



John R. Kasich, Governor
Mary Taylor, Lt. Governor
Scott J. Nally, Director

CERTIFIED

September 4, 2013

Mr. John R. Jones
Vertellus Specialties, Inc.
201 North Illinois Street, Suite 1800
Indianapolis, IN 46204

**Re: Director's Final Findings and Orders
Vertellus Specialties, Inc.
EPA ID Number: OHD 083 320 945**

Dear Sir or Madam:

Transmitted herewith are Final Findings & Orders of the Director concerning the matter indicated.

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, made payable to "Treasurer, State of Ohio." 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

Sincerely,

Georgia Frakes, Management Analyst
Division of Materials and Waste Management

Enclosure: Director's Final Findings and Orders

cc: Ed Lim, DERR, CO
Todd Anderson, Legal
Harry Courtright, DMWM, NEDO
Ron Shadrach, NEDO



PUBLIC NOTICE RECORD

Notification Type: DIRECTOR'S FINAL FINDINGS AND ORDERS

Entity Info

Name: Vertellus Specialties, Inc.
Address: 201 North Illinois Street, Suite 1800
City/Township/Zip: Indianapolis, IN 46204 **County:** Cuyahoga
Description: Hazardous Waste

Notice Info

Weekly Review
 Public Notice
Date Of Action: 09/04/2013
Notification Number: 7707

Receiving Waters:

Meeting Details:

Standard Remark:

Other Remark:

On September 4, 2013, Ohio EPA issued a Director's Final Findings and Orders for Vertellus Specialties, Inc. for its facility located at 3201 Independence Road, Cleveland, Ohio 44105 in Cuyahoga County, EPA ID Number OHD083320945. The Orders require implementation of Corrective Measures which were selected through a Decision Document issued on December 16, 2010. This final action was not preceded by a proposed action and is appealable to the Environmental Review Appeals Commission.

OHIO E.P.A.

BEFORE THE

SEP -4 2013

OHIO ENVIRONMENTAL PROTECTION AGENCY

ENTERED DIRECTOR'S JOURNAL

In the Matter of:

The Former Reilly Tar and Chemical Corp.

Vertellus Specialties Inc.
201 North Illinois Street, Suite 1800
Indianapolis, IN

Respondent

DIRECTOR'S FINAL
FINDINGS AND ORDERS

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.

By: Jim J. Casar Date: 9-4-13

PREAMBLE

It is hereby agreed by and among the parties hereto as follows:

I. JURISDICTION

These Director's Final Findings and Orders (Orders) are issued to Vertellus Specialties Inc. (Respondent) pursuant to the authority vested in the director of the Ohio Environmental Protection Agency (Ohio EPA) under §§ 3734.13, 3734.20, 3745.01 and 6111.03 of the Ohio Revised Code (ORC).

II. PARTIES BOUND

These Orders shall apply to and be binding upon Respondent and successors in interest liable under Ohio law. No change in ownership relating to the Facility shall in any way alter Respondent's obligations under these Orders.

III. DEFINITIONS

Unless otherwise stated, all terms in these Orders shall have the same meaning as defined in Chapter 3734 and the rules promulgated there under. Whenever the terms listed below are used in these Orders or in any appendices, attached hereto and incorporated herein, the following definitions shall apply:

1. "Day" shall mean a calendar day.

2. "Facility" shall mean the site owned by Respondent located at 3201 Independence Road, Cleveland, Ohio, 44105, OHD 083 320 945, where the treatment, storage, and/or disposal of hazardous waste, and/or the discharge into waters of the state of industrial waste or other waste has occurred, including any other area where such hazardous wastes, industrial wastes, and/or any other wastes have migrated or threaten to migrate.
3. "Ohio EPA" shall mean the Ohio Environmental Protection Agency and its designated representatives.
4. "Parties" shall mean Respondent Vertellus Specialties Inc. and Ohio EPA.
5. "RCRA" shall mean the Resource Conservation and Recovery Act, 42 U.S.C. §6901 et seq. (1976), as amended.
6. "RCRA Corrective Measures Implementation" (CMI) shall mean the activities undertaken to implement the Site remedy identified in the Decision Document by Ohio EPA and any subsequent amendments.
7. "Release" shall mean any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping or disposing of hazardous waste or hazardous constituents into the environment.
8. "Work" shall mean any activities the Respondent is required to perform to comply with the requirements of these Orders and its Attachment(s) as described below.

IV. FINDINGS

All of the findings necessary for the issuance of these Orders pursuant to ORC §§ 3734.13, 3734.20, 6111.03 and 3745.01 have been made and are outlined below. Nothing in the findings shall be considered to be an admission by Respondent of any matter of law or fact. The Director of Ohio EPA has determined the following findings:

1. Respondent is a "person" as defined in ORC §§ 3734.01(G) and 6111.01(I), and Ohio Administrative Code (OAC) rule 3745-50-10(A).
2. Respondent is an Indiana corporation located at 201 North Illinois Street, Suite 1800, Indianapolis, Indiana.
3. Respondent currently owns the Facility located at 3201 Independence Road, Cleveland, Cuyahoga County, Ohio. The Facility is located on 12.19 acres and is surrounded by large industrial/commercial business with railroad and roadway

- right-of-way access points. The Facility was formerly a coal tar processing facility.
4. In 1987, Ohio EPA inspected and determined that the former owner/operator of the Facility, Reilly Industries, Inc., (Reilly) had established and operated a hazardous waste management unit on facility property. These activities subjected the facility to the permitting and closure standards in Chapters 3745-50, 54 and 55. The Facility did not have the required hazardous waste installation and operation permit for the storage of the hazardous waste. Reilly submitted a closure plan which was reviewed and approved by Ohio EPA in July 1988. Ohio EPA accepted the facility's closure certification report in October 1995.
 5. On December 29, 1981, Reilly filed a notification of hazardous waste activity with U.S. EPA pursuant to Section 3010 of RCRA.
 6. Facility property operations consisted of processing coal tar from neighboring steel facilities to produce various grades of coal tars, coal tar oils, and coal tar pitches that were later transported off-site to customers. This same basic operation was conducted at the facility property for over 60 years. The tar processing technology had not changed significantly during that time. The facility ceased all operations in 2000. Facility demolition was conducted during 2000 and 2001 under a demolition permit granted by the City of Cleveland. All former storage tanks, overhead piping, buildings, and other structures were removed from the facility property at that time.
 7. Under RCRA, the Corrective Action program was established to address threats to human health and the environment from historic or past waste management units and areas of concern at RCRA treatment, storage or disposal facilities. To address RCRA Corrective Action requirements at the facility, Respondent, on September 29, 2006, voluntarily agreed to work with Ohio EPA's Division of Hazardous Waste Management (DHWM) to address the site wide corrective action.
 8. November 2007, Respondent submitted the Phase I Assessment Report of the Corrective Action Measures Work Plan to Ohio EPA. Phase II was completed in December 2007 and Phase III activities were completed in July 2008. All three Phases of the Corrective Action Measures Work Plan involved site characterization and sampling.
 9. On September 30, 2009, Ohio EPA issued for public comment a Statement of Basis which set forth the proposed corrective measures for the Facility. The public notice appeared in the Cleveland Plain Dealer newspaper. Written comments were received from Respondent. A public meeting was not held.

10. Based on the information gathered and analyzed in the three Phases of the Corrective Action Measures Work Plan, Ohio EPA selected the corrective measures for the Facility in a Declaration and Decision Document, which described the selected corrective measures. The Declaration and Decision Document, Attachment A to these Orders, is incorporated into these Orders and is an enforceable part of these Orders.
11. The Declaration and Decision Document described a remedy which consisted of land use restrictions, including restrictions on excavation, through an environmental covenant, the installation of an isolation barrier which will eliminate worker exposures, fencing and vegetation management, monitoring well abandonment and continued downgradient monitoring well maintenance and periodic evaluation of ground water migration.
12. On January 25, 2012, Respondent entered into an environmental covenant with Ohio EPA, which covenant was recorded and became effective on January 30, 2012, satisfying one of the elements of the remedy. On May 10, 2012, Ohio EPA and Respondent amended that environmental covenant to incorporate a corrected legal description of the property.
13. Respondent's Facility is a hazardous waste facility, solid waste facility or other location where hazardous waste was treated, stored or disposed. There is or has been a release of hazardous waste or hazardous constituents into the soil and ground water from the Facility.
14. Constituents of concern were detected in the soil, dissolved in ground water and non-aqueous phase liquid was identified in the ground water.
15. Because of their quantity, concentration or physical or chemical characteristics, the Director determined that the organic chemicals treated, stored or disposed at the Facility are "hazardous wastes" as defined under Section 3734.01 of the Ohio Revised Code.
16. The ground water and surface water at the Facility are "waters of the state" as defined under Section 6111.01(H) of the Ohio Revised Code.
17. Conditions at the Facility may constitute a threat to public health or safety or are causing or contributing or threatening to cause or contribute to air or water pollution or soil contamination.
18. Respondent submitted a Corrective Action Remedies Construction and Operation & Maintenance Plan on October 7, 2010. Ohio EPA reviewed and approved the plan on December 15, 2010.

19. Ohio EPA has determined that, based on existing site data, industrial buildings located close to the Facility property boundary may be at risk of contamination from the Facility. A review of the buildings' use, and ground water data from 2007 and 2008, indicates that the offsite vapor intrusion pathway requires additional characterization. An examination of historic ground water data using a ground water modeling method indicates that the building in proximity to the northeast property corner and the structures to the east of the property need to be more closely evaluated to determine whether a complete pathway for vapor intrusion exists.

V. GENERAL PROVISIONS

Respondent shall perform the Work in accordance with these Orders, including but not limited to, the SOW(s), relevant guidance documents, and all standards, specifications, and schedules set forth in or developed pursuant to these Orders, as described below.

