3745-53-11, ORC Section 3734.15(C)

The Permittee must only use properly registered transporters of hazardous waste to remove hazardous waste from the facility, in accordance with all applicable laws and rules.

A.17 Anticipated Noncompliance

OAC Rule 3745-50-58(L)(2)

The Permittee must give advance notice to the Director of any planned changes in the permitted facility or operations which may result in noncompliance with the terms and conditions of this permit. Such notification does not waive the Permittee's duty to comply with this permit pursuant to Permit Condition A.5.

A.18 Transfer of Permits

OAC Rules 3745-50-52, 3745-50-58(L)(3) and 3745-54-12

- (a) This permit may be transferred to a new owner or operator only if such

transfer is conducted in accordance with ORC Chapter 3734 and the rules adopted thereunder. This permit may be transferred by the Permittee to a new owner or operator only if the permit has been modified under OAC Rule 3745-50-51. Before transferring ownership or operation of the facility, the Permittee must notify the new owner or operator in writing of the requirements of ORC Chapter 3734 and the rules adopted thereunder (including all applicable Corrective Action requirements).

- (b) The Permittee's failure to notify the new owner or operator of the requirements of the applicable Ohio law or hazardous waste rules does not relieve the new owner or operator of its obligation to comply with all applicable requirements.

A.19 Compliance Reports
OAC Rules 3745-50-58(L)(5) and 3745-50-50

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule (developed in accordance with OAC Rule 3745-50-50) of this permit must be submitted to the Director no later than fourteen (14) days following each scheduled date.

A.20 Immediate Reporting of Noncompliance
OAC Rule 3745-50-58(L)(6)

- (a) The Permittee must report orally to Ohio EPA's Division of Environmental Response and Revitalization within twenty-four (24) hours from the time the Permittee becomes aware of any noncompliance with this permit, ORC Chapter 3734 or the rules adopted thereunder, which may endanger human health or the environment, including:
 - (i) information concerning the release of any hazardous waste that may cause an endangerment to public drinking water supplies; and
 - (ii) any information of a release or discharge of hazardous waste, or a fire or explosion from the hazardous waste facility, which could threaten the environment or human health outside the facility.
- (b) The report must consist of the following information (if such information is available at the time of the oral report):
 - (i) name, address, and telephone number of the owner or operator;
 - (ii) name, address, and telephone number of the facility;
 - (iii) date, time, and type of incident;

- (iv) name and quantity of material(s) involved;
- (v) the extent of injuries, if any;
- (vi) an assessment of actual or potential hazards to the environment and human health outside the facility, where this is applicable; and
- (vii) estimated quantity and disposition of recovered material that resulted from the incident.

A.21 Follow-Up Written Report of Noncompliance
OAC Rule 3745-50-58(L)(6)(c)

- (a) A written report must also be provided to Ohio EPA's Division of Environmental Response and Revitalization and Division of Materials and Waste Management, Southeast District Office within five (5) days of the time the Permittee becomes aware of the circumstances reported in Permit Condition A.20.
- (b) The written report must address the items in Permit Condition A.20 and must contain a description of such noncompliance and its cause; the period(s) of noncompliance (including exact dates and times); whether the noncompliance has been corrected; and, if not, the anticipated time it is expected to continue; and steps taken or planned to minimize the impact on human health and the environment and to reduce, eliminate, and prevent recurrence of the noncompliance.
- (c) The Permittee need not comply with the five (5) day written report requirement if the Director, upon good cause shown by the Permittee, waives that requirement and the Permittee submits a written report within fifteen (15) days of the time the Permittee becomes aware of the circumstances.

A.22 Other Noncompliance
OAC Rules 3745-50-58(L)(10) and 3745-50-58(L)(4)

The Permittee must report to the Director all other instances of noncompliance not provided for in Permit Conditions A.19 and A.20. These reports must be submitted within thirty (30) days of the time at which the Permittee is aware of such noncompliance. Such reports must contain all information set forth within Permit Condition A.20.

A.23 Reserved

A.24 Other Information
OAC Rule 3745-50-58(L)(11)

If at any time the Permittee becomes aware that it failed to submit any relevant facts, or submitted incorrect information to the Director, the Permittee must promptly submit such facts, information or corrected information to the Director.

A.25 Confidential Information
OAC Rules 3745-49-03 and 3745-50-30

In accordance with ORC Chapter 3734 and the rules adopted thereunder, the Permittee may request confidentiality for any information required to be submitted by the terms and conditions of this permit, or any information obtained by the Director, or an authorized representative, pursuant to the authority provided under Permit Condition A.11.

A.26 Ohio Annual Permit, Disposal, and Treatment Fees
OAC Rules 3745-50-33 through 3745-50-36

The annual permit fee, calculated pursuant to OAC Rule 3745-50-36 and payable to the Treasurer of the State, must be submitted to the Director on or before the anniversary of the date of issuance during the term of the permit. For the purpose of the payment of the Ohio Annual Permit Fee, the date of issuance is the date the permit was entered into the Journal of the Director of Ohio EPA.

A.27 Compliance Schedule - Documents
OAC Rules 3745-50-50 and 3745-50-51

(a) Unless specified otherwise, the Permittee must submit the documents to:

Ohio EPA, Director
c/o DMWM, Engineering, Remediation, and Authorizations Section
P.O. Box 1049
Columbus, Ohio 43216-1049

Southeast District Office
Division of Materials and Waste Management
Attn: Environmental Supervisor
2195 Front Street
Logan, Ohio 43138

(b) The Permittee must submit to the Ohio EPA within sixty (60) days after permit journalization, in accordance with Ohio's hazardous waste rules, the following information to be incorporated in the permit application:

(i) Updated Post-Closure Cost Estimate
OAC Rule 3745-55-44

Section I, Appendix I-2 of the permit application containing the financial assurance mechanism for post-closure must be updated to include a copy of the current post-closure cost estimate as set forth in OAC Rule 3745-55-44.

(ii) Updated Corrective Action Cost Estimate
OAC Rule 3745-54-101

Section I of the permit application containing the financial assurance mechanism for corrective action must be updated to include a copy of the current corrective action cost estimate as set forth in OAC Rule 3745-54-101.

(iii) Updated Financial Assurance Mechanism for Post-Closure
OAC Rule 3745-55-45

Section I of the permit application containing the financial assurance mechanism for post-closure care and corrective action must be updated to include a copy of the current financial assurance mechanism, as set forth in OAC Rules 3745-55-45 and 3745-54-101 and as specified by the wording requirements of OAC Rule 3745-55-51. The value of the financial assurance mechanism must reflect at least the current amount of the post-closure and corrective action cost estimate.

During the life of the permit the facility may change the financial assurance mechanism as stated in OAC Rule 3745-55-45. The facility must submit the financial assurance mechanism documentation to the Director of Ohio EPA in accordance with the parameters set forth in OAC Rule 3745-55-45.

This information must be submitted in accordance with OAC Rule 3745-50-51.

A.28 Information to be Maintained at an Off-site Secure Location by the Permittee
OAC Rule 3745-54-74

(a) Unless otherwise specified by the hazardous waste rules, the Permittee must maintain at an off-site secure location, until released by the Director from financial assurance requirements pursuant to OAC Rule 3745-55-43, the following documents (including amendments, revisions and modifications):

(i) contingency plan, developed and maintained in accordance with OAC Rule 3745-54-53 and the terms and conditions of this permit;

- (ii) personnel training plan and the training records, developed and maintained in accordance with OAC Rule 3745-54-16 and the terms and conditions of this permit;
 - (iii) operating record, required by OAC Rule 3745-54-73 and the terms and conditions of this permit; and
 - (iv) inspection schedules, developed in accordance with OAC Rules 3745-54-15, 3745-55-74 and 3745-55-95 and the terms and conditions of this permit.
 - (v) post-closure plan, as required by OAC Rule 3745-55-18(A) and the terms and conditions of this permit.
 - (vi) annually-adjusted cost estimate for facility post-closure, as required by OAC Rule 3745-55-44 and the terms and conditions of this permit.
 - (vii) all other documents required by Module A, Permit Condition A.12
- (b) The Permittee must maintain copies of all inspection logs at the facility for a period not less than three (3) years from the date of inspection.

A.29 Reserved

MODULE B - GENERAL FACILITY CONDITIONS

B. GENERAL FACILITY CONDITIONS

B.1 Design and Operation of Facility OAC Rule 3745-54-31

- (a) The Permittee must design, construct, maintain and operate the facility to minimize the possibility of a fire, explosion, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, ground water or surface waters which could threaten human health or the environment.

B.2 Required Notices OAC Rule 3745-54-12

- (a) The permittee shall not receive hazardous waste from an off-site source.
- (b) The permittee shall not receive hazardous waste from a foreign source.

B.3 Reserved

B.4 Security OAC Rule 3745-54-14

The Permittee must comply with the security provisions of OAC Rule 3745-54-14(B)(1) or (2) and (C), and Section F of the permit application.

B.5 General Inspection Requirements OAC Rules 3745-54-15 and 3745-54-73

The Permittee must inspect the facility in accordance with OAC Rule 3745-54-15 and the inspection schedule set forth in Section F of the permit application. The Permittee must remedy any deterioration or malfunction discovered by an inspection, as required by OAC Rule 3745-54-15(C). Records of inspection must be kept for a minimum of three years from the date of inspection. These records must be a part of the facility's operating record as required by OAC Rule 3745-54-73.

B.6 Personnel Training OAC Rule 3745-54-16

The Permittee must conduct personnel training, as required by OAC Rule 3745-54-16. This training program must contain at least the elements set forth in Section G

of the permit application. The Permittee must maintain training documents and records as required by OAC Rule 3745-54-16(D) and (E).

B.7 Reserved

B.8 Reserved

B.9 Required Equipment
OAC Rule 3745-54-32

At a minimum, the Permittee must maintain at the facility all the equipment required by OAC Rule 3745-54-32 and the equipment set forth in the contingency plan contained in Section F of the permit application.

B.10 Testing and Maintenance of Equipment
OAC Rule 3745-54-33

The Permittee must inspect, test and maintain the equipment required by Permit Condition B.9 as necessary to assure its proper operation in time of emergency, as specified in OAC Rule 3745-54-33, Section F of the permit application and the terms and conditions of this permit.

B.11 Access to Communications or Alarm System
OAC Rule 3745-54-34

The Permittee must maintain access to the communications and alarm systems, as required by OAC Rule 3745-54-34, Section F of the permit application and the terms and conditions of this permit.

B.12 Required Aisle Space
OAC Rule 3745-54-35

At a minimum, the Permittee must maintain aisle space to allow the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment to any area of facility operation in an emergency, as required by OAC Rule 3745-54-35.

B.13 Arrangements with Local Authorities

OAC Rule 3745-54-37

- (a) The Permittee must comply with the requirements of OAC Rule 3745-54-37(A) by making a diligent effort to:
 - (i) make arrangements and familiarize all emergency response agencies which are likely to respond in an emergency with the location and layout of the facility, properties of hazardous waste managed at the facility and associated hazards, places where facility personnel will normally be working, entrances to and roads inside the facility, and possible evacuation routes as depicted and explained in Section G of the permit application;
 - (ii) make arrangements with Ohio EPA emergency response teams, emergency response contractors, and equipment suppliers;
 - (iii) make arrangements to familiarize local hospitals with the properties of hazardous waste handled at the facility and types of injuries or illnesses which could result from fires, explosions, or releases at the facility; and
 - (iv) make agreements designating primary emergency authority to a specific police and a specific fire department and make agreements with any others to provide support to the primary emergency authority, where more than one police and fire department may respond to an emergency.
- (b) Where authorities decline to enter into such agreements or arrangements set forth in OAC Rule 3745-54-37(A), the Permittee must document the refusal in the operating record as required by OAC Rule 3745-54-37(B).

B.14 Implementation of Contingency Plan

OAC Rules 3745-54-51 and 3745-54-56

The Permittee must immediately carry out the provisions of the contingency plan and follow the emergency procedures described in OAC Rule 3745-54-56 whenever there is a fire, explosion, or release of hazardous waste or hazardous waste constituents which threatens or could threaten human health or the environment.

