

OHIO ENVIRONMENTAL PROTECTION AGENCY

**OHIO HAZARDOUS WASTE FACILITY
INSTALLATION AND OPERATION PERMIT RENEWAL**

Permittee: BP Products North America
Lima Refining Company

Mailing Address: Lima Refinery
1150 South Metcalf Street
Lima, Ohio 45804-1199

Owner: BP Products North America
Lima Refining Company
1150 South Metcalf Street
Lima, Ohio 45804-1199

Operator: BP Products North America
Lima Refining Company
1150 South Metcalf Street
Lima, Ohio 45804-1199

Location: 1150 South Metcalf Street
Lima, OH 45804-1199

Ohio Permit No.:	03-02-0390
US EPA ID:	OHD 005 051 826
Issue Date:	June 20, 2003
Effective Date:	June 20, 2003
Expiration Date:	June 20, 2013

AUTHORIZED ACTIVITIES

In reference to the application of BP Products North America/Lima Refining Company, for an Ohio Hazardous Waste Facility Installation and Operation Renewal Permit under Ohio Revised Code (ORC) Chapter 3734 and the record in this matter, you are authorized to conduct at the above-named facility the following hazardous waste management activities:

- ◆ **Post-Closure**
- ◆ **Corrective Action**

Keyword: jms; 070220-3a-1 permit cover page_final.doc

OHIO EPA DHWM

OCT 25 2007

MODULE A – GENERAL PERMIT CONDITIONS

A.1. Effect of Permit

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

- a) The Permittee is authorized to conduct closure, post closure, and corrective action activities in accordance with the terms and conditions of this permit, ORC Chapter 3734, all applicable Ohio hazardous waste rules, all applicable regulations promulgated under the Resource Conservation and Recovery Act (RCRA), as amended, and the approved hazardous waste facility installation and operation permit renewal application, as such application has been revised and supplemented and as such application may be modified pursuant to the hazardous waste rules. The renewal of the surface impoundments and the landfarms is for the purposes of accomplishing closure and post closure activities. These units are currently inactive and undergoing closure. These units shall not be reactivated for management of hazardous waste. The approved Part B permit application as submitted to Ohio EPA on March 26, 1997 and any subsequent amendment thereto including the latest Part B Application revision submitted August 13, 1999, is hereby incorporated into this permit. In the instance of inconsistent language or discrepancies between the above, the language of the more stringent provision shall govern.
- b) Any management of hazardous waste not authorized by this permit is prohibited, unless otherwise expressly authorized or specifically exempted by law. Issuance of this permit does not convey property rights of any sort or any exclusive privilege; nor does it authorize any injury to persons or property, or invasion of other private rights. Compliance with the terms and conditions of this permit does not obviate Permittee's obligation to comply with other applicable provisions of law governing protection of public health or the environment including but not limited to the Community Right to Know law under ORC Chapter 3750.
- c) For the purposes of this permit, the facility owners are BP Products North America and Lima Refining Company. The owners are not responsible for the acts or omissions concerning new or newly created RCRA responsibilities under the terms of the facility permit that occur on a parcel owned by another facility parcel owner unless the owner meets the definition of an operator for that new or newly created RCRA responsibility. New or newly created responsibilities are those that occur on or after the effective date of this permit.

A.2. Permit Actions

OAC Rule 3745-50-58(F)

This permit may be modified, revoked, suspended, or renewed as specified by Ohio law. The filing of a request for a permit modification, revision, revocation,

suspension, or renewal or the notification of planned changes or anticipated noncompliance on the part of the Permittee, does not stay the applicability or enforceability of any permit term or condition.

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

The effective date of this permit is the date the permit is entered into the Director's Journal. The permit expiration date is June 20, 2013.

A.4. Severability

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

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

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

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

- a) If the Permittee wishes to continue an activity allowed by this permit after the expiration date of this permit, the Permittee must submit a completed application for a hazardous waste facility installation and operation permit renewal and any necessary accompanying general plans, detailed plans, specifications, and such information as the Director may require, to the

Director no later than one hundred eighty (180) days before the expiration date of this permit or upon approval of the Director a later date prior to the expiration date if the Permittee can demonstrate good cause for late submittal.

- b) The Permittee may continue to operate in accordance with the terms and conditions of the expired permit until a renewal permit is issued or denied if:
 - i) the Permittee has submitted a timely and complete application for a renewal permit under OAC Rule 3745-50-40; and
 - ii) through no fault of the Permittee, a new permit has not been issued pursuant to OAC Rule 3745-50-40 on or before the expiration date of this permit.

- c) The corrective action obligations contained in this permit will continue regardless of whether the facility continues to operate or ceases operation and closes. The Permittee is obligated to complete facility-side corrective action under the conditions of this permit regardless of the operational status of the facility. The Permittee must submit an application for permit reissuance at least 180 days before the expiration date of this permit pursuant to OAC Rule 3745-50-40(D) unless a) the permit has been modified to terminate the corrective action schedule of compliance and the Permittee has been released from the requirements for financial assurance for corrective action; or b) permission for a later date has been granted by the Director. The Director shall not grant permission for applications to be submitted later than the expiration date of the existing permit.

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

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

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

The Permittee shall expeditiously take all reasonable steps necessary to minimize or correct any adverse impact on the environment or the public health resulting from noncompliance with this permit.

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

The Permittee shall at all times properly operate and maintain the facility (and related appurtenances) to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance includes, but is not limited to, effective management practices, adequate funding, adequate operator staffing and training, and where appropriate, adequate laboratory and process controls, including appropriate quality assurance/quality control procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the terms and conditions of this permit.

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

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

A.11. Inspection and Entry
OAC Rules 3745-50-58(I) and 3745-50-30 and ORC Section 3734.07

- a) The Permittee shall allow the Director, or an authorized representative, upon stating the purpose and necessity of the inspection and upon proper identification to:
 - i) enter at reasonable times upon the Permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the terms and conditions of this permit;

- ii) have access to and copy, at reasonable times, any records required to be kept under the terms and conditions of this permit;
 - iii) inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under the terms and conditions of this permit; and
 - iv) sample, document (including but not limited to the use of videotape and camera equipment) or monitor, at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by ORC Chapter 3734 and the rules adopted thereunder, any substances or parameter at any location.
- b) Any record, report or other information obtained under the hazardous waste rules or Chapter 3734 of the Revised Code shall not be available to the public upon the Permittee's satisfactory showing to Ohio EPA that all or part of the information would divulge methods or processes entitled to protection as trade secrets pursuant to Ohio Trade Secret Law and OAC Rule 3745-50-30.