All activities undertaken by Respondent pursuant to these Orders shall be performed in accordance with the requirements of all applicable federal and state laws and regulations. Nothing in these Orders shall be construed as waiving or compromising in any way the applicability and enforcement of any other statutes or regulations applicable to Respondent's ownership or operation of the Facility.

Where any portion of the Work requires a permit or approval, the Respondent shall timely submit applications and take all other actions necessary to obtain such permits or approval. These Orders are not, and shall not be construed to be, a permit issued pursuant to any statute or regulation. Ohio EPA shall use its best efforts to promptly consider and decide upon permit applications which Respondent may be required to submit pursuant to the Work required to be performed under these Orders.

All Work performed pursuant to these Orders shall be under the direction and supervision of a contractor/project manager or an employee of Respondent with expertise in hazardous waste site investigation and remediation.

VI. ORDERS

Respondent shall achieve compliance with Chapter 3734. of the ORC and the regulations promulgated thereunder according to the following compliance schedule:

1. Within ninety (90) days after the effective date of these Orders, Respondent shall submit to Ohio EPA for its review and comment a Work Plan, including a schedule, for the CMI.
 - a. The CMI Work Plan shall provide for the design, construction and operation and maintenance of the remedy as set forth in the Declaration and Decision Document and shall be developed in conformance with the site-specific SOW listed in Attachment B, and the guidance documents listed in Attachment C to these Orders, attached hereto and incorporated herein, unless the Parties mutually agree otherwise. If Ohio EPA or Respondent determines that any additional or revised guidance documents in use by Ohio EPA or U.S. EPA after the effective dates of these Orders affect the Work to be performed in implementing the CMI, the Party discovering the new guidance shall notify the other in writing, and the affected documents shall be modified as appropriate.
 - b. Ohio EPA will review the CMI Work Plan and provide comments to Respondent. Within 30 days of receipt of Ohio EPA's comments on the CMI Work Plan, Respondent shall submit a new or revised CMI Work Plan that incorporates Ohio EPA's comments. 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 these Orders. 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.
 - c. Within 30 days after receiving approval of the CMI Work Plan, Respondent shall provide a third party, itemized cost estimate which outlines the tasks required to implement the corrective measure(s). Within 30 days of Ohio EPA approval of the cost estimate, Respondent shall provide financial assurance in the amount equal to the approved cost estimate. A financial assurance mechanism which meets the requirements of OAC rules 3745-55-47 through 3745-55-51 is sufficient to comply with this Order. Respondent may request in writing a reduction in the amount of financial assurance maintained, at any time that the amount maintained is greater than the estimated costs of completing the corrective measures. Upon receipt of prior written approval by Ohio EPA, Respondent may reduce the amount of financial assurance maintained so that the amount is equal to the estimated costs of completing the corrective measures.
2. Within ninety (90) days of the effective date of these Orders, Respondent shall submit to Ohio EPA a health and safety plan developed in conformance with the guidance documents listed in Attachment C.

3. Should Respondent identify any inconsistency between any of the laws and regulations and guidance documents which they are required to follow by these Orders, Respondent shall promptly notify Ohio EPA in writing of each inconsistency and the effect of the inconsistencies upon the Work to be performed. Respondent shall also recommend, along with a supportable rationale justifying each recommendation, the requirement Respondent believes should be followed. Respondent shall implement the affected Work as directed by Ohio EPA.
4. Within ninety (90) days after the effective date of these Orders, Respondent shall submit to Ohio EPA for its review and comment a Work Plan, including a schedule, for the Vapor Intrusion Investigation.
 - a. The Vapor Intrusion Investigation Work Plan shall provide for collection of current ground water monitoring data and a combination of soil gas monitoring offsite, and on site as applicable, offsite sub slab soil gas investigations and/or indoor real time air monitoring data in adjacent buildings. The principal constituents of concern were identified to be benzene and naphthalene. Analyses shall be conducted by approved USEPA methodology for volatile organics including naphthalene. The Vapor Intrusion Investigation Work Plan shall be developed in conformance with the guidance documents listed in Attachment C to these Orders, attached hereto and incorporated herein, unless the Parties mutually agree otherwise. If Ohio EPA or Respondent determines that any additional or revised guidance documents in use by Ohio EPA or U.S. EPA after the effective dates of these Orders affect the Work to be performed in implementing the Vapor Intrusion Investigation Work Plan, the Party discovering the new guidance shall notify the other in writing, and the affected documents shall be modified as appropriate.
 - b. Ohio EPA will review the Vapor Intrusion Investigation Work Plan and shall approve or modify and approve the Vapor Intrusion Investigation Work Plan or provide comments to Respondent. Within 30 days of receipt of Ohio EPA's comments on the Vapor Intrusion Investigation Work Plan, Respondent shall submit a new or revised Vapor Intrusion Investigation Work Plan that incorporates Ohio EPA's comments. Ohio EPA shall approve or modify and approve, in writing, the amended or new Vapor Intrusion Investigation Work Plan. The Vapor Intrusion Investigation Work Plan, as approved or as modified and approved, shall be incorporated in and made an enforceable part of these Orders. The approved Vapor Intrusion Investigation Work Plan shall be implemented in accordance with the terms, conditions and schedules contained therein. Subsequent changes to the approved Vapor Intrusion Investigation Work Plan must be authorized by Ohio EPA.

- c. Within sixty (60) days upon completion of the Vapor Intrusion Investigation, Respondent shall submit to Ohio EPA a report of the Investigation findings. The report may include proposals for additional remedial action or corrective measures to address any vapor intrusion pathway identified.

5. Additional Work

- a. 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 these Orders as set forth in this Section of these Orders.

- b. Within 30 days after receipt of written notice from Ohio EPA that additional work is necessary, Respondent 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 these Orders. Upon approval of the work plan by Ohio EPA, Respondent shall implement the work plan for additional work in accordance with the schedules contained therein.

6. Respondent shall provide a copy of these Orders to all contractors, subcontractors, laboratories and consultants retained to perform any portion of the work pursuant to these Orders. Respondent shall ensure that all contractors, subcontractors, laboratories and consultants retained to perform work pursuant to these Orders comply with the provisions of these Orders.
7. For the duration of these Orders, Respondents shall use reasonable best efforts to assure that no portion of the Facility will be used in any manner which would adversely affect the integrity of any corrective measures, including monitoring systems, at the Facility. Respondent shall promptly notify Ohio EPA by registered mail of any conveyance of any interest in real property which is known to comprise the Facility of which it has actual knowledge. Respondent's notice shall include the name and address of the grantee and a description of the provisions made for continued maintenance of containment and monitoring systems. In no event shall the conveyance of any interest in the property that includes, or is a portion of, the Facility, release or otherwise affect the liability of Respondent to comply with these Orders.

VII. TERMINATION

Respondent's obligations under these Orders shall terminate when Respondent certifies in writing and demonstrates to the satisfaction of Ohio EPA that the Respondent has performed all of its obligations under these Orders and Ohio EPA's Division of Environmental Response and Revitalization acknowledges, in writing, the

termination of these Orders relative to the Respondent. If Ohio EPA does not agree that all obligations have been performed, then Ohio EPA will notify Respondent of the obligations that have not been performed, in which case Respondent shall have an opportunity to address any such deficiencies and seek termination as described above.

The certification shall contain the following attestation: "I certify that the information contained in or accompanying this certification is true, accurate and complete."

This certification shall be submitted by Respondent to Ohio EPA and shall be signed by a responsible official of the Respondent. For purposes of these Orders, a responsible official is a corporate officer who is in charge of a principal business function of Respondent. The termination of these Orders shall not affect the terms and conditions of Section VIII, Other Claims, Section XV, Reservation of Rights, Section XVI, Indemnity, and Section XIX, Waiver and Agreement.

VIII. OTHER CLAIMS

Nothing in these Orders shall constitute or be construed as a release from any claim, cause of action or demand in law or equity against any person, firm, partnership or corporation, not a party to these Orders, for any liability arising from, or related to, the operation of Respondent or of the Facility.

IX. OTHER APPLICABLE LAWS

All actions required to be taken pursuant to these Orders shall be undertaken in accordance with the requirements of all applicable local, state and federal laws and regulations. These Orders do not waive or compromise the applicability and enforcement of any other statutes or regulations applicable to Respondent.

X. MODIFICATIONS

These Orders may be modified by agreement of the parties hereto. Modifications shall be in writing and shall be effective on the date entered in the journal of the Director of Ohio EPA.

XI. NOTICE

All documents required to be submitted by Respondent pursuant to these Orders shall be addressed to:

Ohio Environmental Protection Agency
Northeast District Office
Division of Environmental Response and Revitalization

2110 East Aurora Road
Twinsburg, Ohio 44087
Attn: DERR Site Coordinator, Former Reilly Tar and Chemical Corp.

and Ohio EPA Central Office at the following addresses:

For mailings, use the post office box number:

Scott J. Nally, Director
Ohio Environmental Protection Agency
Lazarus Government Center
Division of Environmental Response and Revitalization
P.O. Box 1049
Columbus, Ohio 43216-1049
Attn: Manager, DERR Engineering Section

For deliveries to the building:

Scott J. Nally, Director
Ohio Environmental Protection Agency
Lazarus Government Center
Division of Environmental Response and Revitalization
50 West Town Street
Columbus, Ohio 43215
Attn: Manager, DERR Engineering Section

or to such persons and addresses as may hereafter be otherwise specified in writing by Ohio EPA.