In regard to spills and related toxic gas releases, the plan must describe the criteria to be used by the emergency coordinator to determine when the plan will be implemented. At a minimum, the plan must be implemented in the following situations:

- (a) Any fire involving hazardous waste; or
- (b) Any explosion involving hazardous waste; or
- (c) Any uncontrolled hazardous waste reaction that produces or has the potential to produce hazardous conditions, including noxious, poisonous, flammable and/or explosive gases, fumes, or vapors; harmful dust; or explosive conditions; or
- (d) Any hazardous waste release, outside of a secondary containment system, that causes or has the potential to cause off-site soil and/or surface water contamination; or
- (e) Any hazardous waste release that produces or has the potential to produce hazardous conditions, including noxious, poisonous, flammable and/or explosive gases, fumes, or vapors; harmful dust; or explosive conditions.

B.15 Content of the Contingency Plan
OAC Rule 3745-54-52

The Permittee must comply with OAC Rule 3745-54-52 and the contingency plan, as set forth in Section G of the permit application.

B.16 Contingency Plan - Released Material and Emergency Response Material and By-products
OAC Rule 3745-54-56(G)

- (a) Immediately after an emergency, the emergency coordinator must provide for treating, storing, or disposing of recovered waste, contaminated soil or surface water, or any other material that results from a release, fire, or explosion at the facility.
- (b) All liquid or solid material resulting from fire, explosion, released material or emergency response material and by-products that the Permittee is required to evaluate to determine whether such material is hazardous waste in

accordance with OAC Rule 3745-52-11 must be collected and managed as a hazardous waste unless the Permittee can demonstrate that such waste is not hazardous in accordance with OAC Rule 3745-51-03(C) and (D).

B.17 Amendments to Plan
OAC Rule 3745-54-54

The Permittee must review the contingency plan at least annually and upon the occurrence of any event listed in OAC Rule 3745-54-54. If necessary or appropriate, the Permittee must amend the contingency plan as required by OAC Rule 3745-54-54 in accordance with OAC Rule 3745-50-51.

B.18 Copies of Plan
OAC Rule 3745-54-53

- (a) The Permittee must comply with the requirements set forth in OAC Rule 3745-54-53 regarding contingency plan distribution. The Permittee must maintain at the facility a copy of the contingency plan and all revisions to the plan.
- (b) The Permittee must, in accordance with OAC Rule 3745-54-53, submit a copy of the contingency plan to all local police departments, fire departments, hospitals and local emergency response teams that may be called upon to provide emergency services. The Permittee must notify such agencies and the local authorities, in writing, within ten (10) days of the effective date of any amendments of, revisions to, or modifications to the contingency plan.
- (c) The Permittee must, in accordance with OAC Rule 3745-54-53, submit a copy of the contingency plan to the Ohio Environmental Protection Agency's Division of Environmental Response and Revitalization.

B.19 Emergency Coordinator
OAC Rule 3745-54-55

The Permittee must comply with the requirements set forth in OAC Rule 3745-54-55 regarding the emergency coordinator.

B.20 Emergency Procedures
OAC Rule 3745-54-56

The Permittee must comply with the requirements regarding emergency procedures set forth in OAC Rule 3745-54-56, Section G of the permit application and the terms and conditions of this permit.

B.21 Availability, Retention and Disposition of Records
OAC Rule 3745-54-74

All records shall be furnished by the Permittee upon request to, and made available at all reasonable times for inspection by, Ohio EPA, in accordance with OAC Rule 3745-54-74.

B.22 Operating Record
OAC Rule 3745-54-73

The Permittee must comply with the requirements set forth in OAC Rule 3745-54-73 regarding an operating record, including information to be recorded and the maintenance thereof.

B.23 Contingency Plan Records
OAC Rule 3745-54-56(J)

The Permittee must note in the operating record the time, date, and details of any incident that requires the implementation of the contingency plan. Within fifteen (15) days after any such incident the Permittee must submit to the Director a written report of the incident containing the elements set forth in OAC Rule 3745-54-56(J).

B.24 Manifest System

OAC Rules 3745-54-70, 3745-54-71, 3745-54-72 and 3745-54-76

- (a) In managing waste at the facility, the Permittee must comply with OAC Chapter 3745-52 and OAC Rules 3745-54-71, 3745-54-72 and 3745-54-76 with regard to the manifest system.

B.25 Biennial Report and Additional Reports

OAC Rules 3745-54-75 and 3745-54-77

The Permittee must comply with the report requirements set forth in OAC Rule 3745-54-75 and the additional report requirements set forth in OAC Rule 3745-54-77.

B.26 Reserved

B.27 Reserved

B.28 Reserved

B.29 Reserved

B.30 Reserved

B.31 Reserved

B.32 Reserved

B.33 Reserved

B.34 Reserved

B.35 General Post-Closure Requirements

OAC Rules 3745-55-17, 3745-55-18, 3745-55-19 and 3745-55-20

(a) Post-Closure Care Period

The Permittee must continue post-closure care for Pond 1 and Pond 2 for thirty years after the date of completion of closure of the units. Post-closure care must be in accordance with OAC Rule 3745-55-17 and the post-closure

plan. The permittee must also comply with the contingent closure provisions in OAC Rule 3745-56-28.

(b) Amendment to Post-Closure Plan

The Permittee must amend the post-closure plan, when necessary, in accordance with OAC Rule 3745-55-18(D).

(c) Reserved

(d) Certification of Post-Closure Care

No later than sixty days after completion of the established post-closure care period for each hazardous waste disposal unit, the Permittee must certify that the post-closure care period was performed in accordance with the specifications in the post-closure plan and the terms and conditions of this permit, as required by OAC Rule 3745-55-20. The Permittee must furnish to the Director, upon request, documentation supporting the certification.

B.36 Cost Estimate for Facility Post-Closure
OAC Rule 3745-55-44

- (a) The Permittee's most recent post-closure cost estimate, prepared in accordance with OAC Rule 3745-55-44, is specified in Section I of the permit application.
- (b) The Permittee must adjust the post-closure cost estimate for inflation within 30 days after the close of the Permittee's fiscal year and before submission of updated information to the Director, as specified in OAC Rule 3745-55-44(B).
- (c) The Permittee must revise the post-closure cost estimate whenever there is a change in the facility's post-closure plan that increases the cost of post-closure care, as required by OAC Rule 3745-55-44(C).
- (d) The Permittee must submit to Ohio EPA and keep at the facility the latest post-closure cost estimate as required by OAC Rule 3745-55-44(D) and (E).

B.37 Financial Assurance for Facility Post-Closure

The Permittee must maintain continuous compliance with OAC Rule 3745-55-45 and 3745-55-46 and provide documentation of financial assurance, which meets the requirements of OAC Rule 3745-55-51, in at least the amount of the cost estimates required by Permit Condition B.36.

B.38 Reserved

B.39 Incapacity of Owners or Operators, Guarantors, or Financial Institutions
OAC Rule 3745-55-48

The Permittee must comply with requirements set forth in OAC Rule 3745-55-48 regarding the incapacity of owners, operators, guarantors or financial institutions.

B.40 General Requirements for Land Disposal Restrictions
OAC Chapter 3745-270

The Permittee must comply with all applicable regulations regarding land disposal prohibitions and restrictions as required by OAC Chapter 3745-270.

MODULE C – RESERVED

MODULE D - RESERVED

MODULE E - CORRECTIVE ACTION REQUIREMENTS

Prior to 1999, U.S. EPA Region 5 had the lead role in overseeing the corrective action activities at the Cytec Marietta facility. When Ohio EPA issued Cytec a renewal Part B permit on February 22, 1999, Ohio EPA took over the lead role for corrective action oversight from U.S. EPA. Since that time, Cytec has been conducting various corrective action sampling, investigation, and cleanup efforts in accordance with approved RCRA Facility Investigation (RFI) workplans and submittals to Ohio EPA.

Cytec submitted a draft RFI Report to Ohio EPA in October 1999 and an RFI Report Addendum in September 2004. The RFI Report Addendum was approved in May 2005. In addition to performing these RFI activities, since 1999 Cytec has performed Interim Measures on SWMUs 3, 11, and 12, has undertaken an expanded investigation of Duck Creek, and has performed a site-wide ecological risk assessment. Cytec also submitted a Corrective Measures Study (CMS) workplan to Ohio EPA in October 2004 and a Corrective Measures Implementation (CMI) Plan in June 2006. Cytec submitted the CMS Report in May 2007. Ohio EPA modified Cytec's permit in April 2011 to incorporate the selected remedies for the SWMUs that were identified in the CMI Plan (except for SWMU 1). Cytec submitted a CMS Supplemental workplan for SWMU 1 in June 2011 and a revised CMS Report in November 2011. The revised CMS Report was approved in June 2012. Ohio EPA modified Cytec's permit in September 2012 to incorporate selected remedies for SWMUs 1, 26, OSC A, Duck Creek, and the drainage swale. After Corrective Measures for SWMU 1 have been implemented, Cytec will submit a Corrective Measures Design for ground water that will include site-wide hydraulic control.

E.1 Corrective Action at the Facility OAC Rules 3745-50-10 & 3745-54-101

In accordance with OAC Rule 3745-50-10, waste management unit means any discernible unit at which solid waste, hazardous waste, infectious waste (as those terms are defined in ORC Chapter 3734), construction and demolition debris (as defined in ORC Chapter 3714), industrial waste, or other waste (as those terms are defined in ORC Chapter 6111) has been placed at any time, irrespective of whether the unit was intended for the management of solid waste or hazardous waste. Such units include any area at a facility at which wastes have been routinely and systematically released. For the purpose of Corrective Action, facility is defined as all contiguous property under the control of the owner or operator seeking a permit under Subtitle C of RCRA. The terms Interim Measure (IM), RCRA Facility Investigation (RFI), Corrective Measures Study (CMS) and Corrective Measure Implementation (CMI) are defined in U.S. EPA's Corrective Action Plan (CAP) (OSWER Directive 9902.3-2A, May 1994).

The Permittee must institute Corrective Action as necessary to protect human health and the environment for all releases of hazardous wastes or hazardous constituents from any waste management units (WMUs) at the Facility, regardless of the time at which waste was placed in such units.

E.2 Corrective Action Beyond the Facility Boundary
OAC Rule 3745-54-101

The Permittee must implement Corrective Action beyond the Facility property boundary, where necessary, to protect human health and the environment, unless the Permittee demonstrates to the satisfaction of Ohio EPA, that, despite the Permittee's best efforts, the Permittee was unable to obtain the necessary permission to undertake such actions. The Permittee is not relieved of all responsibility to clean up a release that has migrated beyond the Facility boundary where off-site access is denied. On-site measures to address such releases will be addressed under the RFI, CMS, and CMI phases, as determined to be necessary on a case-by-case basis.

E.3 Identification of WMUs
OAC Rules 3745-50-44(D) and 3745-54-101

A RCRA Facility Assessment (RFA) was conducted by U.S. EPA, and consisted of a preliminary review (PR) and visual site inspection (VSI). The RFA/PR was performed in May 1986 and the RFA/VSI was performed in November, 1990. Twenty-six (26) WMUs were identified in this process. These units consist of three (3) landfills, three (3) ponds, eleven (11) storage areas, three (3) disposal areas, and six (6) process areas. Subsequent to the initial report, additional waste management units were identified, bringing the total to thirty-three (33) WMUs. These units are listed and described in Section J and Table J-1 of the Part B permit application. An RFI Report has been submitted for all of the identified units at the facility. The most recent Supplemental RFI Report was approved in May 2005.

E.4 Reserved

E.5 RCRA Facility Investigation (RFI)
OAC Rule 3745-54-101

The Permittee must conduct an RFI to thoroughly evaluate the nature and extent of the release of hazardous wastes and hazardous constituents from all applicable WMUs identified in Permit Condition E.3 above and Permit Condition E.10. The major tasks and required submittal dates are shown below. The scope of work for each of the tasks is found in U.S. EPA's CAP.

(a) RFI Workplan

The Permittee must submit a written RFI Workplan to Ohio EPA within ninety (90) days after the discovery of a new waste management unit, or upon a time frame established by Ohio EPA.

- (i) Within forty-five (45) days of receipt of any Ohio EPA comments on the RFI Workplan, the Permittee must submit either an amended or new RFI Workplan that incorporates Ohio EPA's comments.
- (ii) Ohio EPA will approve or modify and approve, in writing, the amended or new RFI Workplan. The RFI Workplan, as approved or as modified and approved, shall be incorporated into this permit and become an enforceable condition of this permit. Subsequent changes to the approved RFI Workplan must be authorized by Ohio EPA.

(b) RFI Implementation

The Permittee must implement the RFI Workplan according to the terms and schedule in the approved RFI Workplan.