A.12. Monitoring and Records
OAC Rule 3745-50-58-(J)

- a) Any sample and measurement taken for the purpose of monitoring shall be a representative sample or measurement, as such term is defined and used in the Ohio hazardous waste rules. The method used to obtain a representative sample of the waste to be analyzed must be the appropriate method from Appendix I of OAC Rule 3745-51-20, Laboratory Methods. Laboratory methods must be those specified in Test Methods for the Evaluation of Solid Waste: Physical/Chemical Methods; SW-846: Third Edition, November 1992; and additional supplements or editions thereof; Standard Methods for the Examination of Water and Wastewater: Seventeenth Edition, 1989; or an equivalent method as specified in the approved waste analysis plan, or as such term is defined and used in the Ohio hazardous waste rules.
- b) Records of monitoring information shall specify the:
 - i) date(s), exact place(s), and time(s) of sampling or measurements;

- ii) individual(s) who performed the sampling or measurements;
- iii) date(s) analyses were performed;
- iv) individual(s) who performed the analyses;
- v) sampling and monitoring equipment used, including calibration settings;
- vi) analytical technique(s) or method(s) used; and
- vii) results of such analyses.

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

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

A.14. Retention of Records
OAC Rules 3745-50-58(J) and 3745-50-58(M)

- a) The Permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports and records required by this permit, the certification required by paragraph B(9) of rule 3745-54-73 of the Administrative Code, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report, certification, or application.
- b) The record retention period may be extended by request of the Director at any time and is automatically extended during the course of any unresolved enforcement action regarding the facility. Once any enforcement action is resolved, the Permittee shall maintain relevant documentation for a period of one year beyond the date of final resolution or three years from the original date of sample measurement, report of record, whichever is greater.

- c) The Permittee shall maintain, in accordance with the Ohio hazardous waste rules, records of all data used to complete the Part B permit application and any amendments, supplements, modifications or revisions, of such application and shall retain a complete copy of the application for the life of the facility.
- d) The Permittee shall maintain records from all ground water monitoring wells and associated ground water surface elevations for the active life of the facility, and for disposal facilities for the post-closure care period as well.
- e) Corrective action records must be maintained at least 3 years after all corrective action activities have been completed.

A.15. Planned Changes

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

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

A.16. Waste Shipments

OAC Rule 3745-52-12, ORC 3734.15(C)

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

A.17. Anticipated Noncompliance

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

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

A.18. Transfer of Permits

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

- a) This permit is not transferable to any person except after notice of the Director.

OHIO EPA DHHM

JUN 20 2003

- b) The permit may be transferred to a new owner or operator only if such transfer is conducted in accordance with ORC Chapter 3734 and the rules adopted thereunder. This permit may be transferred by the Permittee to a new owner or operator only if the permit has been modified under OAC Rule 3745-50-51. Before transferring ownership or operation of the facility the Permittee shall notify the new owner or operator in writing of the requirements of ORC Chapter 3734 and the rules adopted thereunder (including all applicable corrective action requirements).
- c) The Permittee's failure to notify the new owner or operator of the requirements of the applicable Ohio law or hazardous waste rules does not relieve the new owner or operator of its obligation to comply with all applicable requirements.

A.19. Compliance Reports

OAC Rules 3745-50-58(L)(5) and 3745-50-50

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

A.20. Immediate Reporting of Noncompliance

OAC Rule 3745-50-58(L)(6)

- a) The Permittee shall report orally to the Ohio Environmental Protection Agency's Division of Emergency and Remedial Response within two hours from the time the Permittee becomes aware of any noncompliance with this permit, ORC Chapter 3734 or the rules adopted thereunder, which endangers human health or the environment, including:
 - i) information concerning the release of any hazardous waste that may cause an endangerment to public drinking water supplies; and
 - ii) any information of a release or discharge of hazardous waste or a fire or explosion from the hazardous waste facility, which could threaten the environment or human health outside the facility.

- b) The report required by OAC Rule 3745-50-58(L)(6)(c) shall consist of the following information (if such information is available at the time of the oral report):
- i) name, address, and telephone number of the owner or operator;
 - ii) name, address, and telephone number of the facility;
 - iii) name and quantity of material(s) involved, including waste codes;
 - iv) the extent of injuries, if any;
 - v) an assessment of actual or potential hazards to the environment and human health outside the facility, where this is applicable; and
 - vi) estimated quantity and disposition of recovered material that resulted from the incident.

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

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

OHIO EPA DHWM

JUN 20 2008

A.22. Other Noncompliance

OAC Rules 3745-50-58(L)(10) and 3745-50-58(L)(4)

The Permittee shall report to the Director and the Division of Hazardous Waste Management District Office all other instances of noncompliance not provided for in Condition A.20. These reports shall be submitted within 20 days of the time at which the Permittee is aware of such noncompliance. Such reports shall contain all information set forth within Condition A.20 of this permit and OAC Rule 3745-50-58(L)(6).

A.23. Reserved.

A.24. Other Information

OAC Rule 3745-50-58(L)(11)

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

A.25. Confidential Information

OAC Rule 3745-50-30

In accordance with ORC Chapter 3734 and the rules adopted thereunder, the Permittee may request confidentiality of any information (other than discharge or emission data) required to be submitted by the terms and conditions of this permit. This includes any information obtained by the Director, or an authorized representative, pursuant to the authority provided under condition A.11 of this permit.

A.26. Reserved.

A.27. Compliance Schedule – Documents

- a) Unless specified otherwise, Permittee shall submit the documents listed below to:

Ohio EPA, DHWM
Attn: Regulatory and Information Services Section
P. O. Box 1049
Columbus, Ohio 43216-1049

and

Ohio EPA, Northwest District Office
Division of Hazardous Waste Management
347 North Dunbridge Road
Bowling Green, Ohio 43402

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

- i) Updated Closure/Post-Closure Cost Estimate
OAC Rules 3745-55-42 and 3745-55-44

Section I of the application containing the financial assurance mechanism for closure shall be updated to include a copy of the current closure/post-closure cost estimate as set forth in OAC Rules 3745-55-42 and 3745-55-44.