Any report or other document submitted by Respondent pursuant to these Orders, which make any representation concerning such Respondent's compliance or noncompliance with any requirement of these Orders, shall be signed and certified by a responsible official of the Respondent in accordance with OAC rule 3745-50-58(K). For purposes of these Orders, a responsible official is a corporate officer who is in charge of a principal business function of Respondent, or a duly authorized representative.

XII. ACCESS

1. Ohio EPA and Respondent shall have access at all times to the Facility and any other property to which access is required for the implementation of these Orders, to the extent access to the property is controlled by Respondent. Access under these Orders shall be for the purposes of conducting any activity related to these Orders including, but not limited to, the following:

- a. Performing the Work;
 - b. Monitoring the Work;
 - a. Inspecting and copying records, and/or other documents related to the implementation of these Orders;
 - d. Conducting sampling, investigations and/or tests related to the implementation of these Orders; and
 - e. Verifying any data and/or other information submitted to Ohio EPA.
2. Notwithstanding any provision of these Orders, the State of Ohio retains all of its access rights and authorities, including enforcement authorities related thereto, under any applicable statute or regulations.
3. To the extent that any property to which access is required for the implementation of these Orders is owned or controlled by persons other than Respondent, Respondent shall use its best efforts to secure from such persons access for Respondents and the Ohio EPA as necessary to effectuate these Orders. Copies of all access agreements obtained by Respondent shall be provided promptly to Ohio EPA.

XV. RESERVATION OF RIGHTS

Ohio EPA and Respondent each reserve all rights, privileges and causes of action, except as specifically waived in Section XIX of these Orders.

XVI. INDEMNITY

Respondent shall indemnify, save, and hold harmless Ohio EPA from any and all claims or causes of action arising from, or related to, events or conditions at the Facility for which Respondent is liable. Ohio EPA shall provide notice to Respondent within thirty (30) days of receipt of any claim which may be the subject of indemnity as provided in this Section, and to cooperate with Respondent in the defense of any such claim or action against Ohio EPA. Ohio EPA shall not be considered a party to and shall not be held liable under any contract entered into by Respondent in carrying out the activities pursuant to these Orders. Consistent with federal, state and common law, nothing in these Orders shall render Respondent liable to indemnify Ohio EPA for any tortious conduct of Ohio EPA occurring outside of Ohio EPA's exercise of its discretionary functions. Discretionary functions of Ohio EPA include, but are not limited to, Ohio EPA's review, approval or disapproval of Work performed pursuant to these Orders.

Respondents and Ohio EPA will cooperate in the defense of any claim or action against Ohio EPA which may be subject to this indemnity.

XVII. UNAVOIDABLE DELAY

Respondent shall cause all Work to be performed in accordance with applicable schedules and time frames unless any such performance is prevented or delayed by an event which constitutes an unavoidable delay. For purposes of these Orders, an unavoidable delay shall mean an event beyond the control of Respondent which prevents or delays performance of any obligation required by these Orders and which could not be overcome by due diligence on the part of Respondent. Increased cost of compliance shall not be considered an event beyond the control of Respondent.

Respondent shall notify Ohio EPA in writing within five (5) days after the occurrence of an event which Respondent contends is an unavoidable delay. Such written notification shall describe the anticipated length of the delay, the cause or causes of the delay, the measures taken and to be taken by Respondent to minimize the delay, and the timetable under which these measures will be implemented. Respondent shall have the burden of demonstrating that the event constitutes an unavoidable delay.

If Ohio EPA does not agree that the delay has been caused by an unavoidable delay, Ohio EPA will notify Respondent in writing. Ohio EPA reserves the right to terminate these Orders, perform any additional remediation and/or enforce the terms of these Orders in the event that Ohio EPA determines that the delay has not been caused by an unavoidable delay. If Ohio EPA agrees that the delay is attributable to an unavoidable delay, Ohio EPA will notify Respondent in writing of the length of the extension for the performance of the obligations affected by the unavoidable delay.

XVIII. EFFECTIVE DATE

The effective date of these Orders shall be the date on which the Orders are entered in the Journal of the Director of Ohio EPA.

XIX. WAIVER AND AGREEMENT

In order to resolve disputed claims, without admission of fact, violation, or liability, Respondent agrees that these Orders are lawful and reasonable, and agrees to perform all actions in accordance with or as required by these Orders. Respondent consents to and agrees not to contest Ohio EPA's jurisdiction to issue and enforce these Orders,

Respondent hereby waives the right to appeal the issuance, terms and conditions, and service of these Orders and hereby waives any and all rights that it may

have to seek administrative or judicial review of the issuance, terms and conditions, and service of these Orders in law or equity.

Notwithstanding the limitations herein on Respondent's right to appeal or seek administrative or judicial review, Ohio EPA and Respondent agree that in the event that these Orders are appealed by any other third party to the Environmental Review Appeals Commission, or any court, Respondent retains the right to intervene and participate in such appeal. In such event, Respondent shall continue to comply with these Orders notwithstanding such appeal and intervention unless these Orders are stayed, vacated or modified.

XX. SIGNATORY AUTHORITY

Each undersigned representative of a party to these Orders certifies that he or she is fully authorized to enter into these Orders and to legally bind such party to these Orders.

IT IS SO ORDERED AND AGREED:

Ohio Environmental Protection Agency



Scott J. Nally, Director

September 4, 2013
Date

IT IS SO AGREED:

Vertellus Specialties Inc.:



Signature

Aug 12, 2013
Date

John R. Jones
Printed or Typed Name

Director of Regulatory Management
Title

ATTACHMENT A

OHIO E.P.A.

DEC 16 2010

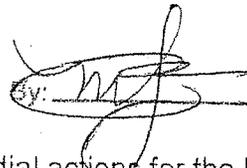
DECLARATION

SITE NAME AND LOCATION

Vertellus Specialties, Inc.
3201 Independence Road
Cleveland, Ohio (Cuyahoga County)

ENTERED DIRECTOR'S JOURNAL

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.

By: 

Date: 12.16.2010

STATEMENT OF BASIS AND PURPOSE

This Decision Document presents the selected remedial actions for the Former Reilly Tar and Chemical Corporation Facility site in accordance with the policies of the Ohio Environmental Protection Agency and the statutes and regulations of the State of Ohio.

ASSESSMENT OF THE SITE

The Former Reilly Tar and Chemical Facility site is located on 11.8 acres at 3201 Independence Road, Cleveland, Ohio. Reilly Tar began operations in 1937 processing coal tar from neighboring steel facilities to produce various grades of tars, oils and pitches that were later transported off-site to customers. The facility ceased all operations in 2000. Reilly Tar and Chemical Corporation changed its name in 1989 to Reilly Industries, Inc. In 2006, Reilly Industries, Inc. changed its name to Vertellus Specialties, Inc., after a merger with Rutherford Chemicals.

Under Ohio EPA's direction, Vertellus Specialties, Inc. (Vertellus) conducted a site investigation to characterize the nature, extent and migration rate of potential hazardous constituent releases from the facility. Surface soils were presumed by Vertellus to have polynuclear aromatic hydrocarbon (PAH) contamination from past facility activities. Surface samples were collected to verify this assumption. Vertellus proceeded under the presumption that an isolation barrier would be needed to prevent direct contact with surface soil facility-wide.

Subsurface and ground water sampling was completed to determine the impact, nature, extent and migration rate of potential hazardous constituent releases from the facility. The soils and ground water were found to contain monocyclic and polycyclic aromatic hydrocarbons and a few metals (notably arsenic and mercury in soils and arsenic, barium, nickel and tin in the ground water).

Upon assessment of the sampling results, Ohio EPA concludes that exposure to the contaminants present in their unmitigated form are at levels that may be unacceptable for the typical future outdoor worker, the on-site construction worker and the indoor worker. The potential risks for the outdoor and construction workers are based on incidental ingestion and dermal contact with potentially carcinogenic PAHs in soil. The potential risk for the future indoor worker is based on inhalation of benzene (vapor intrusion from ground

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water). The direct contact exposure pathway for ground water via human consumption, however, is incomplete because of the "Urban Setting" designation for the area and ground water is not used for any purpose. Finally, modeling showed no constituents were identified as having the potential to migrate from ground water to the surface water of the Cuyahoga River at concentrations exceeding applicable human health or aquatic life water quality criteria.

DESCRIPTION OF THE SELECTED REMEDIES

The selected remedies will include:

- Land use restrictions
 - Prohibit the use of the shallow ground water across the entire facility
 - limit any use other than industrial operations;
 - prohibit any disturbance of or below the two foot isolation barrier with the exception of monitoring or remediation activities or utility work and
 - prohibit placement of any type of structure (mobile or permanent) above the isolation barrier that does not also have satisfactory protective controls addressing potential vapor intrusion, including controls preventing vapor migration along any installed utilities.
- Isolation barrier
 - Eliminate worker exposures
 - Restrictions on excavation
 - Fencing and vegetation management plan
 - Installation of a cover
 - Maintaining a cover
 - Monitoring well abandonment
- Down-gradient monitoring well maintenance and periodic evaluation of ground water migration
- Financial assurance instrument maintenance to cover all associated costs of the site, including design, installation and maintenance of the isolation barrier.

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STATUTORY DETERMINATIONS

Today's selection and required implementation of remedial actions is protective of human health and the environment, is in accordance with applicable State and federal laws and is responsive to public participation and input. The remedies utilize permanent solutions, to the maximum extent practicable, to reduce the toxicity, mobility and volume of hazardous substances at the Former Reilly Tar and Chemical Corporation Facility. The effectiveness of the remedies will be reviewed regularly.