(c) RFI Final Report

Within ninety (90) days after the completion of the RFI, the Permittee must submit an RFI Final Report to Ohio EPA. The RFI Final Report must describe the procedures, methods, and results of the RFI. The Final Report must contain adequate information to support further decisions concerning Corrective Action at the Facility.

- (i) Within forty-five (45) days of receipt of any Ohio EPA comments on the RFI Final Report, the Permittee must submit either an amended or new RFI Final Report that incorporates Ohio EPA's comments.
- (ii) Ohio EPA will approve or modify and approve, in writing, the amended or new RFI Final Report. The RFI Final Report, as approved or as modified and approved, shall be incorporated into this permit and become an enforceable condition of this permit. Subsequent changes to the approved RFI Final Report must be authorized by Ohio EPA.

E.6 Interim Measure (IM)

Based on the RFI Final Report or other information documenting a release of hazardous waste or constituents to the environment, Ohio EPA may require (or the Permittee may propose) the development and implementation of an IM (this may include an IM Workplan) at any time during the life of the permit to mitigate or eliminate a threat to human health or the environment. The Permittee must implement the IM upon a time frame established by Ohio EPA.

E.7 Determination of No Further Action

(a) Permit Modification

Based on the results of the completed RFI and other relevant information, the Permittee may submit an application to Ohio EPA for a permit modification under OAC Rule 3745-50-51 to terminate the Corrective Action tasks of the Schedule of Compliance. Other tasks identified in the Schedule of Compliance shall remain in effect. This permit modification application must conclusively demonstrate that there are no releases of hazardous waste or constituents from WMUs at the Facility that pose an unacceptable risk to human health and the environment.

If, based upon review of the Permittee's request for a permit modification, the results of the completed RFI, and other information, Ohio EPA determines that releases or suspected releases which were investigated are either nonexistent or do not pose an unacceptable risk to human health and the environment, Ohio EPA will approve the requested modification. Decisions regarding the completion of RCRA Corrective Action and no further action may be made for the entire Facility, for a portion of the Facility, or for a specific unit or release.

(b) Periodic Monitoring

A determination of no further action shall not preclude Ohio EPA from requiring continued or periodic monitoring of air, soil, ground water, or surface water, if necessary to protect human health and the environment, when site-specific circumstances indicate that a potential or an actual release of hazardous waste or constituents exists.

(c) Further Investigations

A determination of no further action shall not preclude Ohio EPA from requiring further investigations, studies, or remediation at a later date, if new information or subsequent analysis indicates that a release or potential release from a WMU at the Facility may pose an unacceptable risk to human health or the environment. In such a case, Ohio EPA shall initiate a modification to the terms of the permit to rescind the determination made in accordance with Permit Condition E.7(a). Additionally, in the event Ohio EPA determines that there is insufficient information on which to base a determination, the Permittee, upon notification, is required to develop a Work Plan and upon Ohio EPA approval of that Work Plan, perform additional investigations as needed.

E.8 Corrective Measures Study (CMS)

If Ohio EPA determines, based on the results of the RFI and any other relevant information, that corrective measures are necessary, Ohio EPA will notify the Permittee in writing that the Permittee must conduct a CMS either as described below or as described in Ohio EPA's notification to the Permittee. The purpose of

the CMS will be to develop and evaluate the corrective action alternative(s) and to outline one or more alternative corrective measure(s) that will satisfy the performance objectives specified in Permit Condition E.9.

(a) CMS Workplan

The Permittee must submit a written CMS Workplan to Ohio EPA within 90 days from the notification by Ohio EPA of the requirement to conduct a CMS.

- (i) Within 45 days of receipt of any Ohio EPA comments, the Permittee must submit either an amended or new CMS Workplan that incorporates Ohio EPA's comments.
- (ii) Ohio EPA will approve or modify and approve, in writing, the amended or new CMS Workplan. The CMS Workplan, as approved or as modified and approved, must be incorporated into this permit and become an enforceable condition of this permit. Subsequent changes to the approved CMS Workplan must be authorized by Ohio EPA.

(b) CMS Workplan Implementation

The Permittee must implement the CMS Workplan according to the terms and schedule in the approved CMS Workplan.

(c) CMS Final Report

Within 60 days after the completion of the CMS, the Permittee must submit a CMS Final Report to Ohio EPA. The CMS Final Report must summarize the results of the investigations for each remedy studied and must include an evaluation of each remedial alternative.

- (i) Within 45 days of receipt of any Ohio EPA comments, the Permittee must submit either an amended or new CMS Final Report that incorporates Ohio EPA's comments.
- (ii) Ohio EPA will approve or modify and approve, in writing, the amended or new CMS Final Report. The CMS Final Report, as approved or as modified and approved, must be incorporated into this permit and become an enforceable condition of this permit. Subsequent changes to the approved CMS Final Report must be authorized by Ohio EPA. The CMS Final Report shall include a remediation schedule for each WMU at the site, unless Permit Condition E.7 applies.

E.9 Corrective Measures Implementation (CMI)

Based on the results of the CMS, the Permittee must implement one or more of the Corrective Measures authorized by Ohio EPA. Ohio EPA will authorize one or more

of the Corrective Measures in the CMS, and will notify the Permittee in writing of the decision. The Corrective Measure selected for implementation must: (1) be protective of human health and the environment; (2) attain media cleanup standards; (3) control the source(s) of releases so as to reduce or eliminate further releases of hazardous waste(s) (including hazardous constituents); and (4) comply with all applicable standards for management of wastes.

If two or more of the Corrective Measures studied meet the threshold criteria set out above, Ohio EPA will authorize the Corrective Measures Implementation by considering remedy selection factors including: (1) long-term reliability and effectiveness; (2) the degree to which the Corrective Measure will reduce the toxicity, mobility or volume of contamination; (3) the Corrective Measure's short-term effectiveness; (4) the Corrective Measure's implementability; and (5) the relative cost associated with the alternative.

- (a) Reserved
- (b) Selected Corrective Measures (Remedies)

Based on the final RFI and CMS Reports, and the remedial measures that have previously been conducted at the site, Ohio EPA previously proposed and approved the following corrective measures for on-site WMUs and other areas of concern:

- (i) WMU 1 (North Landfill):

Ohio EPA has selected a remedy that includes:

- (1) A slurry wall extending along the west and south sides of the landfill. The slurry wall will be designed to be keyed into bedrock to prevent lateral migration of ground water into the landfill;
- (2) Cap augmentation consisting of a synthetic liner and recompacted clay in areas of the landfill where the current cap is less than 3 feet thick;
- (3) A recompacted clay berm placed along the northeast corner of the landfill to prevent infiltration of waters from a 100-year flood event;
- (4) Hydraulic control downgradient of the landfill (hydraulic control is part of the ground water remedy in E.9(b)(xv) of this document); and
- (5) A component of this remedy shall also include an environmental covenant to identify this area as having waste

remaining in place, require that no disturbance of the cap or its components be allowed without consent by Ohio EPA and restrict ground water use.

(ii) WMU 2 (North Storage Yard):

The remedy for WMU 2 is an institutional control in the form of an environmental covenant, since the results of the Human Health Risk Assessment (HHRA) indicate that this measure is appropriate and adequate to provide protection of human health and the environment.

(iii) WMU 3 (South Landfill):

The remedy for WMU 3 is an institutional control in the form of an environmental covenant. WMU 3 was excavated in 2001-2002, for off-site disposal. A component of this remedy is the requirement to establish a permanent wetland in the area, where the current pond is located near Hunter Avenue.

(iv) WMU 8 (Pond 1):

Corrective measures were implemented at Pond 1 through Ohio EPA's closure program by removal of contaminated sludge, backfilling with clean soil, and capping technologies. A component of this remedy that remains to be implemented is an environmental covenant to identify this area as having waste remaining in place, require that no disturbance of the cap or its components be allowed without consent by Ohio EPA, restrict ground water use, and indicate that monitoring (e.g. cap condition, ground water monitoring) will occur to confirm the adequacy of the remedy.

(v) WMU 10 (Building 60 Outside North):

The selected remedy for WMU 10 is a Type 2 cap (Ohio EPA's "Closure Plan Review Guidance 2008", Appendix G). A Type 2 cap shall consist of a synthetic liner, a drainage layer, a protective geotextile layer, and a two feet thick clean soil layer placed on top. It will eliminate direct contact with contaminated soils, and minimize surface water infiltration. (An alternative cap which meets this design criteria and performance may also be approved.) The area that the cap covers will also include the Building 60/62 complex where COCs in soils exceed screening values. A component of this remedy shall include an environmental covenant to identify this area as having waste remaining in place, require that no disturbance of the cap or its components be allowed without consent by Ohio EPA, restrict ground water use, and indicate that monitoring (e.g., cap condition, ground water monitoring) will occur to confirm the adequacy of the remedy.

(vi) WMU 11 (Eastern Disposal Area):

Since WMU 11 was excavated in 2002 for off-site disposal, the selected remedy is an institutional control in the form of an environmental covenant. In addition to this remedy, a permanent wetland shall be established in the area where the current pond is located near Hunter Avenue.

(vii) WMU 14 (West Disposal Area):

No further action is necessary since WMU 14 was removed during the 1996 RM (Remedial Measure) and the area is incorporated into the Pond 1 remedy. Arsenic concentrations were demonstrated to be representative of background conditions.

(viii) WMU 19 (Cooling Pond North):

The selected remedy for WMU 19 is an institutional control in the form of an environmental covenant. The results of the HHRA indicate that the institutional control is appropriate and adequate to provide protection of human health and the environment.

(ix) WMU 20 (North Equipment Storage Area):

The selected remedy for WMU 20 is an institutional control in the form of an environmental covenant. The results of the HHRA indicate that the institutional control is appropriate and adequate to provide protection of human health and the environment.

(x) WMU 25 (Pond 1 Extension):

No further action is necessary since arsenic concentrations at WMU 25 were demonstrated to be representative of background conditions.

(xi) WMU 26 (East Storage Pad):

The selected remedy for WMU 26 is excavation and offsite disposal of contaminated soils. Contaminated soils have been identified in the WMU 26 area that exhibit unacceptable risks to human health and the environment, and exceed impacts to ground water protection levels. The excavation should remove contaminated source materials to provide a long term effective remedy. This remedy, in addition to hydraulic control for ground water, will shorten the overall ground water cleanup timeframes.

(xii) WMU 28 (Piping from Pond 1 to Pond 2):

The selected remedy for WMU 28 is an institutional control in the form of an environmental covenant. The results of the HHRA indicate that the institutional control is appropriate and adequate to provide protection of human health and the environment.

(xiii) West Tank Farm:

The selected remedy for the west tank farm (WTF) is an institutional control in the form of an environmental covenant, plus hydraulic control for ground water. A multi-layer cap was placed over the former WTF when the unit was incorporated into the Pond 1 remedy, eliminating direct contact with COCs and minimizing surface water infiltration. The environmental covenant shall identify this area as having waste remaining in place, require that no disturbance of the cap or its components be allowed without consent by Ohio EPA, restrict ground water use, and indicate that monitoring (e.g., cap condition, ground water monitoring) will occur to confirm the adequacy of the remedy.

(xiv) OSC A (Concrete Tank Saddles):

The selected remedy for OSC A is to incorporate the SWMU 10 cap described in section E.9(b)(v) by extending the cap to cover the OSC A Concrete Tank Saddle area. One constituent (nitrobenzene) was identified in soil at an estimated concentration just above the applicable impact to ground water screening value.

(xv) Ground Water:

The selected remedy for ground water is hydraulic control. This remedy shall include pumping ground water from approximately six extraction wells to prevent further migration of COCs beyond the Point of Compliance (POC). The POC extends along the northern and eastern portions of the property, mainly along Hunter Avenue. Further details concerning the extraction wells, system components, pretreatment technology, and discharge location(s) shall be specified in the Corrective Measures Design document for the ground water remedy.

(xvi) Duck Creek:

The selected remedy for Duck Creek is to conduct biocriteria monitoring on a five year schedule for the next two sampling events. The next sampling events would be 2016 and 2021. Currently,

monitoring activities include sediment sampling, surface water sampling, fish tissue sampling, and biocriteria evaluations. Changes to the monitoring plan and/or corrective measures to Duck Creek may be necessary based on future sampling results. As a protective measure, a fish consumption advisory is currently in place for Duck Creek from Township Road 329 (Stanleyville) to SR 26 (Norwood) and from SR 26 (Norwood) to the mouth of the Ohio River for total DDT and mercury.