- ii) Updated Financial Assurance Mechanism for Closure
OAC Rules 3745-55-43 and 3745-55-45

Section I of the application containing the financial assurance mechanism for closure shall be updated to include a copy of the current financial assurance mechanism, as set forth in OAC Rules 3745-55-43 and 3745-55-45, and as specified by the wording requirements of OAC Rule 3745-55-51. The value of the financial assurance mechanism must reflect at least the current amount of the closure/post-closure cost estimate.

During the life of the Part B permit the facility may change the financial assurance mechanism as stated in OAC Rules 3745-55-43 and 3745-55-45. The facility must submit the financial assurance mechanism documentation to the Director of Ohio EPA in accordance with the parameters set forth in OAC Rules 3745-55-43 and 3745-55-45. In addition, send copies of the mechanism to DHWM's Compliance Assurance Section (CAS) and the Engineering and Risk Assessment Section (ERAS).

iii) Updated Liability Requirements
OAC Rule 3745-55-47

Section I of the application containing the financial assurance mechanism for closure shall be updated to include a copy of the current financial assurance mechanism as set forth in OAC Rule 3745-55-47 and as specified by the wording requirements of OAC Rule 3745-55-51.

During the life of the Part B permit the facility may change the mechanism used to demonstrate liability coverage as stated in OAC Rule 3745-55-47. The facility must submit the liability mechanism documentation to the Director of Ohio EPA in accordance with the parameters set forth in OAC Rule 3745-55-47. In addition, send copies of the mechanism to DHWM's CAS and ERAS.

A.28. Information to be Maintained at the Facility
OAC Rule 3745-54-74

- a) The Permittee shall maintain at the facility, until closure is completed and certified by an independent, registered professional engineer, pursuant to OAC Rule 3745-55-15, and until the Director releases the Permittee from financial assurance requirements pursuant to OAC Rule 3745-55-47, the following documents (including amendments, revisions and modifications):
- i) contingency plan developed and maintained in accordance with OAC Rule 3745-54-53 and the terms and conditions of this permit;
 - ii) closure plans, developed and maintained in accordance with OAC Rule 3745-55-12 and the terms and conditions of this permit;
 - iii) cost estimate for facility closure developed and maintained in accordance with OAC Rule 3745-55-42 and the terms and conditions of this permit;
 - iv) personnel training plan and the training records, as developed and maintained in accordance with OAC Rule 3745-54-16 and the terms and conditions of this permit;

OHIO EPA/DHWM

JUN 20 2003

- v) operating record required by OAC Rule 3745-54-73 and the terms and conditions of this permit;
 - vi) inspection schedules developed in accordance with OAC Rules 3745-54-15; 3745-55-74 and 3745-55-95; and the terms and conditions of this permit;
 - vii) Post-Closure Plans and Contingent Post-Closure Plans, as required by OAC Rule 3745-55-18(A) and this Permit;
 - viii) annually-adjusted cost estimate for facility closure and post-closure, as required by OAC Rules 3745-55-42 and 3745-55-44 and this Permit; and
 - ix) all other documents required by Module A, Permit Condition A.12.
- b) All amendments, revisions and modifications to any plan required by the terms and conditions of this permit or the Ohio hazardous waste rules shall be submitted to the Director. No such change shall be made unless the Permittee has received approval in accordance with the Ohio hazardous waste rules.
 - c) The Permittee shall maintain copies of all inspection logs at the facility for a period not less than three (3) years from the date of inspection.
 - d) Corrective Action reports and records as required by Module E of this permit. These reports and records must be maintained for at least 3 years after all Corrective Action Activities have been completed.

A.29. Reserved.

OHIO EPA DHWM

JUN 20 2003

MODULE B – GENERAL FACILITY CONDITIONS

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

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

B.2. Reserved.

B.3. Reserved.

B.4. Security
OAC Rule 3745-54-14

The Permittee shall comply with the security provisions of OAC Rule 3745-54-14 and the approved permit application.

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

The Permittee shall follow the inspection schedule set out in Appendix G of the Closure Plan of Primary and "C" Ponds, September 2001, of the approved Part B permit application. The Permittee shall remedy any deterioration or malfunction discovered by an inspection, as required by OAC Rule 3745-54-15(C). Records of inspection shall be kept as required by OAC Rule 3745-54-15.

B.6. Reserved.

B.7. Reserved.

B.8. Reserved.

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

At a minimum, the Permittee shall maintain at the facility all the equipment required by OAC Rule 3745-54-32 and the equipment set forth in Section F of the approved Part B permit application.

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

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

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

The Permittee shall maintain access to the communications systems, as required by OAC Rule 3745-54-34, Attachment E of the Part B permit application, and the terms and conditions of this permit.

B.12. Reserved.

B.13. Reserved.

B.14. Implementation of Contingency Plan
OAC Rules 3745-54-51 and 3745-54-56

The Permittee shall immediately carry out the provisions of the approved contingency plan found in Appendix G of the Closure Plan of Primary & "C" Ponds, September 2001 and follow the emergency procedures described in OAC Rule 3745-54-56, whenever there is a fire, explosion, or release of hazardous waste or hazardous waste constituents which threatens or could threaten human health or the environment.

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

The Permittee shall comply with OAC Rule 3745-54-52 and the contingency plan, as set forth in Appendix G of the Closure Plan of Primary & "C" Ponds, September 2001 of the approved Part B permit application.

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

All liquid or solid material resulting from fire, explosion, released material or emergency response material and by-products that the Permittee is required to evaluate to determine whether such material is hazardous waste in accordance with OAC Rule 3745-52-11, shall be collected and managed as a hazardous waste until such time as the Permittee can demonstrate that such waste is not hazardous in accordance with OAC Rules 3745-51-03(C) and (D).

B.17. Reserved.

B.18. Reserved.

B.19. Reserved.

B.20. Reserved.

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

The Permittee shall furnish upon Ohio EPA request, and retain all records at the Lima Facility in accordance with OAC Rule 3745-54-74.

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

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

B.23. Contingency Plan Records
OAC Rules 3745-54-73 and 3745-54-56(J)

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

B.24. Manifest System
OAC Rules 3745-54-70, 3745-54-71, 3745-54-72 and 3745-54-76

In the management of waste at the facility the Permittee shall comply with the provisions of OAC Chapter 3745-52 and OAC Rules 3745-54-71, 3745-54-72 and 3745-54-76 with regard to the manifest system.

B.25. Annual Reports and Additional Reports
OAC Rules 3745-54-77 and 3745-54-75

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

B.26. Reserved.

B.27. Reserved.