Chris Korleski
Director

12/14/10
Date

OHIO EPA DMM

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Decision Document for the Remediation of the
Former Reilly Tar and Chemical Corporation Facility
3201 Independence Road, Cleveland, Ohio
(Cuyahoga County)
OHD 083 320 945

Prepared By
The Ohio Environmental Protection Agency
November, 2010

DEC 16 2010

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1.0 INTRODUCTION

1.1 Executive Summary

The Ohio Environmental Protection Agency (Ohio EPA) has prepared this Decision Document for the remediation of the Former Reilly Tar and Chemical Corporation Facility (Reilly Tar) site in Cleveland, Ohio. This Decision Document identifies Ohio EPA's selected remedies and explains the reasons for the selection of the remedies.

Under the Resource Conservation and Recovery Act (RCRA), the Corrective Action program was created to address threats to human health and the environment from historic or past waste management areas at RCRA treatment, storage or disposal facilities. The Reilly Tar property (currently owned by Vertellus Specialties, Inc.) is subject to RCRA Corrective Action requirements because Reilly Tar established and operated a hazardous waste management unit on facility property. This unit was an unpermitted storage unit. Reilly Tar submitted a closure plan to Ohio EPA in July 1988 for the unpermitted storage area. Closure completion was certified by Ohio EPA in October 1995.

To address the corrective action requirements, Vertellus Specialties, Inc. (Vertellus) voluntarily agreed to work with Ohio EPA's Division of Hazardous Waste Management (DHWM), and has conducted extensive soil and ground water sampling at the facility. A summary of the facility investigation is discussed in Section 3.

Ohio EPA reviewed Vertellus' submittals that document the results of the facility investigation and previously available information and has selected remedies to remediate the site. The evaluation criteria Ohio EPA used in selecting the remedies are discussed in Section 4.

In brief, the corrective measures for the Reilly Tar site include providing an isolation barrier two feet thick over the facility property, an operation and maintenance plan for the barrier, ground water monitoring in down gradient wells, ground water monitoring well abandonment, and facility property use restrictions. A summary of Ohio EPA's selected remedies is discussed in Section 5. Ohio EPA finds that these remedies will further protect public health and the environment by permanently reducing risks to acceptable levels once the remedies are implemented.

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1.2 How the Corrective Action Process Works

The initial step in the corrective action process for facilities regulated under RCRA is site characterization or investigation to define the nature and extent of contamination at the facility. The information collected supports the selection and implementation of a remedy or remedies. This step culminates with the facility's submission of a report summarizing the investigation data. Vertellus has completed an investigation and submitted a report to Ohio EPA for review.

In the next step of the corrective action process, Ohio EPA generates a Statement of Basis which summarizes the Agency's preferred remedies for the facility. This document is then made available to the public for review and comment. Ohio EPA issued the Statement of Basis for the Former Reilly Tar and Chemical Corporation Facility site on September 29, 2009, commencing a 45-day public comment period. Copies of the Statement of Basis were made available to the public at the Ohio EPA - Northeast District Office, 2110 East Aurora Road, Twinsburg, Ohio and, Ohio EPA, Division of Hazardous Waste Management, 50 West Town Street, Suite 700, Columbus, Ohio. Ohio EPA received comments during the comment period and a responsiveness summary has been prepared as an attachment to this document.

After considering all comments received during the public comment period, Ohio EPA then issues a Decision Document. This document meets that purpose and is the Decision Document for the Former Reilly Tar and Chemical Corporation Facility site in Cleveland, Ohio.

2.0 SITE HISTORY

The Former Reilly Tar and Chemical Corporation Facility site is located on 11.8 acres at 3201 Independence Road, Cleveland, Ohio. Reilly Tar purchased the property in 1936 and for the next 60 years facility operations consisted of processing coal tar from neighboring steel facilities to produce various grades of tars, oils and pitches that were later transported off-site to customers. The facility ceased all operations in 2000. Facility demolition was conducted in 2000 and 2001 under a demolition permit granted by the City of Cleveland. All former storage tanks, overhead piping, buildings and other structures were removed from the facility property at that time. The facility property is currently owned by Vertellus Specialties Inc¹, and is vacant and unoccupied.

¹ Reilly Tar and Chemical Corporation changed its name in 1989 to Reilly Industries, Inc.. In 2006, Reilly Industries, Inc. changed its name to Vertellus Specialties, Inc, after a merger with Rutherford Chemicals.

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On September 5, 2006, Ohio EPA notified Vertellus that the former Reilly Tar and Chemical Corporation Facility property is subject to RCRA corrective action requirements. This was based on an Ohio EPA file review which determined that Reilly Industries, Inc. established and operated a hazardous waste management unit on facility property. This unit was an unpermitted storage unit. Reilly Tar submitted a closure plan to Ohio EPA in July 1988 for the unpermitted storage area. Closure completion was certified by Ohio EPA in October 1995.

3.0 SUMMARY OF THE FACILITY ASSESSMENT

Under Ohio EPA's direction, Vertellus conducted a site investigation to characterize the nature, extent and migration rate of potential hazardous constituent releases from the facility.

Surface soils were presumed by Vertellus to have polynuclear aromatic hydrocarbon (PAH) contamination from past facility activities. Surface samples were collected to verify this assumption. Vertellus proceeded under the presumption that an isolation barrier would be needed to prevent direct contact with surface soil facility property wide.

Subsurface and ground water sampling was completed during three field work phases to determine the impact, nature, extent and migration rate of potential hazardous constituent releases from the facility. The sampling was conducted on-site as well as off-site.

- **Phase I** – Phase I focused on determining whether there had been an impact on subsurface soils and/or ground water from historical operations, and if so, whether those impacts had adversely affected off-site ground water or the nearby Cuyahoga River. Phase I consisted of installing four ground water monitoring wells, collecting subsurface soil samples, collecting ground water samples from the newly installed wells, and determining groundwater flow direction. Results from the assessment presented in Vertellus' report dated November 2007 identified non-aqueous phase liquid (NAPL) in one on-site well (MW-2), dissolved constituents of concern (COC) in two of the four newly installed monitoring wells, and dark staining of soil in the unsaturated and saturated borings completed in the central portions of the property. Since Reilly Tar processed a wide variety of tar products, staining and odors were referred to as coal tar distillate (CTD). Given this information and the need to further characterize the extent of ground water conditions found in Phase I, Phase II was developed and implemented with Ohio EPA's approval.

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• **Phase II** – Phase II was performed in December 2007 to fill the data gaps identified during Phase I including: i) collecting physical and analytical soil information needed to complete a health-based risk assessment; ii) determining whether CTD was present in soils in other portions of the property; and iii) determining if the downgradient ground water impacts had or were likely to result in an unacceptable risk to off-site groundwater receptors. Phase II resulted in collecting five additional surface soil samples for the risk assessment, installing five additional wells, and sampling all of the existing and newly installed wells for COC. Phase II results culminated in Ohio EPA's acknowledgement that on-site ground water conditions had been adequately assessed, and that surface soil and ground water analytical results were suitable for use in a health-based risk assessment. Observations of CTD in on-site soils were consistent with past facility property operations and were not regarded as a concern. However, Ohio EPA asked Vertellus to assess off-site soils and ground water to the east (on the Heidtman property) to demonstrate whether: i) the presence of CTD in soils diminished off-site; ii) NAPL identified in MW-2 was present off-site; and iii) the levels of dissolved COC observed in on-site wells dropped in the off-site down gradient wells. A work plan was developed and agreed to by Ohio EPA that targeted an off-site area to the east (Phase III).

• **Phase III** – Phase III activities in July 2008 included completing three off-site soil borings to determine the depth of ground water, recording soil conditions as the borings were advanced, assessing the absence or presence of CTD, installing / developing / sampling all temporary wells, and noting the absence or presence of NAPL before the wells were abandoned. The three off-site wells were positioned to provide an off-site "mate" to MW-2, MW-3 and MW-6. Field observations did not identify significant impact from CTD in the down gradient direction. Furthermore, analytical results from the ground water samples were successful in demonstrating that dissolved COC decreased in concentrations from the facility property boundary to off-site locations. Combined, this information suggests there is little to no risk to off-site ecological or human receptors.

Sampling data can be found in the RCRA Corrective Action Investigation Final Report.

3.1 Site Wide Ground Water

Ground water level measurements were recorded between each phase of work to ensure that well screens were designed to cross the water table. Between Phase I and Phase II, water levels were recorded in all four wells three times. Between Phases II and III, water levels in wells were recorded up to 6 times in all nine wells. Given the number of water elevation measurements during separate seasons, trends were noted

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at each well and between wells to develop ground water contours, ground water flow direction and ground water gradients.

Based on the information collected during the assessment, depth to ground water ranged from 7 to 20-feet below grade and mimics topography by flowing in a north/northeasterly direction. Ground water flows from upgradient well MW-1 towards wells MW-3, MW-4 and MW-6. Hydraulic gradients vary across the facility property.

For example, in the southern portion of the facility property, the hydraulic gradient between wells MW-1 and MW-5 is very shallow with a gradient of 0.005 feet per foot. In the central portion of the facility property, the gradient generally increases from 0.020 to 0.060-feet per foot. In the northeastern portion of the facility property near TW-3, ground water gradient slightly increases to 0.070 to 0.080 feet per foot. The full hydrogeological facility property setting is detailed in the RCRA Corrective Action Investigation Final Report.

Geologically, the Reilly Tar property is located within the Eastern Lake Section of the Central Lowland Province, near the north end of the Appalachian Plateaus Province, locally within the Cuyahoga River valley physiographic unit. The Cuyahoga River valley is a pre-glacial valley deeply cut into the underlying bedrock. During the period of glacial advance, the Cuyahoga River valley widened, and was ultimately filled in with several hundred feet of glacial till, lacustrine and alluvium (river laid sediments). The alternating layers of glacial till and lacustrine material within the pre-glacial valley were deposited mainly during the Wisconsin Glacial Episode. A layer of glacial till (unstratified clay) was deposited across this area with each advance of the ice sheet and during each recession of the glacier, lacustrine sediments (sand, silt and clay) were laid over the till.