(xvii) Drainage Swale:

The selected remedy for the swale at sampling location SWL-01 is no further action based upon confirmation sampling that indicated non detect for constituents of concern.

- (c) Within ninety (90) days after the effective date of remedy selection, the Permittee shall submit to Ohio EPA for its review and comment a Corrective Measures Implementation (CMI) Work Plan, where applicable, for the above selected corrective measures (i) through (xvii). CMI Work Plans have been submitted for all of the selected corrective measures. The most recent CMI Work Plan was approved September 2011.

The CMI Work Plan shall be developed in conformance with the site-specific Scope of Work (SOW) provided in Appendix A, following this Permit Module E.

- (i) Ohio EPA will review the CMI Work Plan and provide comments to the Permittee. Within 30 days of receipt of Ohio EPA's comments on the CMI Work Plan, the Permittee shall submit a new or revised CMI Work Plan that incorporates Ohio EPA's comments.
- (ii) Ohio EPA shall approve or modify and approve, in writing, the amended or new CMI Work Plan. The CMI Work Plan, as approved or as modified and approved, shall be incorporated in and made an enforceable part of this Permit. The approved CMI Work Plan shall be implemented in accordance with the terms, conditions and schedules contained therein. Subsequent changes to the approved CMI Work Plan must be authorized by Ohio EPA.
- (iii) The Permittee shall submit the additional reports specified in Attachment A in accordance with the schedules contained therein.
- (iv) Should the Permittee identify any inconsistency between any of the laws and regulations which it is required to follow by this Permit, the Permittee shall promptly notify Ohio EPA in writing of each inconsistency and the effect of the inconsistencies upon the work to be performed. The Permittee shall also recommend, along with a

supportable rationale justifying each recommendation, the requirement the Permittee believes should be followed. The Permittee shall implement the affected work as directed by Ohio EPA.

(d) Additional Work

Ohio EPA may determine that in addition to the tasks defined in the CMI Work Plan, additional work may be necessary to accomplish the objectives of this Permit.

Within 30 days after receipt of written notice from Ohio EPA that additional work is necessary, the Permittee shall submit a Work Plan for the performance of the additional work. The Work Plan, as approved by Ohio EPA, shall be incorporated in and made an enforceable part of this Permit. Upon approval of the Work Plan by Ohio EPA, the Permittee shall implement the work plan in accordance with the schedules contained therein.

- (i) The Permittee shall provide a copy of this Permit to all contractors, subcontractors, laboratories, and consultants retained to perform any portion of the work pursuant to this Permit. The Permittee shall ensure that all contractors, subcontractors, laboratories and consultants retained to perform work pursuant to this Permit comply with the provisions of this Permit.
- (ii) For the duration of the Permit, the Permittee shall use reasonable best efforts to assure that no portion of the Site will be used in any manner which would adversely affect the integrity of any corrective measures, including monitoring systems, at the Site. The Permittee shall promptly notify Ohio EPA by registered mail of any conveyance of any interest in real property which is known to comprise the Site of which it has actual knowledge. The Permittee's notice shall include the name and address of the grantee and a description of the provisions made for continued maintenance of containment or monitoring systems. In no event shall the conveyance of any interest in the property that includes, or is a portion of, the Site, release or otherwise affect the liability of the Permittee to comply with this Permit. In the alternative, the Permittee, along with its prospective buyer, may provide such notice to Ohio EPA in advance of any conveyance of any interest in real property which is known to comprise the Site and request modification of this Permit pursuant to Permit Conditions A.2 and A.18, in order to transfer the Permittee obligations under this Permit to the prospective buyer.
- (iii) Consistent with the approved detailed schedule and plan to construct and implement the selected remedy, the Permittee must complete the CMI tasks identified in the Scope of Work (SOW), including, but not limited to, demonstrating that the appropriate soil and ground water

performance standards are met. The final remedy shall meet the ground water performance standards specified in Module Z of the permit. The Permittee shall develop appropriate soil cleanup standards as part of the CMI Work Plan for remedies involving soil excavation (WMU 26).

(e) Environmental Covenants

Many of the WMU's and Areas of Concern will be protected by an environmental covenant. Environmental Covenants, in accordance with Ohio's Environmental Covenant law, ORC Sections 5301.80 to 5301.92, will declare the site as industrial use only, controlling human exposure to COCs in soils and ground water. Restrictions shall include, but not be limited to, prohibition of extraction or use of ground water on-site, and prohibition of on-site excavation (excluding utility easements).

(f) Financial Assurance
OAC Rule 3745-54-101

Within 30 days after receiving approval of the CMI Work Plan, the Permittee must provide financial assurance in the amount necessary to implement the corrective measure(s) as required by OAC Rule 3745-54-101(B) and (C). Financial assurance has been provided for the most recently approved CMI Work Plan, approved September 2011.

E.10 Newly Identified WMUs or Releases
OAC Rule 3745-54-101

(a) General Information

The Permittee must submit to Ohio EPA, within 30 days of discovery, the following information regarding any new WMU identified at the Facility by Ohio EPA or the Permittee:

- (i) The location of the unit on the site topographic map;
- (ii) Designation of the type of unit;
- (iii) General dimensions and structural description (supply any available drawings);
- (iv) When the unit was operated; and
- (v) Specification of all waste(s) that have been managed at the unit.

(b) Release Information

The Permittee must submit to Ohio EPA, within 30 days of discovery, all available information pertaining to any release of hazardous waste(s) or hazardous constituent(s) from any new or existing WMU.

E.11 Corrective Action for Newly Identified WMUs and Releases
OAC Rule 3745-54-101

If Ohio EPA determines that an RFI is required for newly identified WMUs, the Permittee must submit a written RFI Workplan to Ohio EPA upon a time frame established in written notification by Ohio EPA in accordance with Permit Condition E.5. This determination will be made based on the information submitted in accordance with Permit Condition E.10. Further investigations or corrective measures will be established by Ohio EPA. The Permittee must make such submittal in accordance with time frames established by Ohio EPA.

E.12 Completion of Corrective Action
OAC Rule 3745-54-101

After completing Corrective Action as necessary to protect human health and the environment for all releases of hazardous wastes or hazardous constituents from any WMUs at the Facility, the Permittee shall submit a Corrective Measures Completion of Work (CMCW) Report. The CMCW Report shall document that Corrective Action construction is complete, cleanup objectives and standards have

been met, and any releases of hazardous waste or constituents no longer pose an unacceptable risk to human health and the environment. The CMCW Report may be submitted for any part of the Facility for which corrective measures are complete, or for the entire Facility. The CMCW Report must be submitted as a request for permit modification pursuant to OAC Rule 3745-50-51.

E.13 Documents Requiring Professional Engineer Stamp
ORC Section 4733.01

Preparation of the following Corrective Action documents constitutes the "practice of engineering" as defined by ORC Section 4733.01:

Final Interim Measures Report

Corrective Measures Final Design

Corrective Measures Construction Completion Report

Corrective Measures Attainment of Ground Water Performance Standards Report

Corrective Measures Completion of Work Report

As such, the Permittee must ensure that these documents, as submitted to Ohio EPA, are stamped by a Professional Engineer licensed to practice in the State of Ohio.

APPENDIX A

CMI SCOPE OF WORK

PURPOSE

This Scope of Work (SOW) sets forth the requirements for the implementation of the design, construction, operation, maintenance, and monitoring of the corrective measures provided in Cytec's Part B permit, Module E, Condition E.9. The Permittee will furnish all personnel, materials, and services necessary for the implementation of the corrective measures.

THE SCOPE OF WORK FOR IMPLEMENTATION OF CORRECTIVE MEASURES

The Corrective Measures Implementation consists of four tasks:

Task I: CMI Work Plan

- A. Project Management Plan
- B. Public Involvement Plan

Task II: Corrective Measures Design

- A. Design Plans and Specifications
- B. Operation and Maintenance Plan
- C. Health and Safety Plan
- D. Sampling and Analysis Plan/Performance Monitoring Plan
- E. Cost Estimate

Task III: Corrective Measures Construction and Construction Completion Report

Task IV: Reports and Submissions

- A. Quarterly Progress Reports of CMI
- B. Annual Progress Reports
- C. 5-Year Report
- D. Attainment of Ground Water Performance Standards Report
- E. Corrective Measures Completion of Work (CMCW) Report

Further specifications of the work outlined in this SOW will be provided in the CMI Work Plan and subsequent plans to be reviewed and approved by Ohio EPA. Variations from the SOW will be made, if necessary, to fulfill the objectives of the corrective measures. Additional studies may be necessary as part of the CMI to supplement the available data. At the direction of Ohio EPA for any such studies required, the Permittee shall furnish all

services, including field work, materials, supplies, labor, equipment, investigations, and superintendence. Sufficient sampling, testing and analysis shall be performed to optimize the operation of the required treatment, disposal, containment and/or monitoring systems.

TASK I: CORRECTIVE MEASURES IMPLEMENTATION WORK PLAN

The Permittee shall prepare a Corrective Measures Implementation (CMI) Work Plan. The CMI Work Plan shall outline the design, construction, operation, maintenance and monitoring of all actions taken to implement the corrective measures provided in Cytec's Part B Permit, Module E, Condition E.9. This CMI Work Plan will include the development and implementation of several plans, which require concurrent preparation. It may be necessary to revise plans as necessary during corrective measures implementation.

The CMI Work Plan shall include but not be limited to the following:

- A. Project Management Plan: The Permittee shall prepare a Project Management Plan which will address the following items, as necessary and appropriate:
1. Documentation of the overall management strategy for performing the design, construction, operation, maintenance, and monitoring of corrective measures;
 2. Description of the responsibility and authority of all organizations and key personnel involved with the implementation;
 3. Description of the required qualifications of key personnel directing the CMI, including contractor personnel;
 4. An outline of proposed field activities necessary to complete the CMI Design including proposed locations of ground water monitoring wells and air monitoring stations;
 5. Description of how the conceptual design is expected to meet the technical requirements of the Statement of Basis and any amendments thereto; and
 6. Schedule of work including sequence of activities to be performed during the CMI, and proposed timing for submittals required during the CMI.
- B. Public Involvement Plan: A Public Involvement Plan will be developed to describe the community relations program to be implemented by the Permittee during the design and construction. At the request of Ohio EPA, the Permittee may participate in the preparation of information disseminated to the public and in providing information for public meetings that may be held or sponsored by Ohio EPA.

TASK II: CORRECTIVE MEASURES DESIGN

The Permittee shall prepare a Final Design Report including specifications and a construction plan to implement the corrective measures at the facility as set forth in the Statement of Basis and any amendments thereto.

- A. Design Plans and Specifications: The Permittee shall develop clear and comprehensive design plans and specifications which include, but are not limited to the following:
1. Discussion of the design strategy and the design basis, including: (a) compliance with all applicable or relevant environmental and public health standards; (b) minimization of environmental and public health impacts, and; (c) updated schedules, if necessary, from commencement through completion of construction of the CMI.
 2. Discussion of the technical factors of importance including: (a) use of currently accepted environmental control measures and technology; (b) the constructability of the design, and; (c) use of currently accepted construction practices and techniques.
 3. Description of models and assumptions made and detailed justification of these assumptions.
 4. Detailed drawings of the proposed design.
 5. Tables listing equipment and specifications;
 6. Appendices including: (a) sample calculations (one example presented and explained clearly for significant or unique design calculations); (b) results of laboratory or field tests; (c) list of specifications to be provided in full in the Final Design submittal, and; (d) list (an outline/table of contents) of documents and plans to be prepared and submitted with Final Design.
 7. Real Estate Easements, Environmental Covenant, and permit requirements.
- B. Operation and Maintenance Plan: The Permittee shall prepare an Operation and Maintenance (O&M) Plan to cover both the implementation and long term maintenance of the corrective measure(s). The O&M Plan shall identify and describe the processes to occur, submissions required during O&M, and schedule for O&M activities consistent with remedial objectives set forth in the Statement of Basis and any amendments thereto. The O&M Plan shall include, but not be limited to, the following elements:

1. Description of routine O&M including tasks required to operate and maintain treatment systems or other components of corrective measures and a schedule showing frequency and duration of each O&M task.
2. Description of potential operating problems including the procedures to be used to analyze and diagnose potential operation problems, sources of information regarding problems, and common or anticipated trouble-shooting steps and remedies.
3. Description of routine monitoring and laboratory testing including a description of specific monitoring tasks required for the corrective measures, a description of required laboratory tests and their interpretation/reporting, a description of required QA/QC activities, and a schedule of monitoring frequency and date, if appropriate, and a description of what conditions may allow monitoring to cease or the frequency of monitoring to change.
4. Safety plan including description of precautions for specific equipment, etc., level of personal protection and type of monitoring for site personnel, and safety tasks required in the event of systems failure.
5. Description of equipment including the identification, layout and installation of monitoring components, maintenance of site equipment, and replacement schedule for equipment and installed components.
6. Records and reporting mechanisms including operating logs, inspections, laboratory records and test results, operating and maintenance cost records, mechanism for reporting emergencies, personnel and maintenance records, and progress reports to State and Federal agencies.