B.28. Reserved.

B.29. Reserved.

B.30. Reserved.

B.31. Reserved.

B.32. Reserved.

B.33. Reserved.

B.34. Reserved.

B.35. Reserved.

B.36. Cost Estimate for Facility Closure and Post-Closure
OAC Rules 3745-55-42 and 3745-55-44

- a) The Permittee's most recent closure cost and post-closure estimates, prepared in accordance with OAC Rules 3745-55-42, 3745-55-44, 3745-55-97(C)(3) & (5), 3745-56-28(C)(3) and 3745-56-58(C)(2) are specified in Volume I, Attachment A of the Part B permit application.
- b) The Permittee must adjust the closure and post-closure cost estimates for inflation within 60 days prior to the anniversary date of the establishment of the financial instrument(s) used to comply with OAC Rules 3745-55-42(B),

3745-55-43 and 3745-55-45 and Permit Condition B.39.

- c) The Permittee must revise the closure cost estimate and post-closure cost estimate whenever there is a change in the facility's Closure Plan and/or Post-Closure Plan that increases the cost of closure, as required by OAC Rules 3745-55-42(C) and 3745-55-44(C).
- d) The Permittee must submit to the Ohio EPA and keep at the facility the latest closure cost estimate and post-closure cost estimate as required by OAC Rules 3745-55-42(D) and 3745-55-44(D).

B.37. Financial Assurance for Facility Closure and Post-Closure

The Permittee shall maintain continuous compliance with OAC Rules 3745-55-43, 55-45 and/or 55-46 and provide documentation of financial assurance, which meets the requirements of OAC Rule 3745-55-51, in at least the amount of the cost estimates required by Permit Condition B.36. Changes in financial assurance mechanisms must be approved by the Director pursuant to OAC Rule 3745-55-43.

B.38. Liability Requirements
OAC Rule 3745-55-47

The Permittee shall maintain continuous compliance with the requirement of OAC Rule 3745-55-47 and the documentation of liability by providing liability coverage which meets the requirements of OAC Rule 3745-55-51 for sudden accidental occurrences in the amount required by the applicable rules, exclusive of the legal defense costs.

The Permittee also shall demonstrate compliance with OAC Rule 3745-55-47(B) by maintaining liability coverage for nonsudden accidental occurrences in the amount of at least \$3 million per occurrence, with an annual aggregate of at least \$6 million, exclusive of legal defense costs.

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

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

B.40. Reserved.

MODULE C - RESERVED

MODULE D - RESERVED

OHIO EPA D/HWM

JUN 20 2003

MODULE E – CORRECTIVE ACTION REQUIREMENTS

E. Corrective Action Summary

The United States Environmental Protection Agency (U.S. EPA) issued BP Oil Company (BP) a hazardous waste permit for the Lima Refinery on June 28, 1989. As a condition of this permit, U.S. EPA required completion of corrective action for the release of hazardous waste and hazardous waste constituents from solid waste management units (SWMUs) and SWMU groups identified in the permit.

The Permittee submitted a draft RCRA Facility Investigation (RFI) Workplan to U.S. EPA during March 1990 and the final approval for the RFI Workplan was granted on August 7, 1997.

The Phase I RFI was conducted during August and September 1997. The Phase I Report and Phase II Workplan were submitted to U.S. EPA on January 15, 1999. On November 29, 1999, U.S. EPA granted approval of the Phase II RFI Workplan. BP notified the Agencies of their intent to commence Phase II RFI Workplan field activities on December 6, 1999. A Draft Phase II Report, Human Health Risk Assessment, and Detailed Ecological Risk Assessment were submitted on April 3, 2001. On October 24, 2001, U.S. EPA issued final approval of the RFI report. On the same date, U.S. EPA issued a conditional approval of a Corrective Measures Study (CMS). A Final CMS was submitted on November 16, 2001 and approved on December 12, 2001.

On December 31, 2001, U.S. EPA gave public notice of its intent to modify BP's Federal RCRA permit to incorporate Corrective Measures. A draft Corrective Measures Implementation Conceptual Work Plan (CMICWP) and draft Performance Based Ground Water Monitoring Plan (PBGWMP) dated March 2002 were conditionally approved by U.S. EPA on April 19, 2002. On April 24, 2002, U.S. EPA issued a final modification to BP's federal permit requiring implementation of Corrective Measures.

As part of the Corrective Measures, BP implemented deed restrictions on June 7, 2002, and submitted the documents to U.S. EPA. U.S. EPA approved the final CMICWP/PBGWMP on August 16, 2002. A table listing all of the SWMUs, Areas of Concern (AOCs), remedies and dates approved can be found in Attachment 3.

The transition of the corrective action program from the U.S. EPA to Ohio EPA occurred on June 20, 2003. Ohio EPA has assumed the oversight role for Corrective Action at the facility. Corrective action is complete at the site except for some on-going operations and maintenance activities. In addition, Area 3 maintains a Technical Impracticability Demonstration that must be updated every five years for its corrective measures.

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

In accordance with OAC Rule 3745-50-10 "waste management unit" means any discernable unit at which solid waste, hazardous waste, infectious waste (as those terms are defined in ORC Chapter 3734), construction and demolition debris (as defined in ORC Chapter 3714), industrial waste, or other waste (as those terms are defined in ORC Chapter 6111) has been placed at any time, irrespective of whether the unit was intended for the management of waste or hazardous waste. Such units include any area at a Facility at which wastes have been routinely and systematically released. As used in this permit, the term "waste management unit" shall be consistent with and equivalent to the term "solid waste management unit" as that term is defined in Section 3004(u) of RCRA. For the purpose of Corrective Action, facility is defined as all contiguous property under the control of the owner or operator seeking a permit under Subtitle C of RCRA. The terms Interim Measure (IM), RCRA Facility Investigation (RFI), Corrective Measures Study (CMS) and Corrective Measure Implementation (CMI) are defined in U.S. EPA's Corrective Action Plan (CAP) (OSWER Directive 9902.3-2A, May 1994.)

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

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

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

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

The units or groups of units which were investigated during the Phase 1 RFI are listed in Attachment 2.