After departure of the glacier, fluvial deltas made up of sand, silt and gravel were formed over the remaining glacial sediments from the post-glacial lakes. Alluvium, or river-laid sediments (mainly sand), was deposited by the river. The base of the pre-glacial valley lies near or directly beneath the facility property. The Cuyahoga River lies generally west of the former pre-glacial river valley.

To gain a better understanding of the local geology affecting the occurrence of ground water and the flow direction of ground water, local records were researched. Records review identified 28 soil boring logs (1,500 to 2,000 feet north of the facility property at ground elevations 570 to 590 feet above mean sea level [MSL]) from borings drilled and sampled through the Cuyahoga River valley sediments to depths of 240 to 340 feet below grade. These logs recorded fluvial-delta deposits and alluvium

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sediments consisting of sand, gravel and silt along with fill material from ground surface to a depth of approximately 30 feet below grade.

Below this layer was a uniform thickness of soft to very stiff unsorted glacial till extending to a depth of approximately 40 to 65 feet. Beneath the glacial till was a layer of soft, stratified lacustrine clays with thicknesses ranging from approximately 10 to 15 feet. Underlying the lacustrine clays are continuous layers of till and other lacustrine sediments with thicknesses ranging from 190 to 260 feet down to the bedrock surface (elevation 325 to 270 feet MSL).

Logs from borings nearest the facility property along the western banks of the Cuyahoga River encountered bedrock believed to be consistent with the old river valley walls because bedrock depths became shallower west and northwest of the facility property. The base of the post-glacial valley has been mapped a short distance east of the current river location and is oriented in a north/northeasterly direction and appears to be directly beneath the facility property.

Bedrock underlying the facility property is estimated to be approximately 400 feet below grade (elevation 240 feet MSL). Bedrock would be expected to consist of the Lower Mississippian Bedford Shale and the Devonian Cleveland and Chagrin Members of the Ohio Shale. Shale units typically are very dense and have low groundwater yields ranging from 0 to 5 gallons per minute (gpm). In comparison, wells installed in the Cuyahoga River valley sand and gravel units have yields ranging from 100 to 300 gpm.

3.1.1 Site Wide Ground Water Evaluation Criteria

The highest detected levels on-site showed that coal tar distillate (CTD) was detected in some monitoring wells. These wells were located on-site. The sample from MW-2 was mainly a coal tar distillate and was analyzed as a waste dilution. Down gradient monitoring wells showed COC levels that were protective of an industrial scenario in the risk assessment. Sampling data can be found in the RCRA Corrective Action Investigation Final Report.

A summary of facility risk based on the data is included in Section 3.3.

3.2 Site Wide Soil

Soil borings were completed on-site and off-site that encountered fill materials and native soils. Soil boring logs show fill material consisting of reworked sands mixed with

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rock, brick, wood and slag fragments ranging in thickness from 2 to 14 feet below grade on-site and 6 to 8 feet below grade off-site. Native soils were characterized as fine to coarse grained, well sorted sand with varying densities having silt concentrations from approximately 5 to 20 percent between borehole locations. Based on research of the regional geology/hydrogeology, native soil encountered would be considered part of the fluvial-delta deposits and could extend to a depth of approximately 100 feet below grade.

During the three phases of assessment, no bedrock or aquitards (e.g. clays) were encountered in any of the soil borings completed to the depth of 30 feet. Saturated soils were encountered at depths ranging from 4 to 18.7 feet below grade. Fill and native soil in the central and northeastern portions of the facility property contained staining, defined as coal tar distillate (CTD), CTD odors, or when CTD was present in the liquid phase, the material was referred to as product/NAPL. The lateral extent of the CTD on the eastern portion of the facility property appears to be aligned from south to north between MW-9, SB-9, MW-2, MW-6 and the nearby soil boring SB-4 where CTD odor, staining and/or NAPL was observed during completion of the soil borings or wells. East of the property boundary on the Heidtman property, borings TW-1 and TW-2 contained either CTD staining or odors. In the central portion of the facility property, from south to north, SB-6, MW-5 and SB-3 contained CTD odors and/or NAPL. On the western side of the property, from south to north, CTD staining, odors, and/or NAPL were observed in SB-7, SB-5 and SB-2.

By contrast, the southern (upgradient) and northern (downgradient) soil borings and monitoring well locations were generally clean and no CTD staining or NAPL were observed. In the southern (upgradient) portion of the facility property, soil borings and/or well locations that did not exhibit CTD staining or odor are SB-11, SB-20, MW-1, SB-10, SB-19 and SB-8. On the northern (down gradient) portion of the facility property MW-3, SB-1, SB-17, MW-4 and MW-7 did not contain CTD staining or NAPL.

In general, the CTD was observed in unsaturated fill and native sands, and saturated intervals within the borings on the elevated, western portion of the facility property, near Independence Road, and within saturated native sands in other borings located in the central portion of the facility property.

3.2.1 Soil Evaluation Criteria

Contaminant levels in samples of surface soil are above risk-based levels for direct contact by future workers. Compounds with elevated levels include: benzene,

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ethylbenzene, styrene, toluene, total xylenes, acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, dibenzofuran, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, 1-methylnaphthalene, 2-methylnaphthalene, phenanthrene, pyrene, naphthalene, arsenic and mercury.

Levels of tar related compounds were found in subsurface soils above risk-based levels for some exposure pathways. Compounds with elevated levels include: benzene, ethylbenzene, styrene, toluene, total xylenes, acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, dibenzofuran, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, 1-methylnaphthalene, 2-methylnaphthalene, phenanthrene, pyrene, naphthalene, arsenic and mercury.

Sampling data can be found in the RCRA Corrective Action Investigation Final Report.

3.3 Summary of Facility Risk

The human health and ecological risk assessment was performed using site-specific analytical information compiled during Phase I and Phase II of the assessments. All work was conducted in a manner consistent with standards and customary approaches specified by Ohio EPA's Division of Hazardous Waste Management (DHWM) under RCRA, as well as standard and customary U.S. EPA approaches as needed. The purpose of the risk assessment was to provide quantitative analyses, in a conservative manner; of the likelihood that adverse health effects may be associated with potential exposures to constituents in the environmental media associated with past facility property operations. In providing health-related information on potential human contact with facility property-associated constituents, this risk assessment was designed to provide a sound basis for risk management decisions.

All of the analytical results from soil samples collected during Phase I and II were used to identify COC that were compared to Ohio EPA screening values. Benzene, ethylbenzene, styrene, toluene, total xylenes, acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, dibenzofuran, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, 1-methylnaphthalene, 2-methylnaphthalene, phenanthrene, pyrene, naphthalene, arsenic and mercury were identified as COC for direct contact with soil.

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Although ground water is not used for drinking, COC for groundwater were identified as benzene, ethylbenzene, toluene, total xylenes, acenaphthene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzofuran, fluoranthene, fluorene, 1-methylnaphthalene, 2-methylnaphthalene, phenanthrene, pyrene, naphthalene, arsenic, barium, nickel, tin, cyanide and sulfide. NAPL was encountered in two on-site monitoring wells. COC for potential vapor intrusion from ground water into indoor air of future buildings at the facility property consisted of benzene, toluene, 1-methylnaphthalene, 2-methylnaphthalene and naphthalene.

Based on ground water flow modeling, there were no COC identified as having the potential to migrate from ground water to surface water of the Cuyahoga River at concentrations exceeding applicable human health or aquatic life water quality criteria.

The levels of COC in soil and ground water varied across the site. The highest detected levels on site showed that CTD was detected in some monitoring wells. These wells were located on-site. The sample from MW-2 was mainly a coal tar distillate and was analyzed as a waste dilution. Down gradient monitoring wells showed COC levels that were protective of an industrial scenario in the risk assessment. Sampling data can be found in the RCRA Corrective Action Investigation Final Report.

The human receptors evaluated in the assessment consist of future outdoor workers, future indoor workers and future construction workers. The outdoor workers were assessed for incidental ingestion and dermal contact with surface soil, and inhalation of volatile emissions and airborne particulates associated with wind erosion. The construction workers were evaluated for these same exposure routes for potential exposure to COC in both surface and subsurface soil. The indoor workers were assessed for inhalation of volatile emissions in indoor air (vapor intrusion)

The results of the analyses indicate that the potential noncancerous hazard indices in the unmitigated condition for the future outdoor and indoor workers are above the target benchmark of 1. A hazard index of 1 is established by Ohio EPA. For the future construction worker, the cumulative hazard index is below 1. The hazard index for the outdoor worker is driven by inhalation of naphthalene in outdoor air (volatilizing from soil). For the future indoor worker, the hazard index is driven by inhalation of benzene and naphthalene (vapor intrusion from ground water).

The cumulative potential cancer risks in the unmitigated condition exceed Ohio EPA's potential risk benchmark of 1×10^{-5} for future outdoor and indoor industrial and construction workers. The potential excess lifetime cancer risks for the outdoor and

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construction workers are based on incidental ingestion and dermal contact with potentially carcinogenic polynuclear aromatic hydrocarbons in soil. The potential excess lifetime cancer risk for the future indoor worker is based on inhalation of benzene (vapor intrusion from ground water).

There were no constituents identified as having the potential to migrate from ground water to the surface water of the Cuyahoga River at concentrations exceeding applicable human health or aquatic life water quality criteria. Therefore, no additional measures are necessary to address potential surface water exposures by human or ecological receptors.