C. Health and Safety Plan: The Permittee shall prepare a Health and Safety Plan to address all work to be performed at the facility to implement the corrective measures provided in Cytec's Part B Permit, Module E, Condition E.9. This document will be submitted to Ohio EPA for review, although it does not require approval by Ohio EPA. The Health and Safety Plan shall be designed to protect on-site personnel, area residents, and visitors from physical, chemical and other hazards posed by the CMI, including pre-design studies if applicable.

The major elements of the Health and Safety Plan should include but not be limited to: facility description; description of known hazards and an evaluation of risks; list of key personnel responsible for site safety, delineation of work areas, description of protective clothing; procedures to control access; description of decontamination procedures for personnel and equipment; site emergency procedures; and procedures for protecting workers from weather-related problems.

The Health and Safety Plan, as appropriate, shall be consistent with U.S. EPA (1992) Standard Operating Safety Guides; U.S. EPA (2000) Hazardous Materials Incident Response Operations (165.5); OSHA regulations such as 29 CFR Section 1910.120 (Hazardous Waste Operations and Emergency Response); 29 CFR Section 1910.132 through 1910.138 (Personnel Protective Equipment); 29 CFR Section 1910.1000 (Air Contaminants); 29 CFR Part 1926 (Safety and Health Regulations for Construction); and U.S. Department of Health and Human Services (1985) Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities.

- D. Sampling and Analysis Plan/Performance Monitoring Plan: The Permittee shall update the Sampling and Analysis Plan, including the QAPP as necessary and appropriate, to reflect changes in the following: responsibility and authority; personnel qualifications; inspection activities; sampling requirements; and documentation and reporting. Additional revisions shall be made, or a separate document prepared (Performance Monitoring Plan), to describe the performance monitoring program that will be used to measure the effectiveness of the corrective measures provided in Cytec's Part B Permit, Module E, Condition E.9. The performance monitoring plan shall describe all sampling, monitoring, data analysis and reporting activities that will be completed to demonstrate the effectiveness of the corrective measures.
- E. Cost Estimate: The Permittee shall refine the cost estimate developed in the CMS to reflect the more detailed/accurate design plans being developed and specifications being developed. The cost estimate shall include both capital and O&M costs.

TASK III: CORRECTIVE MEASURES COMPLETION OF WORK (CMCW) REPORT

Following Ohio EPA approval of the Final CMI Design Report, the Permittee shall implement construction in accordance with procedures, specifications, and schedules in the Ohio EPA-approved Final CMI Design Report and the Ohio EPA-approved CMI Work Plan. During the Construction Phase, the Permittee will continue to submit periodic progress reports (Task IV). The Permittee shall also implement the elements of the approved Sampling and Analysis Plan and O&M plan, as necessary and appropriate. Upon completion of construction and an initial period of performance monitoring, and in accordance with the schedule included in the Ohio EPA-approved CMI Work Plan and the Ohio EPA-approved Final CMI Design Report, the Permittee will prepare and submit a CMI Corrective Measures Completion of Work (CMCW) Report.

The CMI CMCW Report shall describe activities performed during construction, provide actual specifications of the implemented remedy, and provide a preliminary assessment of CMI performance. The CMI CMCW Report shall include, but not be limited to, the following elements:

1. Synopsis of the corrective measures and certification of the design and construction;
2. Explanation of any modifications to the Ohio EPA-approved construction and/or design plans and why these were necessary for the project;
3. Listing of the criteria, established in the Ohio EPA-approved CMI Work Plan, for judging whether the corrective measures are functioning properly, and also explaining any modification to these criteria;
4. Certification by registered professional engineer that the construction is complete, consistent with contract documents and the Ohio EPA-approved Final CMI Design;
5. Signature of the Permittee's responsible official as designated in accordance with Permit Condition A.13; and
6. A summary of the Field log book, any problem identification and correction, photographic records, deviations from design and material specifications (with justifying documentation), and as-built drawings.

TASK IV: PROGRESS REPORTS AND SUBMISSIONS

The Permittee shall prepare plans, drawings, specifications, and reports as set forth in Tasks I through III to document the design, construction, operation, maintenance, and monitoring of the corrective measure. The documentation shall include, but not be limited to, the following:

- A. Quarterly Progress Reports of CMI: Until the Corrective Measures have been completed, the Permittee shall provide Ohio EPA with signed, quarterly progress reports containing:
 1. A description of the work performed during the preceding monitoring interval and estimate of the percentage of the CMI completed;
 2. Summaries of all findings;
 3. Summaries of all changes made in the CMI during the reporting period;
 4. Summaries of all contacts with representatives of the local community, public interest groups, or State or local government during the reporting period;
 5. Problems encountered and any actions taken to rectify problems;
 6. Changes in personnel during the reporting period;

7. Projected work for the next reporting period; and
 8. Copies of daily reports, inspection reports, laboratory/monitoring data, etc.
- B. Annual Progress Reports: Once the Corrective Measures have been completed, the Permittee shall provide Ohio EPA with signed annual progress reports and/or Corrective Measures Assessment Reports containing:
1. A narrative summary of principal activities conducted during the reporting period;
 2. Graphical or tabular presentations of monitoring data, including but not limited to ground water levels and flow direction, and ground water quality;
 3. A schedule of sampling and field activities to be performed and reported in the following year; and
 4. A Corrective Measures Assessment Report assessing the performance of the corrective measures over time. The Assessment Report shall include:
 - a. Summarized data representing corrective measure performance
 - b. Any proposed changes to the corrective measure and summary of previous changes;
 - c. Iso-concentration maps for each contaminant of concern listed in the CMI Design Plan; and
 - d. Statistical assessment of the progress of the corrective measure towards achievement of media clean-up standards.
- C. Five-Year Report: In lieu of every fifth annual report, the Permittee shall provide Ohio EPA with signed Five-Year Corrective Measures Progress Reports containing:
1. All items required for the Annual Progress Reports; and
 2. In depth analysis of the CMI including:
 - a. Complete re-assessment of models, plans and goals used by the CMI process;
 - b. Changes and/or additions to the existing systems that may be required to meet CMI goals.

- c. Notification that corrective actions media cleanup standards have been achieved, when appropriate.

- D. Attainment of Ground Water Performance Standards Report: Within 30 days after the Permittee concludes that the ground water performance standards have been attained, the Permittee shall submit a written report and certification to Ohio EPA for review and approval. In the report, an independent registered professional engineer and the Permittee's Project Coordinator shall state that the ground water performance standards have been attained in full satisfaction of the requirements of this Permit. The report shall be signed by a responsible official in accordance with Permit Condition A.13.

- E. Final Completion of Work Report: This report shall be submitted by the Permittee when construction is complete, performance standards have been attained, and O&M is complete. Within 30 days after the Permittee concludes that all phases of the work (including O&M and monitoring) have been completed, the Permittee shall schedule and conduct a pre-certification inspection to be attended by representatives of the Permittee and Ohio EPA. After the pre-certification inspection and any pre-final or subsequent final inspections required by Ohio EPA, the Permittee shall submit, within 30 days of a successful final inspection, a written Completion of Work Report to Ohio EPA for approval. In the report, an independent registered professional engineer and the Permittee's Project Coordinator shall state that the corrective measures have been completed in full satisfaction of the requirements of this permit. The written report shall include as-built drawings stamped by a registered professional engineer, unless there were no modifications to the corrective measures after submittal of as-built drawings at the completion of construction. The report shall be signed by a responsible official in accordance with Permit Condition A.13.

F. Submittal Summary: A summary of the information reporting requirements is presented in the table below:

Submittal	Due Date
Draft CMI Work Plan Project Management Plan Public Involvement Plan	Within 90 days after the effective date of remedy selection.
Final CMI Work Plan (revision of Draft CMI Work Plan)	30 days after receipt of Ohio EPA's comments on Draft CMI Work Plan
Draft Final Design Report Design Plans and Specifications Operation and Maintenance Plan Health and Safety Plan/ Sampling Analysis Plan/Performance Monitoring Plan Cost Estimate	In accordance with the schedule in the Final CMI Work Plan
Final Design Report	30 days after receipt of Ohio EPA's comments on Draft Final Design Report.
CMI Report Overview of CMI, design certification & construction, Explanation of modifications to approved plan Performance criteria listing Certification by Registered Professional Engineer	In accordance with the approved design schedule
Quarterly Progress Reports	Submitted by the last of every third month until completion of corrective measures.
Annual Progress Reports	Submitted in January, annually, except for years requiring a Five-year Report.
Five Year Report	Submitted in January every five years.
Attainment of Ground Water Performance Standards Report	Within 30 days after the Permittee concludes that the ground water performance standards have been attained.
Corrective Measures Completion of Work (CMCW) Report	In accordance with the schedule in the Final CMI Work Plan and Final CMI Design Report.
Final Completion of Work Report	30 days after the Permittee concludes that all phases of the work (including O&M and monitoring) have been completed.

MODULE F - POST-CLOSURE CARE

F. POST-CLOSURE CARE

This module covers post-closure care activities for Pond 1 and Pond 2. Pond 2 has been “clean-closed” by risk-based standards in soils; however, a ground water contamination plume extends from the unit and must be monitored for a period of 30 years in accordance with the site-wide Integrated Ground Water Monitoring Plan, unless the director of Ohio EPA approves a petition from Cytec to reduce the post-closure care period in accordance with OAC Rule 3745-55-17(A)(2). The Pond 1 closure plan was amended to close the unit as a landfill instead of risk-based clean-closure. Certification of landfill closure for Pond 1 was submitted to Ohio EPA in November 2005. The individual post-closure ground water monitoring plans for Pond 1 and Pond 2 were replaced by a site-wide Integrated Ground Water Monitoring Program. The Permittee submitted a corrective action program for remediation of contaminated ground water from Pond 1 and Pond 2 concurrent with the submittal of the Corrective Measures Study required by Permit Condition E.8. Implementation of the selected remedy was performed pursuant to Permit Condition E.9.

F.1 Unit Identification

The Permittee must provide post-closure care for the following hazardous waste management units, subject to the terms and conditions of this permit:

Type of Waste Unit	Unit No. or Other Designation	Maximum Waste Inventory	Description of Wastes Contained	Hazardous Waste No.	Year Post-closure began
Surface Impoundment	Pond 1	33,000 yd ³	Production wastes	F004	2005
Surface Impoundment	Pond 2	70,900 yd ³	Pond 1 supernatant, laboratory wastes, leachate	F004	1997

F.2 Post-closure Procedures and Use of Property
 OAC Rule 3745-55-17

- (a) The Permittee must conduct post-closure care for each hazardous waste management unit listed in Permit Condition F.1 above, to begin after completion of closure of the unit and continue for 30 years after that date. The 30-year post-closure care period may be shortened upon application and demonstration approved by Ohio EPA that the reduced period is sufficient to protect human health and the environment. The 30-year post-closure care period may be extended if the Director finds that the extended period is necessary to protect human health and the environment. For landfill type (i.e.,

waste-in-place) closures, the ground water must be monitored for a period of either 30 years or until such time as established concentration limits are achieved for a period of three consecutive years (i.e. 6 consecutive semi-annual sampling events).

- (b) The Permittee must maintain and monitor the ground water monitoring system and comply with all other applicable requirements of OAC Rules 3745-54-90 through 3745-54-101 during the post-closure period.
- (c) The Permittee must comply with the requirements for surface impoundments as follows:
 - (i) Maintain the integrity and effectiveness of the final cover, including making repairs to the final cover, as necessary, to correct the effects of settling, subsidence, erosion, and other events; and
 - (ii) Prevent run-on and run-off from otherwise damaging the final cover.
- (d) Reserved
- (e) The Permittee must comply with all security requirements, as specified in the permit application.
- (f) The Permittee must not allow any use of the units designated in Permit Condition F.1 which will disturb the integrity of the final cover, liners, any components of the containment system, or the function of the facility's monitoring systems during the post-closure care period.
- (g) The Permittee must implement the post-closure plan for Pond 1 and Pond 2. All post-closure care activities must be conducted in accordance with the provisions of the post-closure plan.