- 1) The units or groups of units which were identified during the course of Corrective Action are listed in Attachment 3. The following units from Attachment 3 have completed their corrective measures remedy and require on-going/future operations and maintenance activities:

- SWMU 1 – Land Treatment Unit
- SWMU 7 – L-5 Landfill
- SWMU 8 – L-6 Landfill
- SWMU 46 – Old Primary Pond
- SWMU 47 – Primary Pond
- SWMU 57 – North Ditch
- SWMU 58 – Tank 231
- SWMU 62 – E-Pond
- SWMU 67 – Former Coke Pile
- SWMU Group A – Old Drum Storage Area (SWMU 3) and L-3 Waste Pile (SWMU 5)
- Area 3 - SWMU Groups B, E, and F

Ottawa River – Area of Concern
Zurmehly Creek – Area of Concern

E.4. Reserved

E.5. RFI
OAC Rule 3745-54-101

The Permittee conducted an RFI to thoroughly evaluate the nature and extent of the release of hazardous wastes and hazardous constituents from all applicable WMUs identified in Condition E.3.

a) RFI Workplan

In case of a newly discovered waste management unit, the Permittee shall submit a written RFI Workplan to Ohio EPA on a time frame established by Ohio EPA.

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

b) RFI Implementation

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

c) RFI Final Report

Within sixty (60) days after the completion of the RFI, the Permittee shall submit an RFI Final Report to Ohio EPA. The RFI Final Report shall describe the procedures, methods, and results of the RFI. The Final Report must contain adequate information to support further decisions concerning corrective action at the Facility.

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

E.6. Interim Measures (IM)

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

E.7. Determination of No Further Action

(a) Permit Modification

Based on the results of the completed RFI or other relevant information, the Permittee may submit an application to Ohio EPA for a Class 3 permit modification under OAC Rule 3745-50-51 to terminate specific Corrective Action tasks which are enumerated throughout Section E of the permit. Other Corrective Action tasks identified in Section E will remain in effect. This permit modification application must conclusively demonstrate that there are no releases of hazardous waste or constituents from SWMUs at the Facility that pose an unacceptable risk to human health and the environment.

If, based upon review of the Permittee's request for a permit modification, the results of the completed RFI, and other information, including comments received during the initial sixty (60) day public comment period required for Class 3 permit modifications, Ohio EPA determines that releases or suspected releases which were investigated either are nonexistent or do not

pose an unacceptable risk to human health and the environment, Ohio EPA will approve the requested modification.

(b) Periodic Monitoring

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

(c) Further Investigations

A determination of no further action shall not preclude Ohio EPA from requiring further investigations, studies, or remediation at a later date, if new information or subsequent analysis indicates that a release or potential release from a WMU at the Facility may pose an unacceptable risk to human health or the environment. In such a case, Ohio EPA shall initiate a modification to the terms of the permit to rescind the determination made in accordance with Attachment 3. Additionally, in the event Ohio EPA determines that there is insufficient information on which to base a determination, the Permittee, upon notification, is required to develop a Work Plan and upon Ohio EPA approval of that Work Plan, perform additional investigations as needed.

E.8. Corrective Measures Study (CMS)

In the case of a newly discovered waste management unit, if Ohio EPA determines, based on the results of the RFI and any other relevant information, that corrective measures are necessary, Ohio EPA will notify the Permittee in writing that the Permittee shall conduct a CMS either as described below or as described in Ohio EPA's notification to the Permittee. The purpose of the CMS will be to develop and evaluate the corrective action alternative(s) and to outline one or more alternative corrective measure(s) that will satisfy the performance objectives specified in Permit Condition E.9.

a) CMS Workplan

In the case of a newly discovered waste management unit, the Permittee must submit a written CMS Workplan to Ohio EPA within ninety (90) days from the notification by Ohio EPA of the requirement to conduct a CMS.

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

b) CMS Workplan Implementation

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

c) CMS Final Report

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

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

E.9. Corrective Measures Implementation (CMI)

Based on the results of the CMS for a newly discovered waste management unit, the Permittee must implement one or more of the Corrective Measures authorized by Ohio EPA. Ohio EPA will authorize one or more of the Corrective Measures in the CMS, and will notify the Permittee in writing of the decision. Ohio EPA will select a Corrective Measure for implementation based on the following factors. The Corrective Measure selected for implementation must: (1) be protective of human health and the environment; (2) attain media cleanup standards; (3) control the source(s) of releases so as to reduce or eliminate further releases of hazardous waste(s) (including hazardous constituent(s)); and (4) comply with all applicable standards for management of wastes.

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

In authorizing the proposed Corrective Measure(s), Ohio EPA may also consider such other factors as may be presented by site-specific conditions. The Corrective Measure(s) described below are for the SWMUs identified in Condition E.3.

a) Corrective Action Objectives

The Corrective Action objectives the Permittee is required to meet are based on information gathered during previous investigations and are intended to protect human health and the environment. These objectives focus on Upper and Middle Sand ground water, surface soil and subsurface soil contamination identified at the facility. The general objectives are as follows:

1) Establish Media Cleanup Standards for Points of Compliance

The first general corrective action objective involves establishing Media Cleanup Standards (MCSs) for the Point of Compliance (POC) specified for the contaminated media. MCSs were established for the media exhibiting exceedances of action levels. The MCSs and POCs for these media are described below.

i) Media Cleanup Standards

Based on the results from the Phase II RCRA Facility Investigation (RFI), Human Health Risk Assessment (HHRA), and Detailed Ecological Risk Assessment (DERA) completed in 2001, action levels were developed during the CMS to help determine the specific areas of the facility that require corrective measures. For a CMS, an action level is defined as a medium-specific, health- and environment-based contaminant concentration determined to be protective of human health and the environment. Table 1 presents the criteria upon which the action levels for each

medium were based. Tables 2 and 3 present the MCSs for soil and ground water, respectively.