Based on the results of the risk assessment the following risk management conclusions were drawn:

- Potential excess lifetime cancer risks for the outdoor and construction workers are based on incidental ingestion and dermal contact with potentially carcinogenic PAHs in soil;
- A potential excess lifetime cancer risk for the future indoor worker is based on inhalation of benzene(vapor intrusion from ground water);
- To prevent potential soil exposures for future outdoor workers, install an isolation barrier to block direct contact with the soil and eliminate fugitive emissions, and mitigating potential for exposure for outdoor workers;
- Use restrictions placed on the property in the form of an Environmental Covenant would
 - 1) Restrict property use
 - 2) Restrict ground water use
 - 3) Restrict all invasive activities
- No additional measures are necessary to address potential surface water exposures by human or ecological receptors because modeling showed no constituents were identified as having the potential to migrate from ground water to the surface water of the Cuyahoga River at concentrations exceeding applicable human health or aquatic life water quality criteria;
- The direct contact exposure pathway for ground water via human consumption is incomplete because of the "Urban Setting" designation for the area and ground

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water is not used for any purpose. An Environmental Covenant will restrict all use of ground water.

4.0 EVALUATION AND SELECTION OF REMEDIES

4.1 Description of the Evaluation Criteria

As part of the facility investigation/corrective measures/remedy study process, criteria for evaluating potential remedies were developed by U.S. EPA under the RCRA corrective action program. The evaluation criteria are found in U.S. EPA guidance documents. The criteria are used by Ohio EPA to evaluate the remedies for a facility when it is determined that environmental conditions on the property require some type of action to reduce the potential risk to human health and the environment, posed by the presence of environmental contaminants, to acceptable levels. The evaluation criteria are listed and described below:

Remedy Selection Evaluation Criteria

For a proposed remedy to be considered a viable remedy when implemented, it must meet the threshold criterion that it be protective of human health and the environment. An option of "no action" to be implemented to address the contaminated soils is not acceptable to Ohio EPA. Even though the intended use of the property is industrial, there is no legally enforceable mechanism in place to prevent the property from being converted to residential use in the future.

To ensure the affected portion of the property continues to be used only for industrial purposes, Ohio EPA considered as a remedy that the property owner and Ohio EPA enter into an Environmental Covenant. An Environmental Covenant is a legally enforceable mechanism that would describe the property and limits its use to industrial purposes. The Covenant would list appropriate land use while also describing what uses would not be allowable. The Covenant would run with the land and attach to the property deed and could not be changed without the written agreement of both the property owner and Ohio EPA even if the property was sold at some point in the future. Ohio EPA would monitor the property periodically to ensure that its use was consistent with the allowed uses listed in the Covenant.

In addition, an isolation barrier would be required to be placed on the property. "Isolation barrier" is designated as a surface of soil, slag, concrete, asphalt or similar material that prevents exposure of surface soils to future industrial and construction

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workers. An Operation & Maintenance Plan for the protective cover would be developed and implemented.

4.2 Ohio EPA's Evaluation of the Selected Remedies

Ohio EPA reviewed the RCRA Corrective Action Investigation Final Report provided by Vertellus. The following remedies were evaluated using the criteria described in Section 4.1.

- Land use restrictions
 - (Environmental Covenant)
- Isolation barrier
 - Eliminate worker exposures
 - Restrictions on excavation
 - Fencing and vegetation management plan
 - Installation of a cover
 - Maintaining a cover
 - Monitoring well abandonment
- Downgradient monitoring well maintenance and periodic evaluation of ground water migration.

Description of Remedy

Ohio EPA is requiring an Environmental Covenant, an isolation barrier or cover system to eliminate unacceptable exposures to hazardous constituents and monitoring of the ground water to ensure the remedy remains in place and effective into the future.

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Environmental Covenant

- The facility must enter into an Environmental Covenant prohibiting the following activities at the facility: 1) use of ground water except for the purposes of monitoring and remediation; 2) any use other than industrial operations; 3) any disturbance of or below the two foot isolation barrier with the exception of monitoring or remediation activities or utility work and 4) placement of any type of structure (mobile or permanent) above the isolation barrier that does not also have satisfactory protective controls addressing potential vapor intrusion, including controls preventing vapor migration along any installed utilities.

Isolation Barrier

- The facility must install a two foot isolation barrier over areas of the property that were previously used for operations (only the existing green space along Independence Road would not require any new cover).
- The isolation barrier may consist of slag, clay or other materials in proposed storage areas. Ohio EPA approval of construction materials and a plan for implementation of the isolation barrier is required before construction.
- Those areas of the facility property that are not used for storage will not necessarily be covered with slag but other materials which may include soil or asphalt, or a combination, depending on the final plans for the facility property. The facility will establish a flexible approach to accommodate the beneficial reuse of the facility property.
- Tasks that are to be completed for constructing an outdoor storage area or other site development include: obtaining appropriate permit(s); filling pits, sumps, trenches and other man-made openings (not depressions); and demolishing or knocking over obstructions extending more than a few feet above existing grade (large concrete structures will be left in place). All concrete and paving that is below grade or up to a few feet above grade may be left in-place.
- Any soils unearthed by demolition actions or installation of an access ramp will be evaluated and receive Ohio EPA approval before disposition.
- The retaining walls currently at the facility property may be incorporated into the final isolation barrier design.

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- Any construction work or other invasive activities, including the installation or maintenance of utilities, must be performed under a Health and Safety Plan that protects workers against unacceptable exposure to identified hazardous constituents. The Construction Plan must include notice/notification procedures to be implemented to ensure construction and utility workers are aware of site conditions.
 - In the event that property use precludes the use of soil or slag, asphalt may be the preferred approach for providing an isolation barrier. Any areas where an asphalt or concrete cap is used in lieu of 2 feet of soil or slag, as well as the areas with a 2 foot barrier require a construction, operation and maintenance plan that must be submitted to Ohio EPA for approval. Additionally, financial assurance would have to be provided for any ongoing operation and maintenance. Alternatively, where surface soils pose a direct exposure pathway, a suitable soil type and thickness will be proposed for Ohio EPA approval as an isolation cover to promote the growth of vegetation.
 - Storm drainage will be addressed as part of permitting in accordance with regulatory requirements. The design will ensure that there is no erosion of the slag, and no sediment-laden runoff from the isolation barrier slag.
 - All soils placed as part of the isolation barrier will be seeded. Slag will not have a vegetative cover.

Ground Water Monitoring

- The facility will ensure proper monitoring well abandonment of on-site wells which could be compromised by the anticipated use. The proposed outdoor storage activities would incorporate heavy machinery and truck traffic. This traffic could damage the above grade monitoring wells. The facility may alternatively choose to keep the wells in place and engineer a protective structure around the well head to ensure it will not be compromised.

The facility must ensure proper maintaining and periodic sampling of the downgradient monitoring wells. These monitoring wells should be left in place and entered into an ongoing operation and maintenance plan. This plan would require approval by Ohio EPA. Included in the plan would be action detection limits for the downgradient wells.

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Evaluation of How the Selected Remedies Meet the Threshold Criteria

The threshold criteria discussed in Section 4.1 above are met, via the implementation of an isolation barrier and land use limitation through an Environmental Covenant.

An Environmental Covenant, under Ohio Revised Code §5301.80 to §5301.92, Ohio's version of the Uniform Environmental Covenants Act, is defined as a real property servitude arising under an environmental response project (or Corrective Action) that imposes activity or use limitations on the facility property. As a servitude, the Environmental Covenant is a legal device that creates a right or an obligation that runs with the land (and is binding upon future property owners) and is enforceable by Ohio EPA. The Environmental Covenant will include a legal description of the property, the areas of contamination and the land use restriction. Ohio EPA will monitor the owner's adherence to the Environmental Covenant to ensure continued protection of human health and the environment.

The institutional control (Environmental Covenant) will prohibit the use of the shallow ground water across the entire facility. The assessment assumed there would be no human exposure to the ground water. Accordingly, Ohio EPA believes that human health will be protected if on-site use of the shallow ground water is prohibited. The assessment found that contamination in the shallow ground water is unlikely to migrate off the Reilly Tar property.

The site-wide institutional controls and physical barriers will prohibit excavation work at the facility property that would breach a two foot barrier, and prohibit construction of any type of building without satisfactory vapor intrusion controls. The Human Health Risk Assessment concluded that cancer risks of excavation workers at the facility property exceed Ohio EPA's cancer risk level of 10^{-5} . The facility shall ensure through notice/notification means that utility and construction workers are aware of the site conditions. Therefore, Ohio EPA believes that human health will be protected if institutional controls are implemented.

The Environmental Covenant ensuring land use restrictions, the specified engineering isolation measures, and mandated environmental monitoring requirements designed to control the potential environmental risk of residual contamination, will be reflected on the land records and effectively inspected, maintained and enforced over time as a valid real property servitude assuring both short and long term reliability and effectiveness of the remedy.

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5.0 CONCLUSIONS

In conclusion, as they meet the threshold criteria for remedy acceptability, Ohio EPA has selected each of the remedies discussed in Section 4.2., Ohio EPA's Evaluation of the Selected Remedies. In addition, the facility will continue to maintain the financial instruments required to cover all associated costs of the site, including design, installation and maintenance of the isolation barrier.

ATTACHMENT B

**CORRECTIVE MEASURES IMPLEMENTATION
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 pursuant to the Director's Final Findings and Orders (Orders) to which this SOW applies. The work performed under this Order will implement the corrective measures that have been selected by Ohio EPA in the Decision Document and response to comments and any amendments thereto specified through Ohio EPA. The Respondent Vertellus Specialties Inc. will furnish all personnel, materials, and services necessary for the implementation of the corrective measures.