F.3 Inspections
OAC Rule 3745-55-18(B)

The Permittee must inspect the components, structures, and equipment at the facility in accordance with the inspection schedule found in the post-closure plan.

F.4 Notices and Certification
OAC Rules 3745-55-19 and 3745-55-20

- (a) No later than 60 days after certification of closure of each hazardous waste disposal unit, the Permittee must submit to the local zoning authority, or the authority with jurisdiction over local land use, and to the Director, a record of the type, location, and quantity of hazardous wastes disposed of within each cell or other disposal unit of the facility. For hazardous wastes disposed of

before January 12, 1981, the Permittee must identify the type, location, and quantity of the hazardous wastes to the best of his knowledge and in accordance with any records he has kept.

- (b) Within 60 days after certification of closure of the first and the last hazardous waste disposal unit, the Permittee must:
 - (i) Record, in accordance with Ohio law, a notation on the deed to the facility property, or on some other instrument that is normally examined during the title search, that will in perpetuity notify any potential purchaser of the property that:
 - (1) The land has been used to manage hazardous wastes;
 - (2) Its use is restricted under OAC Rules 3745-55-10 thru 3745-55-20; and
 - (3) The survey plat and record of the type, location, and quantity of hazardous wastes disposed of within each cell or other hazardous waste disposal unit of the facility have been filed with the Director and the city of Marietta.
 - (ii) Submit a certification to the Director, signed by the Permittee, that he has recorded the notation specified in Permit Condition F.4(b)(i), including a copy of the document in which the notation has been placed.
- (c) If the Permittee wishes to remove hazardous wastes and hazardous waste residues, the liner, if any, or contaminated soils, then he must request a modification to this permit in accordance with the applicable requirements in OAC Rules 3745-50-40 to 3745-50-66. The Permittee must demonstrate that the removal of hazardous wastes will satisfy the criteria of OAC Rule 3745-55-17(C).

By removing hazardous waste, the Permittee may become a generator of hazardous waste and must manage it in accordance with all applicable hazardous waste requirements.

If the Permittee is granted a permit modification or otherwise granted approval to conduct such removal activities, the Permittee may request that the Director approve either:

- (i) The removal of the notation on the deed to the facility property or other instrument normally examined during title search, or
- (ii) The addition of a notation to the deed or instrument indicating the

- (d) No later than 60 days after completion of the established post-closure care period for each hazardous waste disposal unit, the Permittee must submit to the Director, by registered mail, a certification that the post-closure care period for the hazardous waste disposal unit was performed in accordance with the specifications in the approved post-closure plan. The certification must be signed by the Permittee and an independent, qualified, registered professional engineer registered in the State of Ohio. Documentation supporting the independent, qualified, registered professional engineer's certification must be furnished to the Director upon request until the Director releases the Permittee from the financial assurance requirements for post-closure care under OAC Rule 3745-55-45.

F.5 Financial Assurance
OAC Rule 3745-55-45

- (a) The Permittee must maintain financial assurance during the post-closure period and comply with all applicable requirements of OAC Rules 3745-55-40 through 3745-55-51.
- (b) Reserved
- (c) Reserved

F.6 Post-closure Permit Modifications
OAC Rule 3745-55-18(D)

The Permittee must request a permit modification to authorize a change in the approved post-closure plan. This request must be in accordance with applicable requirements of OAC Rules 3745-50-40 to 3745-50-66, and must include a copy of the proposed amended post-closure plan for approval by the Director. The Permittee must request a permit modification whenever changes in operating plans or facility design affect the approved post-closure plan, there is a change in the expected year of final closure, or other events occur during the active life of the facility that affect the approved post-closure plan. The Permittee must submit a written request for a permit modification at least 60 days prior to the proposed change in facility design or operation, or no later than 60 days after an unexpected event has occurred which has affected the post-closure plan.

MODULE G - INTEGRATED GROUND WATER MONITORING
OAC Rule 3745-54-101

G. INTEGRATED GROUND WATER MONITORING

This module presents permit conditions addressing the requirements for an integrated ground water monitoring program at Cytec Industries Inc. Marietta facility. Ground water contamination from the hazardous waste management units (HWMUs) regulated under OAC Rules 3745-54-90 through 3745-54-100 has co-mingled with ground water contamination from solid waste management units (SWMUs) regulated under OAC Rule 3745-54-101 at the site. Therefore, it is not practical to separate the HWMUs and SWMUs either for ground water monitoring purposes or remedial efforts. A more efficient multifaceted approach is to combine the relevant portions of OAC Rules 3745-54-100 and 3745-54-101 for these areas. This combined approach is hereafter referred to as the Integrated Ground Water Monitoring Program or IGWMP.

Two hazardous waste management units regulated under OAC Rules 3745-54-90 through 3745-54-101 exist at the facility. These former surface impoundments are labeled Pond 1 and Pond 2 on Figure 1 of Appendix E-7 Integrated Ground Water Monitoring Program (April 2014) found in the permit application. Much of the waste has been removed from Pond 1 and the excavation has been backfilled. However, residual waste remains in sidewalls and bedrock at the base of the excavation. All wastes and contaminated soils have been removed from Pond 2 and the excavation has been backfilled.

Thirty-three (33) solid waste management units have been identified at the site. These units consist of landfills, former surface impoundments (including Ponds 1 and 2), storage areas, process areas and disposal areas. The SWMUs are listed in Module G.1(a) below and described in Module J and Table J-1 of the Part B permit application.

Ground water at the site is found in the following three hydrogeologic units which comprise the uppermost aquifer: unconsolidated overburden, weathered bedrock, and competent bedrock. The unconsolidated overburden at the site ranges from 0 to greater than 50 feet in thickness. This unit is thinnest near the base of the hills along the western and northern borders of the site, in the vicinity of Ponds 1 and 2, and areas immediately west of Hunter Avenue and north of well W-5. The overburden primarily consists of tan to brown, gray and dark green silty clays.

Weathered bedrock encountered below the unconsolidated overburden consists of weathered shale and weathered sandstone ranging from 2 feet to 22 feet in thickness. In some areas, zones within the weathered bedrock interval have completely broken down from sandstone to sand and from shale or mudstones to silty clays. This sometimes makes it difficult to distinguish the contact with the unconsolidated overburden.

Competent bedrock, belonging to the Dunkard and Monongahela Group of the Pennsylvanian System, underlies the weathered bedrock at the site. These rock units consist primarily of sandstone and shale. In general, a higher percentage of sandstone is

present in the upper portions of the bedrock at the site above 560 feet mean sea level (MSL). The competent bedrock interval below 560 feet MSL consists predominantly of shales. The shales grade to, and are interbedded with, shaley siltstones. The deepest bedrock penetrated at the site consists of oil bearing shale at an elevation of 480 feet to 510 feet MSL.

Based on the results of the Permittee's final status ground water monitoring program and samples collected from wells monitoring SWMUs, each of the three hydrogeologic units has been impacted with hazardous waste constituents. In general, site ground water flows east with hazardous waste constituents in ground water ultimately discharging to Duck Creek. Ground water samples from wells located east of Duck Creek indicate that hazardous waste constituents have not migrated in ground water beyond the Permittee's facility boundary, nor to the east of Duck Creek.

Concentration limits established in Table 1 in Appendix E-7 in accordance with OAC Rule 3745-54-94 of the Ground Water Protection Standard (GWPS) are known to be historically and currently exceeded at the Permittee's point of compliance. Therefore, the Permittee is required to implement a corrective action program in accordance with OAC Rule 3745-54-101 to bring the regulated units back into compliance with the GWPS. In lieu of the requirement to submit to the director a permit modification to establish a corrective action program meeting OAC Rule 3745-54-101, the Permittee proposed a compliance schedule in accordance with OAC Rule 3745-50-44(B)(8)(e). Ohio EPA approved the compliance schedule in a letter dated February 4, 1998. A remedy for site-wide ground water was presented in the CMS Report submitted to Ohio EPA in May 2007 (with revisions through July 2008). Ohio EPA initiated a draft permit modification to incorporate the remedy selection as described in the Statement of Basis in a February 11, 2010 letter. The permit modification was finalized on April 20, 2011 and incorporated into the final remedy for ground water which included hydraulic control via pumping and treating, if necessary, the extracted ground water prior to discharge to the Marietta POTW. A design document for the hydraulic control will be submitted to Ohio EPA in the near future. This document may include additional wells to monitor effectiveness of the remedy.

G.1. Applicability

OAC Rule 3745-54-101

- (a) The Permittee must comply with the applicable requirements in OAC Rule 3745-54-101 and institute corrective action as necessary to protect human health and the environment for all releases of hazardous wastes or constituents from any waste management unit/area at the facility, regardless of the time at which waste was placed in such unit/area for the following units/areas

A RCRA Facility Assessment (RFA) was conducted by U.S. EPA, and consisted of a preliminary review (PR) and visual site inspection (VSI). The RFA/PR was performed in May 1986 and the RFA/VSI was performed in November 1990. Twenty-six (26) WMUs were identified

in this process. These units consist of three (3) landfills, three (3) ponds, eleven (11) storage areas, three (3) disposal areas, and six (6) process areas. Subsequent to the initial report, additional waste management units were identified, bringing the total to thirty-three (33) WMUs. These units are listed below and described in Module J and Table J-1 of the Part B permit application.

SWMU #	Description	Status	Completed - Y/N
1	North Landfill	Remedy selected in statement of basis (SOB) - slurry wall, cap augmentation, 100-yr flood protection, hydraulic control of ground water, IC/EC	N
2	North Storage Yard	Remedy selected - IC/EC	N
3	South Landfill	Remedy selected - IC/EC, wetland restoration	N
4	Central Landfill	Included w/Pond 1 closure as landfill	Y
5	Caustic Wastewater Pretreatment Unit	Included w/Pond 1 closure as landfill	Y
6	Oxidation Wastewater Pretreatment Unit	NFA - Was located on 2nd floor of Building 22	Y
7	Chlorine/Acid Wastewater Pretreatment Unit (west of Bldg 22)	Included w/Pond 1 closure as landfill	Y
8	Pond 1	Closed as a landfill - in post-closure monitoring; deed recorded	Y
9	Building 62 Interior	NFA - RCRA clean closed	Y
10	Building 60 Outside North	Remedy implemented (cap)	Y
11	Eastern Disposal Area	Remedy selected - IC/EC, wetland restoration	N
12	Cooling Water Pond	NFA - IRM completed	Y
13	Pond 2	NFA - RCRA risk-based clean closed, in post-closure	Y
14	West Disposal Area	NFA - IRM completed and area included w/Pond 1 closure as landfill	Y
15	Neutralization Pit	NFA - IRM completed with SWMU 4 IRM and area included w/Pond 1 closure as landfill	Y
16	Drum Rinse Area	NFA - IRM completed with SWMU 4 IRM and area included w/Pond 1 closure as landfill	Y
17	Building 20 South	NFA - IRM completed with SWMU 4 IRM and area included w/Pond 1 closure as landfill	Y
18	Building 20 Inner Bay	NFA - was located inside building	Y
19	Cooling Pond North	Remedy selected - IC/EC	N
20	North Equipment Storage Area	Remedy selected - IC/EC	N
21	Wastewater Treatment Plant - Equalization Basin	NFA	Y
22	Wastewater Treatment Plant - Spill Basin	NFA	Y
23	Building 23 West	NFA - IRM completed with SWMU 4 IRM and area included w/Pond 1 closure as landfill	Y

24	Building 60	NFA - building removed	Y
25	Pond 1 Extension	NFA	Y
26	East Storage Pad	Remedy implemented (excavation w/off-site disposal)	Y
27	Process Piping to Pond 1	NFA - IRM completed with SWMU 4 IRM	Y
28	Piping from Pond 1 to Pond 2	NFA - IRM completed	Y
New	OSC-A	Remedy implemented (cap)	Y
New	West Tank Farm	Included w/Pond 1 closure as landfill	Y
New	Building 60/62	Included w/SWMU 10 remedy implementation	Y
New	Building 20/22/30/31/32/33 Complex	Included w/Pond 1 closure as landfill	Y
New	Discharge Pipe under S3/11 to Duck Creek, east of Hunter Ave	Remedy implemented w/SWMU 3 and 11 remedy (excavate w/off-site disposal)	Y
New	Drainage swale east of S3/11	NFA	Y
	Ground water	Remedy selected - hydraulic control	N

IC - Institutional Control
EC – Environmental Covenant

SWMUs 8 and 13 are also considered HWMUs (Pond 1 and Pond 2, respectively). All wastes have been removed from Pond 1, however some contaminated soil remains. Due to the contaminants that remained in Pond 1, the Pond 1 closure plan was amended to close the unit as a landfill instead of risk-based clean-closure. Certification of landfill closure for Pond 1 was submitted to Ohio EPA in November 2005. At Pond 2, wastes and contaminated soils have been removed to the extent practical, and the excavation has been backfilled. Due to residual contamination and ground water contamination above concentration limits, Pond 2 is considered closed as a landfill and is in post-closure care. Ground water contamination from both Pond 1 and Pond 2 will be addressed by hydraulic control as described in the CMS. Both Pond 1 and Pond 2 have previously been monitored under OAC Rules 3745-54-90 through 3745-55-01. OAC Rule 3745-55-01 has subsequently been replaced by OAC Rule 3745-54-101 as cited throughout this module.