Table 1 – Action Level Criteria for Each Medium

Medium	Action Level Criteria
Ground Water	<ul style="list-style-type: none"> • U.S. EPA MCLs • Risk-based action levels developed based on HHRA results
Soil	<ul style="list-style-type: none"> • U.S. EPA Region 9 industrial Preliminary Remediation Goals (PRGs) • Risk-based action levels developed based on HHRA results

Table 2 – MCSs for Soil

COC	MCS (milligram per kilogram)
Benzene	1.5
Ethylbenzene	230
Toluene	520
Xylene	210
Benzo(a)pyrene	0.29
Benzo(a)anthracene	2.9
Benzo(b)fluoranthene	2.9
Indeno(1,2,3-cd)pyrene	2.9
Lead	750

Table 3 – MCSs for Ground Water

Table 3 – MCSs for Ground Water	
COC	MCS (milligram per liter)
Volatile Organic Compounds	
Benzene	0.005
Carbon disulfide	1.0
Chlorobenzene	0.1
Chloroethane ^a	0.0046
Chloroform	0.16
1,2-Dichloroethane	0.005
1,1-Dichloroethylene	0.007
1,2-Dichloropropane ^a	0.005
1,4-Dioxane	0.0061
Ethylbenzene	0.7
Methyl ethyl ketone	1.9
Styrene	0.1
Toluene	1.0
1,1,1-Trichloroethane	0.2
Trichloroethene	0.005
Tetrachloroethene	0.005
Vinyl chloride ^a	0.002
Xylenes (total)	10.0
Semivolatile Organic Compounds	
Acenaphthene	0.37
Anthracene	1.8
Benzo(a)anthracene	0.000092
Benzo(b)fluoranthene	0.000095

Table 3 – MCSs for Ground Water	
COC	MCS (milligram per liter)
Benzo(k)fluoranthene	0.000092
Benzo(a)pyrene	0.0002
Bis(2-ethylhexyl)phthalate	0.006
Chrysene	0.0092
Dibenz(a,h)anthracene	0.000097
Di-n-butyl phthalate	3.6
1,2-Dichlorobenzene	0.6
1,3-Dichlorobenzene	0.0055
1,4-Dichlorobenzene	0.075
Diethyl phthalate	29
2,4-Dimethylphenol	0.73
Dimethyl phthalate	360
2,4-Dinitrophenol	0.073
Fluoranthene	1.5
Fluorene	0.24
Indeno(1,2,3-cd)pyrene	0.000092
Methyl tertiary butyl ether	0.02
Naphthalene	0.0062
4-Nitrophenol	0.29
Phenanthrene	0.00075
Phenol	22.0
Pyrene	0.18
Pyridine	0.036
Metals	
Antimony	0.006
Arsenic	0.05
Barium	2.0

Table 3 – MCSs for Ground Water	
COC	MCS (milligram per liter)
Beryllium	0.004
Cadmium	0.005
Chromium (total)	0.1
Cobalt	2.2
Cyanide	0.2
Lead	0.015
Mercury	0.002
Nickel	0.73
Selenium	0.05
Silver	0.18
Thallium ^b	0.002
Vanadium	0.26
Zinc	11.0

Notes: ^a COC for SWMU 63 only
^b COC for SWMUs 62 and 63 only

ii) Points of Compliance (POC)

A POC is a location at which an MCS must be met. For soil, the POC is the lateral extent of the boundary of the SWMU, SWMU Group, Area of Concern, or SWMU Group Area and vertical extent where COCs are present at concentrations equal to or exceeding the MCSs or where post-remedial risk evaluations show that COCs pose a significant risk above Ohio EPA's acceptable risk goal of 10^{-5} or a total hazard index greater than 1.

-
- 2) After implementing corrective measures for soils, samples will be collected to determine if Constituents of Concern (COCs) are present at levels above the MCSs. If COCs are present at levels above the MCSs, a post-remedial risk evaluation will be conducted. If the post-remedial risk evaluation shows that the COCs that are present at levels above the MCSs do not pose a significant risk above Ohio EPA's acceptable risk level of 10^{-5} or Hazard Index of less than 1, then no further corrective measures will be implemented. However, if the post-remedial risk evaluation shows that the COCs that are present at levels above the MCSs do pose a significant risk above Ohio EPA's acceptable risk level of 10^{-5} or Hazard Index greater than 1, then further corrective measures will be implemented.

Ohio EPA DMWM JAN 24 2013

b) Reserved

Ohio EPA DMWM JAN 24 2013

This page intentionally left blank

This page intentionally left blank

c) Specific Remedies

Specific remedies for individual SWMUs, SWMU groups, and areas at the facility are described in Attachment 3. These remedies were implemented in accordance with the CMICWP approved by U.S. EPA and the Terms and Conditions of this Permit.

This page intentionally left blank

This page intentionally left blank

Ohio EPA DMWM JAN 24 2013

This page intentionally left blank

d) Ground Water Monitoring

Reserved

e) Progress Reports

The Permittee shall submit monthly progress reports to Ohio EPA by the 12th of the month.

The Permittee must submit inspection reports to Ohio EPA annually for the L-5 Landfill (SWMU 7) and SWMU Group F in accordance with the Operation and Maintenance (O&M) Plans in the approved Construction Completion Reports.

The Permittee must reassess the technical impracticability (TI) of light non-aqueous phase liquid (LNAPL) remediation at Area 3 in five-year intervals to determine if advances in technology would allow removal of LNAPL, and report the reassessment results to Ohio EPA. The first report was submitted on October 30, 2007.

f) Corrective Measures Completion Report

Within forty-five (45) days of completion of corrective measures implementation, the Permittee shall submit to Ohio EPA a Corrective Measures (CM) Completion Report and Operation and Maintenance (O&M) Plan.

- 1) If necessary, Ohio EPA shall provide written comments on the CM Completion Report and O&M Plan to the Permittee.
- 2) Within forty-five (45) days of receipt of Ohio EPA's comments, the Permittee shall submit either an amended or new CM Completion Report and O&M Plan.
- 3) Ohio EPA shall approve or modify and approve, in writing, the amended or new CM Completion Report and O&M Plan. The CM Completion Report and O&M Plan, as approved or as modified and

approved, shall be incorporated into this permit and become an enforceable condition of this permit. Subsequent changes to the approved CM Completion Report and O&M Plan must be authorized by Ohio EPA.

g) Permit Modification

In case of a newly discovered waste management unit that requires corrective measures, Ohio EPA will initiate a permit modification, as provided by OAC Rule 3745-50-51 to require implementation of the corrective measure(s) authorized.

The Permittee must not implement the corrective measure until the permit is modified pursuant to OAC Rule 3745-50-51.

h) Financial Assurance
OAC Rule 3745-54-101

Within 45 days after receiving approval of the CMI, the Permittee must provide financial assurance in the amount necessary to implement the corrective measure(s) as required by OAC Rule 3745-54-101 (B) and (C).

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

a) General Information

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

- i) The location of the unit on the site topographic map;
- ii) Designation of the type of unit;
- iii) General dimensions and structural description (supply any available drawings);

Ohio EPA DMWM JAN 24 2013

- iv) When the unit was operated; and
 - v) Specification of all waste(s) that have been managed at the unit.
- b) Release Information

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

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

If Ohio EPA determines that an RFI is required for newly identified WMUs, the Permittee must submit a written RCRA Facility Investigation Workplan to Ohio EPA upon a time frame established in written notification by Ohio EPA in accordance with Permit Condition E.5. This determination will be made based on the information submitted in accordance with Permit Condition E.10.