SCOPE

The Corrective Measures Implementation consists of four tasks:

- Task I: Corrective Measures Implementation Work Plan-Project Management 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 Measure Construction and Construction Completion Report

- Task IV: Reports and Submissions
 - A. Quarterly Progress Reports of Corrective Measures Implementation
 - B. Annual Progress Reports
 - C. Submittal Summary

Further specifications of the work outlined in this SOW will be provided in the Corrective Measures Implementation Work Plan and subsequent plans to be reviewed and approved by Ohio EPA. Variations from the SOW will be made, if necessary, subject to Ohio EPA review, comment and approval to fulfill the objectives of the Corrective Measures set forth in the Decision Document and any amendments thereto.

Additional studies may be needed as part of the Corrective Measures Implementation to supplement the available data. At the direction of Ohio EPA for any such studies required, the Respondent Vertellus Specialties Inc. 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 and maintain the integrity of the required protective barrier and/or monitoring system.

TASK I: CORRECTIVE MEASURE IMPLEMENTATION WORK PLAN

The Respondent Vertellus Specialties Inc. shall prepare a Corrective Measure 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 as defined in the Order and the Decision Document and any amendments thereto. 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 the performance of this Order.

The CMI Work Plan shall include the following:

Project Management Plan: The Respondent Vertellus Specialties Inc. 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 measure(s);
2. Description of the responsibility and authority of all organizations and key personnel involved with the implementation;
3. Description of the qualifications of key personnel directing the CMI, including contractor personnel;
4. An outline of proposed field activities and timing of each necessary to complete the CMI Design;

5. A description of how the conceptual design is expected to meet the technical requirements of the Decision Document and any amendments thereto;
6. A list and description of materials to be used in the construction of the barrier including analytical data as needed to demonstrate the material(s) is acceptable as a protective barrier and does not present any unacceptable risk to human health or the environment; and
7. Schedule of work including sequence of activities to be performed during the CMI and proposed timing for submittals required during the CMI.

TASK II: CORRECTIVE MEASURE DESIGN

The Respondent Vertellus Specialties Inc. shall prepare a Final Design Plan including specifications and a construction plan to implement the corrective measures at the facility as set forth in the Decision Document and any amendments thereto.

- A. Design Plans and Specifications: The Respondent Vertellus Specialties Inc. 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 including: (a) use of currently accepted environmental control measures and technology; (b) the construct-ability of the design, and; (c) use of currently accepted construction practices and techniques.
 3. Detailed drawings of the proposed design and design specifications ensuring the barrier is a minimum two foot thick and perimeter details;
 4. Tables listing equipment and specifications;
 5. 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 (and outline/table of contents) of

documents and plans to be prepared and submitted with Final Design.
(applicability example: run-on/run-off controls)

6. Real Estate Easements, Environmental Covenant, and permit or variance requirements, if any.

B. Operation and Maintenance Plan: The Respondent Vertellus Specialties Inc. shall prepare or revise the Operation and Maintenance ("O&M ") Plan to cover both the implementation and short 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 Decision Document 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 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 troubleshooting 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 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. A description of proper ground water monitoring well abandonment procedures for wells where it has been determined that monitoring is no longer necessary and a time schedule to complete.
4. 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 Local agencies.

C. Health and Safety Plan: The Respondent Vertellus Specialties Inc. shall prepare a Health and Safety Plan to address all work to be performed at the facility to implement the corrective measures set forth in the Decision Document. This document will be submitted to Ohio EPA but does not require approval by Ohio EPA. The Health and Safety Plan shall be designed to protect on-site personnel and area residents from

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physical, chemical and other hazards posed by the CMI, including pre-design studies if applicable.

- D. Sampling and Analysis Plan/Performance Monitoring Plan: Respondent Vertellus Specialties Inc. shall update the Sampling and Analysis Plan (for barrier materials and ground water monitoring), including the Quality Assurance Project Plan (QAP) as necessary and appropriate, to reflect changes in the following: responsibility and authority; personnel qualifications; inspection activities; sampling requirements; and, documentation and reporting. An addendum or a separate document shall be prepared (Performance Monitoring Plan) to describe the performance monitoring program that will be used to measure the effectiveness of the corrective measures set forth in the Decision Document. 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. Since waste is being left in place, a ground water monitoring program (including three existing monitoring wells, MW's-2, 3 and 6) must be established at the property boundary to evaluate whether risk-based standards are being exceeded at the property boundary now or in the future. The program must be in accordance with OAC Rule 3745-54-100(D) & (E) requiring that the facility establish and implement a groundwater monitoring program (GWMP) to demonstrate the effectiveness of the corrective action program. The GWMP and modifications are subject to Ohio EPA review, comment and approval.
- E. Cost Estimate: Respondent shall provide the cost estimate including both capital, O&M, and monitoring costs for a period of thirty years.

TASK III: CORRECTIVE MEASURE CONSTRUCTION AND CONSTRUCTION COMPLETION REPORT

Following Ohio EPA approval of the Final CMI Design Report, the Respondent Vertellus Specialties Inc. 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, Respondent Vertellus Specialties Inc. will continue to submit periodic progress reports (Task IV). The Respondent Vertellus Specialties Inc. 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, Respondent Vertellus Specialties Inc. will prepare and submit a CMI Construction Completion Report.

The CMI Construction Completion Report shall describe activities performed during construction, provide actual (as-built) specifications of the implemented remedy, and provide a preliminary

assessment of CMI performance. The CMI Construction Completion Report shall include, but not be limited to, the following elements:

1. Synopsis of the corrective measure 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 measure is functioning properly, and also explaining any modification to these criteria;
4. Signature of the Respondent's responsible official as designated in accordance with Section XI of these Orders; and,
5. Include 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 with elevations, cross sections and an elevation survey by a certified surveyor of the top of the barrier elevation.

The Respondent Vertellus Specialties Inc. shall provide Ohio EPA a minimum five business day notice prior to conducting any corrective measure implementation or monitoring event.

TASK IV: PROGRESS REPORTS AND SUBMISSIONS

The Respondent Vertellus Specialties Inc. 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 Corrective Measures Implementation: Until the Corrective Measures have been installed, the Respondent Vertellus Specialties Inc. shall provide the 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 Corrective Measures Implementation 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 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 installed, the Respondent Vertellus Specialties Inc. shall provide Ohio EPA with signed annual progress reports and/or Corrective Measures Assessment Reports containing:

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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 groundwater levels and flow direction, and groundwater 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 and condition and thickness of barrier, and
 - b. Any proposed changes to the corrective measure and summary of previous changes.
- C. Five-Year Report: In lieu of every fifth annual report, the Respondent Vertellus Specialties Inc. 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 Corrective Measures Implementation (CMI), including:
 - a. Reassessment of models, plans, and goals used by the CMI process,
 - b. Any changes and/or additions to the existing systems that may be required to meet CMI goals
 - c. When appropriate, notification that corrective actions media cleanup standards have been achieved.
- D. 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	Within 90 days after the effective date of the Orders.
Final CMI Work Plan (revision of Draft CMI Work Plan)	30 days after receipt of Ohio EPA's comments on Draft CMI Work Plan
Final CMI Design Plan Design Plans and Specifications Operation and Maintenance Plan Health and Safety Plan/ Sampling Analysis Plan/Performance Monitoring Plan Ground Water Monitoring Plan Cost Estimate	In accordance with the schedule in the Final CMI Work Plan

CMI Construction Completion 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	During construction activities only, submitted by the last day of every third month following the effective date of the Orders.
Annual Progress Reports	Submitted on or before the last day in January, annually (excluding every 5 th year)
Five-Year Corrective Measures Implementation Report	Submitted in lieu of every 5 th Annual Progress Report, in January

ATTACHMENT C

LIST OF GUIDANCE DOCUMENTS AND REFERENCES FOR USE WITH OHIO EPA DERR REMEDIAL RESPONSE PROGRAM RCRA CORRECTIVE ACTION STATEMENT OF WORK AND ORDERS

Statement of Purpose and Use of This Guidance Document List:

The purpose of this list of Ohio EPA and U.S. EPA policies, directives and guidance documents is to provide a reference of the primary documents which provide direction and guidance for designing and implementing selected corrective actions at Corrective Action sites. The listed documents incorporate by reference any documents listed therein. Certain sites may have contaminants or conditions which are not fully addressed by the documents in this list. There is an evolving body of policy directives, guidance and research documentation which should be used, as needed, to address circumstances not encompassed by the documents in this list. For sites where activities are conducted in response to an administrative or judicial order, this list will be an attachment to the order and will govern the work conducted. When entering into or issuing an order for any site, Ohio EPA reserves the right to modify this list to fully address the site conditions.

Analytical Methods

Compendium of Methods for Determination of Toxic Organic Compounds in Ambient Air second edition, Compendium Method TO-14A, EPA/625/R-96/010b, U.S. EPA, January 1999. See also: Air Toxics – Monitoring Methods.

SW 846, Test Methods for Evaluating Solid Waste, 3rd Edition and updates (online), originally dated November 1986.

Standard Methods for the Examination of Water and Waste Water, American Public Health Association, 18th Edition 1992, and recent editions (online).

U.S. EPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, U.S. EPA, EPA-540-R-04-004, OSWER 9240.1-45, October 2004.

Data Quality Objectives

Data Quality Evaluation Statistical Toolbox (Data QUEST) Users Guide, U.S. EPA ORD, EPA/600/R-96/085 (EPA QA/G-9D), December 1997. No longer available. For a link to other free software for performing data quality assessment, see Quality-Related Resources – Software.

Data Quality Objectives Decision Error Feasibility Trials Software (DEFT) – Users Guide, U.S. EPA, EPA QA/G-4D, EPA/240/B-01/007, September 2001.

Data Quality Objectives Process for Hazardous Waste Site Investigations, U.S. EPA, EPA/600/R-00/007 (EPA QA/G-4HW), January 2000.