- (b) Additional Areas of Concern Reserved
- (c) The owner or operator must implement corrective actions beyond the facility property boundary, where necessary, to protect human health and the environment, unless the owner or operator demonstrates to the satisfaction of the director that, despite the owner's or operator's best efforts, the owner

or operator was unable to obtain the necessary permission to undertake such actions. The owner/operator is not relieved of all responsibility to clean up a release that has migrated beyond the facility boundary where off-site access is denied. On-site measures to address such releases will be determined on a case-by-case basis. Assurances of financial responsibility for such action must be provided.

G. 2. Ground Water Remediation Standard (GWRS)

The Permittee must ensure that the hazardous constituents or constituents detected in the ground water from a unit/area listed in this Permit Condition do not exceed the clean-up standards in the uppermost aquifer underlying the units/areas beyond the point of compliance during the permit period and to respond with any necessary corrective action to bring the ground water back into compliance with those standards. The GWRS has been established in this Permit due to hazardous constituents being detected in the ground water.

(a) List of Hazardous Constituents and Ground Water Clean-Up Standards

The Permittee must monitor the ground water to determine whether units/areas are in compliance with the GWRS. The hazardous constituents listed in the Appendix to OAC Rule 3745-54-98 detected in the ground water above their respective PQLs underlying a unit/area and reasonably expected to be contained in or derived from the waste contained in the unit/area to which the GWRS applies and their ground water clean-up standards are listed below:

<u>Volatile Organic Constituents</u>	<u>Limit (µg/L)</u>
Acetone	100
Benzene	5*
Bromodichloromethane	5
Bromoform	5
2-butanone (MEK)	100
Carbon Disulfide	5
Carbon tetrachloride	5*
Chlorobenzene	100*
Chloroethane	10
2-chloroethyl vinyl ether	10
Chloroform	5
Chloromethane	10
1,1-Dichloroethane	5
1,2-dichloroethane	5*
1,4 Dioxane	100
Ethyl benzene	700*
Methylene chloride	5*
4-methyl-2-pentanone	10

1,1,2,2-tetrachloroethane	5
Tetrachloroethene	5*
Toluene	1000*
1,1,2-Trichloroethane	5*
Trichloroethene	5*
1,2,2-Trichlorotrifluoroethane	10
Vinyl Chloride	2*
Total Xylenes	10,000*

Semivolatle Organic Constituents

Acenaphthene	5
Aniline	5
Anthracene	5
Benzo (a) anthracene	5
Benzo (a) pyrene	5
Benzo (b) fluoranthene	5
Benzo (k) fluoranthene	5
bis (2-chloroethoxy) methane	5
bis (2-chloroethyl) ether	5
bis (2-ethylhexyl) phthalate	6*
2-chloroaniline	5**
4-chloroaniline	5
4-chloro-3-methyl phenol	5
2-chlorophenol	5
Chrysene	5
Dibenzofuran	5
1,2-dichlorobenzene	600*
1,3-dichlorobenzene	5
1,4-dichlorobenzene	75*
3,3-dichlorobenzidine	10
2,4-dichlorophenol	5
Diethylphthalate	5
Di-n-butyl phthalate	5
2,4 dinitrotoluene	5
Fluoranthene	5
Fluorene	5
Hexachlorobenzene	5
Indeno (1,2,3-cd) pyrene	5
2-Methylnaphthalene	5
Naphthalene	5
1-Naphthylamine	50
2-nitroaniline	25
Nitrobenzene	5
4-nitrophenol	25
N-nitrosodiphenylamine	5
Phenanthrene	5

Phenol	5
2-Picoline	5
Pyrene	5
1,2,4,5-Tetrachlorobenzene	5
1,2,4-trichlorobenzene	70*
2,4,6-trichlorophenol	5

*Concentrations based on MCLs, all others based on PQLs from Kemron Environmental Laboratory of Marietta, Ohio (current as of March 2003).

**PQL not available – concentration limit based on similar toxicity rating to 4-chloroaniline which has a PQL of 5 µg/L.

<u>Pesticides</u>	<u>Limit (µg/L)</u>
Aldrin	0.05
alpha-BHC	0.05
beta-BHC	0.05
delta-BHC	0.05
gamma-BHC (Lindane)	0.2*
alpha-Chlordane	0.05
gamma-Chlordane	0.05
4-4'DDD	0.10
4-4'DDE	0.10
4-4'DDT	0.10
Dieldrin	0.10
Endosulfan I	0.05
Endosulfan II	0.10
Endosulfan sulfate	0.10
Endrin	2*
Endrin Aldehyde	0.10
Endrin Ketone	0.10
Heptachlor	0.4*
Heptachlor epoxide	0.2*
Methoxychlor	40*
<u>Herbicides</u>	
2,4-D	70*
2,4,5-T	0.2
2,4,5-TP (Silvex)	50*
<u>Metals (Dissolved)/ Inorganic Constituents</u>	
Antimony	6*
Arsenic	10*
Barium	2000*
Cadmium	5*
Chromium	100*

Lead	15**
Mercury	2*
Nickel	100*
Selenium	50*
Silver	100*
Vanadium	10
Zinc	5000*
Alkalinity	NA***
Sulfate	NA
Sulfide	NA

*Concentrations based on MCLs, all others based on PQLs from Kemron Environmental Laboratory of Marietta, Ohio (current as of March 2003).

**Concentration Based on Action Level, all others based on PQLs from Kemron Environmental Laboratory of Marietta, Ohio (current as of March 2003).

*** NA = Not Applicable

Ground Water Quality Field Parameters:

In addition to the hazardous constituents listed above, the Permittee must monitor the following parameters: Temperature, pH, Specific Conductance, and Turbidity.

(b) Point of Compliance

The Permittee has integrated the unit-specific ground water monitoring programs site-wide due to their close proximity to each other. The combined point of compliance (POC) at which the GWRS applies is indicated on Figure 1 of Appendix E-7 in the permit application. The Permittee must monitor the wells listed in Table 3 of Appendix E-7 in the permit application representing the quality of ground water passing the point of compliance. The Permittee must also monitor the ground water, as necessary, between the point of compliance and the downgradient property boundary to determine if the clean-up standard has been exceeded at any point between the compliance point and the downgradient property boundary.

(c) Permit Period

The permit period, during which the GWRS applies, is equal to 10 years. The permit period must begin upon the date of permit approval and must end ten years after the approval date. During the permit period, the Permittee must establish and implement a monitoring program that will detect, respond, and report as necessary to protect human health and the environment all releases of hazardous constituents above the clean-up standards at the point of compliance and between the point of compliance and the downgradient

facility boundary. The Permittee shall implement corrective action beyond the facility property boundary, where necessary, to protect human health and the environment.

G.3. Well Location, Installation, Maintenance, and Removal

- (a) The Permittee’s ground water monitoring system must consist of a sufficient number of wells, installed and screened at appropriate locations and depths to yield ground water samples from the unconsolidated overburden, weathered bedrock, and competent bedrock zones which are considered to be the uppermost aquifer. The samples must:
 - (i) Represent the quality of background ground water that has not been affected by leakage from the units/areas;
 - (ii) Represent the quality of ground water passing the point of compliance (Primary Compliance), between the point of compliance and the downgradient property boundary (Secondary Compliance), and beyond the property boundary, where necessary, to protect human health and the environment;
 - (iii) Allow for the detection and measurement of contamination for all potential release pathways to the uppermost aquifer from the waste management units/areas based on site-specific hydrogeologic characterization when hazardous constituents have migrated from the unit/area to the uppermost aquifer; and
 - (iv) Demonstrate the effectiveness of any corrective action program. The well system should be as effective in determining compliance with the GWRS and in determining the success of the corrective action program.
- (b) The monitoring system consists of the ground water wells as specified in Figure 1 and Table 3 of Appendix E-7 in the permit application and in conformance with the following list:

Well Identifier	Upgradient/ Downgradient	Purpose
W-1AR	Upgradient	Background
W-20	Upgradient	Background
W-20B	Upgradient	Background
W-37wt	Upgradient	Background

Well Identifier	Upgradient/ Downgradient	Purpose
W-43wtR	Downgradient	Primary Compliance
W-18	Downgradient	Primary Compliance
W-7A	Downgradient	Primary Compliance
W-7B	Downgradient	Primary Compliance
W-6	Downgradient	Primary Compliance
W-6B	Downgradient	Primary Compliance
W-5	Downgradient	Primary Compliance
W-16	Downgradient	Primary Compliance
W-17	Downgradient	Primary Compliance
W-27	Downgradient	Primary Compliance
W-13	Downgradient	Primary Compliance
W-32wtR	Downgradient	Primary Compliance
W-32WB	Downgradient	Primary Compliance
W-32B	Downgradient	Primary Compliance
W-30wtR	Downgradient	Primary Compliance
W-30WB	Downgradient	Primary Compliance
W-30B	Downgradient	Primary Compliance
W-29	Downgradient	Primary Compliance
W-31WB	Downgradient	Primary Compliance
W-10R1	Downgradient	Secondary Compliance
W-14	Downgradient	Secondary Compliance
W-22	Downgradient	Secondary Compliance
W-23	Downgradient	Secondary

Well Identifier	Upgradient/ Downgradient	Purpose
		Compliance
W-35WB	Downgradient	Secondary Compliance
W-24	Downgradient	Secondary Compliance
W-46WB	Downgradient	Secondary Compliance

- (c) Wells identified in Permit Condition G.3(b) must be cased in a manner that maintains the integrity of the monitoring well bore hole and complies with the detailed plans and specifications presented in Table 2 of Appendix E-7 of the permit application. The casing must be screened and packed with gravel or sand, where necessary, to enable collection of ground water samples. The annular space above the sampling depth must be sealed to prevent contamination of samples and the ground water.

Appendix E-8 of the permit application contains ground water monitoring well logs and construction diagrams which illustrate compliance with this Permit Condition.

- (d) The Permittee must remove or replace any monitoring well in Permit Condition G.3(b) in accordance with the Appendix to OAC Rule 3745-50-51 permit modification process. Each change must be accompanied by a revised map as specified on Figure 1 of Appendix E-7 found in the permit application for Permit Condition G.3(b).
- (e) Whenever any of the wells specified in Permit Condition G.3(b) are replaced, the Permittee must demonstrate to Ohio EPA that the ground water quality at the replacement well meets the criteria in Permit Condition G.3(a) within 90 days of the date of replacement using means appropriate to the reason for replacement.

G.4. Sampling and Analysis Procedures

- (a) The Permittee must implement an IGWMP per Section E Appendix E-7 of the permit application. This program includes consistent sampling and analysis procedures designed to ensure monitoring results that provide a reliable indication of ground water quality below the units/areas and is in compliance with this Permit Condition.
- (b) The Permittee's IGWMP per Section E Appendix E-7 of the permit

application includes sampling and analytical methods that are appropriate for ground water sampling and that accurately measure hazardous constituents in ground water samples.

- (c) Field and analytical data must be validated in accordance with the procedures specified in Section E Appendix E-7 of the permit application.

G.5. Ground Water Surface Elevation

The Permittee must determine the ground water surface elevation at each well identified in the table in Permit Condition G.3(b) each time ground water is sampled using the methods in Section 3.1 of Appendix E-7 of the permit application.

G.6. Sampling Frequency

Data on each hazardous constituent specified in Permit Condition G.2(a) will be collected from all wells listed in Permit Condition G.3(b). The sampling procedure and interval for each constituent are described in Section 3.3 and Table 3 of Appendix E-7 of the permit application.