Further investigations or corrective measures will be established by Ohio EPA.

The Permittee must make such submittal in accordance with time frames established by Ohio EPA.

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

After completing Corrective Action as necessary to protect human health and the environment for all releases of hazardous wastes or hazardous constituents from any WMUs at the Facility, the Permittee must submit a Corrective Measures Completion of Work (CMCW) Report. The CMCW Report must document that Corrective Action construction is complete, cleanup objectives and standards have been met, and any releases of hazardous waste or constituents no longer pose an unacceptable risk to human health and the environment. The CMCW Report may be submitted for any part of the Facility for which corrective measures are complete, or for the entire Facility. The CMCW Report must be submitted as a request for permit modification pursuant to OAC Rule 3745-50-51.

Ohio EPA DMWM JAN 24 2013

E.13 Documents Requiring Professional Engineer Stamp
ORC Section 4733.01

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

Final Interim Measures Report

Corrective Measures Final Design

Corrective Measures Construction Completion Report

Corrective Measures Attainment of Groundwater Performance Standards Report

Corrective Measures Completion of Work Report

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

5/6/10 CIA mod

MODULE F – GROUND WATER DETECTION MONITORING

F.1. Module Highlights

This module addresses the ground water monitoring program associated with the Primary Pond Waste Consolidation Area (PPWCA) at the Lima Refinery. The PPWCA is being monitored as a landfill with post-closure care under the PPWCA Post-Closure Ground-Water Detection Monitoring Plan (PCGWDMP), dated March 12, 2010, which was approved by Ohio EPA on May 5, 2010. The PCGWDMP is hereby incorporated into the approved permit application.

The Permittee's ground water monitoring system consists of three (3) monitoring wells and one piezometer which are screened in the Middle Sand. The Middle Sand is comprised primarily of sand and gravel, fine sand and considerable amounts of clay and thin lenses of silt and sand with considerable clay. The composition is typical of a unit deposited by a braided stream flowing before a glacial front and is Wisconsinian in age. The monitoring wells consist of one background well: FW-03S(a), two downgradient wells: FW-13S and FW-18S, and one piezometers, FW-15S.

F.2. Well Location, Installation and Construction OAC Rule 3745-54-97

The Permittee shall install and maintain a ground water monitoring system as specified below:

- a) The Permittee shall maintain, as part of a Ground Water Detection Monitoring System complying with OAC Rules 3745-54-97(A) and (B), the ground water monitoring wells on the map in Figure 2 of the Post-Closure Ground-Water Detection Monitoring Plan (PCGWDMP) and in conformance with the following list:

Unit	Background Wells	Point of Compliance Wells
Primary Pond Waste Consolidation Area	FW-03S(a)	FW-13S FW-18S

The ground water monitoring system must: yield samples in upgradient wells that represent the quality of the background ground water unaffected by leakage from any regulated unit(s), and in downgradient wells yield samples that represent the quality of water passing the point of compliance. The number and location of monitoring wells must be sufficient to identify and

define all logical release pathways to the uppermost aquifer from the regulated units based on site-specific hydrogeologic characterization.

- b) The Permittee shall maintain the monitoring wells identified in Permit Condition F.2(a), in accordance with the detailed plans and specifications presented in the PCGWDMP.
- c) The Permittee shall remove or replace any monitoring well identified in Permit Condition F.2(a) in accordance with the Appendix to OAC Rule 3745-50-51 permit modification process. Each change must be accompanied by a revised map as specified in Figure 2 of the PCGWDMP for Permit Condition F.2(a).
- d) All wells removed or replaced in accordance with Permit Condition F.2(c) shall be plugged and abandoned in accordance with the document entitled "State of Ohio Technical Guidance for Sealing Unused Wells" (State Coordinating Committee on Ground Water, 1996).
- e) Whenever any of the wells specified in Permit Condition F.2(a) are replaced, the Permittee must demonstrate to Ohio EPA that the ground water quality at the replacement well meets the criteria in Permit Condition F.2(a) within a two year period of the date of replacement using means appropriate to the reason for replacement.

F.3. Indicator Parameters and Monitoring Constituents
OAC Rule 3745-54-98

- a) The Permittee shall monitor all wells listed in Permit Condition F.2(a) for the following parameters and constituents:

5/6/10 CIA mod

Parameter/Constituent	Established Background Concentrations Milligrams per liter (mg/l)
Antimony	SL
Arsenic	SL
Barium	SL
Beryllium	SL
Cadmium	SL
Chromium	SL
Cobalt	SL
Lead	SL
Mercury	SL
Nickel	SL
Selenium	SL
Vanadium	SL
Benzene	0.001
Carbon disulfide	0.001
Chlorobenzene	0.001
Chloroform	0.001
1,2-Dichloroethane	0.001
Ethyl benzene	0.001
Ethylene dibromide	0.00003
Methyl ethyl ketone (2-butanone)	0.010
Styrene	0.001
Toluene	0.001
Xylene	0.002
Anthracene ¹	0.010
Benzenethiol ¹	0.010
Benzo(a)anthracene ¹	0.010
Benzo(a)pyrene ¹	0.0002
Benzo(b)fluoranthrene ¹	0.010
Benzo(k)fluoranthrene ¹	0.010
Bis (2-ethylhexyl) phthalate ¹	0.010
Butyl benzyl phthalate ¹	0.010
Chrysene ¹	0.010

¹ Samples will only be collected and analyzed for these semi-volatile organic compounds (SVOCs) on an annual basis

SL – Statistical Limit listed in PCGWDMF Appendix B.