Data Quality Objectives Process Summary, DERR-00-DI-32 Ohio EPA DERR Remedial Response Program, January 2002.

Guidance for Data Quality Assessment: Practical Methods for Data Analysis, U.S. EPA, EPA/600/R-96/084 (EPA QA/G-9), QAOO Update, July 2000.

Guidance on Systematic Planning Using the Data Quality Objectives Process, U.S. EPA, EPA QA/G-4, EPA/240/B-06/001, February 2006.

Health and Safety Plan

American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices, ISBN: 1-882417-46-1, 2002.

NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, DHHS (NIOSH) Publication No. 85-115, October 1985.

NIOSH Pocket Guide to Chemical Hazards, National Institute for Occupational Safety and Health (online, last updated November 2010).

OSHA Regulations particularly in 29 CFR 1910 and 1926

OSHA Regulation 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response; U.S. Department of Labor (OSHA).

OSHA Regulation 29 CFR 1910.134, Respiratory Protection Standard;

U.S. EPA Standard Operating Safety Guides (Publication 9285.1-03, PB92-963414, June 1992 (chapters 1-3, 4-7, 8-11))

Landfills

Seminar Publication - Requirements for Hazardous Waste Landfill Design, Construction, and Closure, U.S. EPA, EPA/625/4-89/022, August 1989 (# 625489022).

Technical Guidance Document: Final Covers on Hazardous Waste Landfills and Surface Impoundments, U.S. EPA, EPA/530-SW-89-047, July 1989 (# 530SW89047).

Lead

Integrated Exposure Uptake Biokinetic Model for Lead in Children, Windows® version (IEUBKwin v1.0 build 263) (December, 2005).

Groundwater Remediation and Monitored Natural Attenuation

Calculation and Use of First-Order Rate Constants for Monitored Natural Attenuation Studies, U.S. EPA, EPA/540/S-02/500, November 2002.

Considerations in Ground-Water Remediation at Superfund Sites and RCRA Facilities, U.S. EPA, OSWER Directive 9283.1-06, May 1992.

Distinction between Monitored Natural Attenuation and Enhanced Monitoring at DERR Remedial Response Sites, Ohio EPA DERR Remedial Response Program, October 2002.

Handbook of Groundwater Protection and Cleanup Policies for RCRA Corrective Action, U.S. EPA, EPA/530/R-04/030, April 2004.

Natural Attenuation for Groundwater Remediation, Committee on Intrinsic Remediation, National Academy of Sciences, 2000.

Performance Monitoring of MNA Remedies for VOCs in Ground Water, U.S. EPA, EPA/600/R-04/027, April 2004.

RCRA Comprehensive Ground-Water Monitoring Evaluation Document, U.S. EPA, OSWER Directive 9950.2, March 1988.

RCRA Comprehensive Ground-Water Monitoring Evaluation (CME) Handbook, U.S. EPA, EPA/905/R-90/109, 1990..

Remediation Using Monitored Natural Attenuation, Ohio EPA DERR Remedial Response Program, January 2001.

Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents In Ground Water, U.S. EPA, EPA/600/R-98/128, September 1998.

Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action and Underground Storage Tank Sites, U.S. EPA, OSWER Directive 9200.4-17P, April 1999.

Quality Assurance

Data Quality Assessment: A Reviewer's Guide, (QA/G-9R), U.S. EPA, EPA/240/B-06/002, February, 2006.

Data Quality Assessment: Statistical Methods for Practitioners, U.S. EPA, EPA/240/B-06/003 (EPA QA/G-9S), February 2006

Guidance for Preparing Standard Operating Procedures, U.S. EPA, EPA QA/G-6, EPA/240/B-01/004, March 2001.

Guidance for Quality Assurance Plans for Modeling, U.S. EPA, EPA QA/G-5M, EPA/240-R02/007, December, 2002.

Guidance for Quality Assurance Project Plans, U.S. EPA, QA-G-5, EPA/240/R-02-009, December 2002.

Guidance on Environmental Data Verification and Data Validation, U.S. EPA, EPA/240/R-02/004, November 2002.

Guidelines and Specifications for Preparing Quality Assurance Project Plans, Ohio EPA, DERR-00-RR-008, September 1998.

Laboratory and Field Data Screening for Preparing Quality Assurance Project Plans, Ohio EPA DERR. DI-00-034, August 2005.

Preparation Aids for the Development of Category 1 Quality Assurance Project Plans, U.S. EPA, EPA/600-8-91-003, February 1991 (#600891003).

Quality Assurance/Quality Control Guidance for Removal Activities: Sampling QA/QC Plan and Data Validation Procedures, Interim Final, U.S. EPA, EPA/540/G-90/004, April 1990 (# 540G90004).

Technical Guidance Document: Construction Quality Assurance and Quality Control for Waste Containment Facilities, U.S. EPA, EPA/600/R-93/182, September 1993 (# 600R93182).

Corrective Action – General Guidance

A Compendium of Technologies Used in the Treatment of Hazardous Wastes, U.S. EPA, EPA/625/8-87/014, September 1987 (# 625887014).

Closure Criteria Focus Group Report, ITRC Work Group In Situ Bioremediation - Technologies Task Team, March 1998.

Contaminated Sediment Remediation Guidance for Hazardous Waste Sites, OSWER, EPA-540-R-05-012, December 2005.

Corrective Action Handbook, Ohio EPA Division of Hazardous Waste Management, February 2005 (updated June 2009).

Cost & Performance Reporting for In-Situ Bioremediation Technologies, ITRC In Situ Bioremediation Technical Task Team, Final, December 1997.

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General Protocol for Demonstration of In Situ Bioremediation Technologies, ITRC Workgroup – In Situ Bioremediation Work Team, September 1998.

Guidance for Evaluating the Technical Impracticability of Ground Water Restoration, OSWER Directive 9234.2-25.

Handbook - Dust Control at Hazardous Waste Sites, U.S. EPA, EPA/540/2-85/003, November 1985 (# 540285003).

Handbook for Stabilization/Solidification of Hazardous Wastes, U.S. EPA, EPA/540/2-86/001, June 1986 (# 540286001).

Handbook - Guidance on Setting Permit Conditions and Reporting Trial Burn Results - Volume II of the Hazardous Waste Incineration Guidance Series, U.S. EPA, EPA/625/6-89/019, January 1989 (# 625689019).

Handbook - Hazardous Waste Incineration Measurement Guidance Manual - Volume III of the Hazardous Waste Incineration Guidance Series, U.S. EPA, EPA/625/6-89/021, June 1989 (# 625689021).

Handbook on In Situ Treatment of Hazardous Waste-Contaminated Soils, U.S. EPA, EPA/540/2-90/002, January 1990, (hard copy/microfilm available through NTIS PB90-155607/XAB).

Handbook - Quality Assurance/Quality Control (QA/QC) Procedures for Hazardous Waste Incineration, U.S. EPA, EPA/625/6-89/023, January 1990 (# 625689023).

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Management of Remediation Waste Under RCRA, U.S. EPA, EPA/530/F-98/026, October 1998.

Procedures for Evaluation of Response Action Alternatives and Remedial Selection for Remedial Response Program Sites, Ohio EPA Policy No. DERR-00-RR-019, Final, October 23, 1992 (September 14, 1999, Revised).

Pump-and-Treat Ground-Water Remediation: A Guide for Decision Makers and Practitioners, U.S. EPA ORD, EPA/625/R-95/005, July, 1996.

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Regulatory Guidance for Permeable Barriers to Remediate Inorganics and radionuclides, Interstate Technology Regulatory Council (ITRC) Permeable Reactive Barriers Work Group, September 1999.

Stabilization/Solidification of CERCLA and RCRA Wastes - Physical Tests, Chemical Testing Procedures, Technology Screening and Field Activities, U.S. EPA, EPA/625/6-89/022, May 1989 (# 625689022).

Technical and Regulatory Guidelines for Soil Washing, Interstate Technology Regulatory Council (ITRC) Metals in Soils Work Team – Soil Washing Project, Final, December 1997.

Technical Requirements for On-site Low Temperature Thermal Treatment of Non-Hazardous Soils Contaminated with Petroleum/Coal Tar/ Gas Plant Wastes, Interstate Technology Regulatory Council (ITRC) Low Temperature Thermal Desorption Work Team, Final, May 1996.

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Technical Requirements for On-Site Thermal Desorption of Solid Media Contaminated and Low Level Mixed Waste Contaminated with Mercury and/or Hazardous Chlorinated Organics, Interstate Technology Regulatory Council (ITRC) Low Temperature Thermal Desorption Work Team, Final, September 1998.

Wastewater Discharges Resulting from Clean-Up of Response Action Sites Contaminated with Volatile Organic Compounds, Ohio EPA Policy No. DSW-DERR 0100.027, Final, September 22, 1994, as revised.

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A Rationale for the Assessment of Errors in the Sampling of Soils, U.S. EPA – Environmental Monitoring Systems Laboratory, EPA/600/4-90/013, July 1990.

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Vapor Intrusion

Sample Collection and Evaluation of Vapor Intrusion to Indoor Air, Ohio EPA DERR, May 2010.

Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance), U.S. EPA, EPA530-D-02-004, November 2002.

Vapor Intrusion Pathway: A Practical Guideline, Technical and Regulatory Guidance, Interstate Technology Regulatory Council (ITRC) – Vapor Intrusion Team, January 2007.

Vapor Intrusion Pathway: Investigative Approaches for Typical Scenarios, Technical and Regulatory Guidance Supplement, Interstate Technology Regulatory Council (ITRC) – Vapor Intrusion Team, January 2007.

Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air, Department of Toxic Substances Control, California Environmental Protection Agency, 2011.

Vapor Intrusion Technical Guidance, New Jersey Department of Environmental Protection, January 2012.

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