- (a) The number and kinds of samples collected to establish background must be appropriate for the form of statistical test employed, following generally accepted statistical principles.
- (b) The sample size must be as large as necessary to ensure with reasonable confidence that a contaminant release to ground water from a facility will be detected.
- (c) Background data must be updated as necessary in accordance with Appendix E-7 of the permit application to provide an accurate representation of background ground water quality. New or revised background values must be established in the permit through the permit modification process in OAC Rule 3745-50-51.

G.7. Statistical Procedures

The Permittee must use the following statistical procedures in evaluating ground water monitoring results for each hazardous constituent in Permit Condition G.2(a) in each well in Permit Condition G.3(b) to identify statistically significant evidence of contamination, the exceedance of a clean-up standard, and/or the effectiveness of corrective action:

- (a) For those constituents for which background values have not been collected and established at the time of the permit application, the Permittee must choose and submit to Ohio EPA the appropriate statistical method within 45 days after the receipt of the last background sampling event data through the

permit modification process in OAC Rule 3745-50-51.

For those constituents with previously collected background values, the Permittee must conduct statistical procedures as presented in Section 4 of Appendix E-7 of the permit application.

- (b) The Permittee's statistical procedures must be protective of human health and the environment, provide reasonable confidence that the migration of hazardous constituents from a unit/area into and through the aquifer will be indicated, and be able to determine whether such leakage of hazardous constituents into the ground water exceeds specified clean-up standards. The statistical procedures must comply with the following performance standards:
- (i) The statistical evaluation of ground water monitoring data must be conducted separately for each hazardous constituent specified in Permit Condition G.2(a) in each well.
 - (ii) The statistical method must be appropriate for the distribution of the data used to establish background or clean-up standards. If the distributions of the constituents differ, more than one statistical method may be needed.
 - (iii) The statistical method must provide a reasonable balance between the probability of falsely identifying a non-contaminating and/or exceeding unit/area and the probability of failing to identify a contaminating and/or exceeding unit/area.
 - (iv) If a control chart approach is used, the specific type of control chart and its associated parameter values must be proposed by the Permittee with a permit modification request and approved in the permit.
 - (v) If a prediction interval procedure is used, the levels of confidence and the percentage of the population that the interval must contain, must be proposed by the Permittee with a permit modification request and approved in the permit. These parameters must be determined after considering the number of samples in the background data base, the data distribution, and the range of concentration values for each constituent of concern.
 - (vi) The statistical method must account for data below the limit of detection with one or more statistical procedures. Any practical quantitation limit (PQL) approved in the permit that is used in the statistical method must be the lowest concentration level that can be reliably achieved within specified limits of precision and accuracy

during routine laboratory operating conditions that are available to the Permittee.

- (vii) If necessary, the statistical method must include procedures to control or correct for seasonal and spatial variability as well as temporal correlation in the data.

G.8. Operating Record and Reporting
OAC Rules 3745-54-73 and 3745-54-77

(a) Operating Record

The Permittee must enter all of the following information obtained in accordance with Permit Module G in the operating record:

- (i) Ground water monitoring data collected in accordance with this permit including actual levels of constituents.
- (ii) The laboratory results from each of the wells and their associated qualifiers including the laboratory sheets for the full volatile and semi-volatile analyses (must include method codes, method detection limits, and units of measurement);
- (iii) The date each well was sampled (tabulated);
- (iv) The date, time, and identification of all blanks and duplicates;
- (v) Any field log documentation of deviation from the procedures in Appendix E-6 of the permit application, including documentation of parameter omissions during the sampling event;
- (vi) The date the Permittee received the results from the laboratory;
- (vii) The date the owner or operator completed their review of the analytical laboratory's verification of the accuracy and precision of the analytical data and determined its quality.
- (viii) The results of the data validation review per Permit Condition G.8(a)(vii) including: report completeness, chain of custody, sample receipt form, signed statement of validity, technical holding time review, data qualifiers including their definitions, dilutions, blank data, spikes, spike recovery %, surrogate recovery, and an explanation of any rejected results;
- (ix) Results of all blanks and duplicates (trip, field, equipment, and method);

- (x) Results of the field parameters;
- (xi) The statistical evaluation of the data (must include all computations, results of statistical tests, and date the statistical evaluation was completed);
- (xii) Any change in well status (i.e., going from unaffected to affected status and vice versa);
- (xiii) Ground water surface elevations taken at the time of sampling each well;
- (xiv) Data and results of the annual determination of the ground water flow rate and direction;
- (xv) The results of the last three years of all inspections required under OAC Rule 3745-54-15(D) related to ground water monitoring and equipment as required under OAC Rule 3745-54-73(B)(5).
- (xvi) Evaluation of the efficiency of any corrective actions performed to bring the ground water quality into compliance with the GWRS per Permit Condition G.2.

(b) Annual, Semi-Annual and Other Periodic Required Reporting

(i) Required Annual Reporting

The Permittee must submit an annual report to the Director by March 1st of the following year. The annual reports must reference the titles and dates of any other periodic reports required by the permit or any updates to those reports, but generally do not need to include duplicates of hard copies previously submitted.

The annual reports must include, at a minimum, the analytical results required by Permit Conditions G.6 and G.9, the ground water elevation data required by Permit Condition G.5 and G.8(a)(xi) and (xiii), and the results of any statistical analyses required by Permit Condition G.7 and G.9. In addition, a copy on disk of all ground water and blank data must be submitted electronically in the format supplied by the Director, a hard copy of well-specific information (location (latitude and longitude), depth, construction, etc.) for any new/replacement wells, and any other information specified in the instructions for the annual report not addressed in this Permit Condition must be submitted.

(ii) Required Corrective Action Annual Reporting

The Permittee must report, in writing, annually to the Director on the effectiveness of the corrective action program. This report must be submitted on March 1 of each year until the corrective action program has been completed. This report may be submitted along with the annual ground water monitoring report. Each report must reference the titles and dates of any other periodic reports required by the permit or any updates to those reports but generally does not need to include duplicates of hard copies previously submitted. The annual reports must include, at a minimum, the analytical results required by Permit Conditions G.5, G.6, and G.9, and the results of the statistical analyses required by Permit Condition G.7.

(iii) Other Reports

The Permittee must comply with any other reporting requirements that become necessary under Permit Condition G.9 in accordance with the schedules covered by that permit condition and as required by OAC Rule 3745-54-77(C).

G.9. Integrated Ground Water Monitoring Program
OAC Rule 3745-54-101

- (a) The Permittee is required to establish and implement a ground water corrective action program under OAC Rule 3745-54-101 and must take corrective action, as necessary, to ensure that units/areas are in compliance with the GWRS as specified in Permit Condition G.2.
- (b) The Permittee must implement, as necessary, a corrective action program that prevents hazardous constituents specified in Permit Condition G.2(a) from exceeding their respective clean-up standards specified in Permit Condition G.2(a) at the compliance point specified in Permit Condition G.2(b), between the compliance point and the downgradient property boundary, and beyond the property boundary during the permit period specified in Permit Condition G.2(c) by removing the hazardous constituents or by treating them in place.
- (c) Site Characterization Reserved
- (d) The Permittee must establish and implement a ground water monitoring program to fully characterize the contaminated ground water as required by OAC Rule 3745-50-44(B)(8)(a) and to demonstrate the effectiveness of the corrective action program. Ground water monitoring must be effective in determining compliance with the GWRS in Permit Condition G.2 and in determining the success of any corrective action program in this Permit

Condition. The ground water monitoring program must include:

- (i) Installation and maintenance of a ground water monitoring system at the compliance point as defined in Permit Condition G.2(b), and, as necessary to protect human health and the environment, between the compliance point and the downgradient property boundary and beyond the property boundary. The ground water monitoring system must comply with the requirements in Permit Condition G.3.
- (ii) Collection, preservation, and analysis of samples pursuant to Permit Conditions G.4, G.5, and G.6. Statistical analysis must be conducted pursuant to Permit Condition G.7.
- (iii) The Permittee must conduct a sampling program semiannually for each chemical parameter and hazardous constituent specified in Permit Condition G.2(a) from each well (background and compliance) specified in Permit Condition G.3(b) during the permit period and any extensions due to corrective action implementation.

Any additional sampling shall be taken at an interval (frequency) that assures, to the greatest extent feasible, that an independent sample is obtained, by reference to the uppermost aquifer's effective porosity, hydraulic conductivity, hydraulic gradient, and the fate and transport characteristics of the potential contaminants.

- (iv) The Permittee shall compare the concentration of each hazardous constituent measured at each well at the compliance point specified in Condition G.2(b), between the compliance point and the downgradient facility boundary, and beyond the facility boundary, with its clean-up standard each time water quality is determined in accordance with procedures specified in Condition G.7.

Wells beyond the property boundary shall be sampled where necessary to protect human health and the environment, unless the Permittee demonstrates to the Agency that, despite the Permittee's best efforts, the Permittee was unable to obtain the necessary permission to undertake such action. The Permittee is not relieved of all responsibility to clean up a release that has migrated beyond the facility boundary where off-site access is denied. On-site measures to address such releases will be determined on a case-by-case basis.

- (v) The Permittee must maintain a record of ground water analytical data as measured and in a form necessary for the determination of statistical significance under Permit Conditions G.7 and G.8 for the permit period.

- (vi) The Permittee must determine the ground water flow rate and direction in the uppermost aquifer at least annually using the procedures specified in Section 3.1 of Appendix E-7 of the permit application.
- (vii) The Permittee shall analyze samples from all monitoring wells for all constituents contained in the Appendix to OAC Rule 3745-54-98 once every two years to determine whether additional hazardous constituents are present in the uppermost aquifer.
 - (a) If the Permittee finds additional constituents present (i.e., not listed in Permit Condition G.2(a) and above their PQL), the Permittee must, if desired, re-sample the affected well(s) within one month for the detected constituent(s) in the Appendix to OAC Rule 3745-54-98. If the results of the second analysis confirm the presence of new hazardous constituents, then their concentrations must be reported to the Director in writing within seven (7) days from completion of the second analysis. If the Permittee chooses not to re-sample, then the Permittee must report the concentrations of the additional constituents to the Agency within seven days after completion of the initial analysis. Additional corrective action measures may be required and the Permittee must comply with Permit Condition G.9(a).
 - (b) Within 90 days, the Permittee must submit to the Agency an application for a permit modification to incorporate the additional constituent(s) identified in Permit Condition G.9(c)(vii) into Permit Condition G.2(a). The application must include an identification of the concentration of each new Appendix to OAC Rule 3745-54-98 constituent detected above its PQL at the compliance point and/or at any well downgradient between the compliance point and the downgradient property boundary, a proposed clean-up standard for each new constituent under Permit Condition G.2(a), or a notice of intent to seek an alternate clean-up standard for a hazardous constituent.
 - (c) The Permittee must begin sampling/analyzing for the new constituents at the next regularly scheduled sampling event.
- (e) Response Action
 - (i) Based on the results of the Permittee's ground water monitoring program, the clean-up standards detailed in Permit Condition G.2(a) have been exceeded. Therefore, the Permittee must implement

corrective actions to remove or treat in place any hazardous constituents specified in Permit Condition G.2(a) that exceed their respective clean-up standards specified in Permit Condition G.2(a) in ground water within 180 days from the time the GWRS was exceeded.

- (ii) Corrective action measures required under Permit Condition G.9(e)(i) must be initiated and completed within a timeframe agreed upon with and approved by Ohio EPA.
- (iii) The Permittee must continue corrective action measures during the permit period to the extent necessary to ensure that the GWRS is not exceeded. If the Permittee is conducting corrective action at the end of the period, the Permittee must continue corrective action for as long as necessary to achieve compliance with the GWRS.

Once all clean-up standards listed in Permit Condition G.2(a) have not been exceeded for three consecutive years at any well in Permit Condition G.3(b) for any parameter listed in Permit Condition G.2(a), then the Permittee may submit a permit modification under OAC Rule 3745-50-51.

- (f) The Permittee must report in writing to the Director on the effectiveness of the corrective action ground water monitoring program annually according to Permit Condition G.8.
- (g) If the Permittee determines the corrective action program established by this permit no longer satisfies the requirements of OAC Rule 3745-54-101, the Permittee must, within ninety (90) days of that determination, submit an application for a permit modification per OAC Rule 3745-50-51 to make any appropriate changes to the program.