Parameter/Constituent	Established Background Concentrations Milligrams per liter (mg/l)
Dibenz(a,j)acridine ¹	0.050
Dibenz(a,h)anthracene ¹	0.010
1,2-Dichlorobenzene ¹	0.010
1,3-Dichlorobenzene ¹	0.010
1,4-Dichlorobenzene ¹	0.010
Diethyl phthalate ¹	0.010
7,12-Dimethylbenz(a)anthracene ¹	0.020
2,4-Dimethylphenol ¹	0.010
Dimethyl phthalate ¹	0.010
Di(n)butyl phthalate ¹	0.010
2,4-Dinitrophenol ¹	0.050
Di(n)octyl phthalate ¹	0.010
1,4-Dioxane ¹	0.010
Fluoranthene ¹	0.010
Indene ¹	0.020
1-Methyl naphthalene ¹	0.010
2-Methylphenol ¹	0.010
4-Methylphenol/3-Methylphenol ¹	0.020
6-Methyl chrysene ¹	0.020
Naphthalene ¹	0.010
4-Nitrophenol ¹	0.050
Phenanthrene ¹	0.010
Phenol ¹	0.010
Pyrene ¹	0.010
Pyridine ¹	0.020
Quinoline ¹	0.010
¹ Samples will only be collected and analyzed for these semi-volatile organic compounds (SVOCs) on an annual basis. TBD - To be determined upon the collection of an adequate amount of background data.	

b) For those parameters and constituents in Permit Condition F.3(a), for which no background values are established at the time the Permit is issued, the Permittee shall establish background values in accordance with the following procedures.

i) During each sampling event, the Permittee shall take a minimum of one sample from each well (background and compliance point wells)

OHIO EPA CHWM

JUN 20 2003

- and analyze for each parameter or constituent specified in the permit, and
- ii) Background ground water quality for a monitoring parameter or constituent shall be based on data averaged from the appropriate number of sampling events of the background wells in order to provide at least eight background data points over a two year period. Additional sampling for the establishment of background ground water quality beyond the two year period will be allowed if adequately justified and approved by the Ohio EPA; or
 - iii) If an intra-well statistical method is to be used, then the Permittee shall collect at least eight data points from each well (background and compliance point wells).
- c) Background data collected in accordance with Permit Condition F.3(b) and OAC Rule 3745-54-97(G), for the establishment of background concentrations developed in accordance with OAC Rules 3745-54-97(H) and (I), may be updated in accordance with the following requirements:
- i) Background is not updated with less than 4 new data points at any one time.
 - ii) The new background (previous background data plus new background data) should be checked for slowly increasing trends. If a slowly increasing trend is identified then the background should not be updated unless concurrence from Ohio EPA is received that it has been adequately demonstrated that the increasing trend is not the result of a release from the regulated unit.
 - iii) Background updates should be accumulative and not a moving window, unless a trend is identified in the background data. As required in Permit Condition F.3(c)(ii), the identified trends would have to be adequately demonstrated to not be the result of a release from the regulated unit otherwise the background update would not be permitted.
 - iv) When a trend in background data has been identified and it has been adequately demonstrated to not be the result of a release from the regulated unit, then a moving window background should be used.

The size of the moving window will be dependent upon the rate of change and the best balance between background size and variance.

F.4. Sampling and Analysis Procedures
OAC Rule 3745-54-97

The Permittee shall use the following techniques and procedures when obtaining and analyzing samples from the ground water monitoring wells described in Permit Condition F.2.:

- a) Ground water elevations shall be measured using the techniques described in Sections 3.2 Sample Collection, 3.2.1 Procedures Prior to Sampling, and 3.2.1.1 Measurement of Ground-Water Elevations of the PCGWDMP.
- b) The well shall be checked for the presence of immiscible layers prior to purging in any monitoring wells where dissolved concentrations of any site-specific parameter indicate that immiscible layers could be present, using the methods described in Sections 3.2 Sample Collection, 3.2.1 Procedures Prior to Sampling, and 3.2.1.2 Detection of Immiscible Layers of the PCGWDMP.
- c) Samples shall be collected and handled (including well evacuation, sample withdrawal, preservation, containerization, filtration and shipment) using the techniques and equipment described in Sections 3.2 Sample Collection, 3.2.2 Sampling Procedures, 3.2.2.1 Sample Equipment, 3.2.2.3 Well Evacuation, 3.2.2.5 Sample Withdrawal and Filtration, and 3.2.2.6 Sample Containers, Preservation, and Holding Times of the PCGWDMP.
- d) Field analysis shall be performed using instruments, procedures, and forms described in the PCGWDMP. Instruments shall be calibrated as described in Sections 3.2 Sample Collection, 3.2.2 Sampling Procedures, and 3.2.2.7 Field Analysis of the PCGWDMP.
- e) Sampling equipment shall be decontaminated using techniques described in Sections 3.2 Sample Collection, 3.2.2 Sampling Procedures, and 3.2.2.2 Decontamination of Field Equipment of the PCGWDMP.
- f) Purge water shall be disposed of in accordance with procedures described in Sections 3.2 Sample Collection, 3.2.2 Sampling Procedures, and 3.2.2.4 Disposal of Purge Water of the PCGWDMP.

- g) Laboratory analytical methods, detection limits and sample holding time shall be in accordance with techniques described in Sections 3.3 Sample Parameters and Schedule, 3.3.1 Indicator Parameters, 3.3.2 Annual Parameters, 3.3.3 Background Data Collection Schedule, and 3.3.4 Detection Monitoring Schedule of the PCGWDMP as updated per Permit Condition F.7(f).
- h) Quality assurance, including field/lab/equipment blanks, duplicate samples and identification of potential interferences, shall be in accordance with the methods described in Sections 3.3 Sample Parameters and Schedule, 3.3.6 Quality Assurance/Quality Control, 3.3.6.1 Field QA/QC and 3.3.6.2 Laboratory QA/QC of the PCGWDMP.
- i) Chain of custody procedures, including standardized field tracking reporting forms, and sample labels, shall be in accordance with Sections 3.3 Sample Parameters and Schedules, and 3.3.5 Chain-of-Custody Procedures of the PCGWDMP.

F.5. Elevation of the Ground Water Surface

- a) The Permittee shall determine the elevation of the ground water surface at each well each time the ground water is sampled, in accordance with Permit Condition F.7(b).
- b) The Permittee shall record the total depth of any wells installed in accordance with Permit Condition F.2 and the surveyed elevation of the top of casing, ground surface and/or apron elevation, and elevation of the protective casing of the monitoring well(s) within thirty (30) days of the date of installation (with as-built drawings).

F.6. Statistical Procedures

When evaluating the monitoring results in accordance with Permit Condition F.7., the Permittee shall use the following procedures to identify statistically significant evidence of contamination:

- a) The Permittee shall use an appropriate statistical procedure for determining whether a statistically significant change has occurred. The statistical procedure shall be determined in accordance with the most recently finalized U.S. EPA statistical guidance document. The Permittee may follow the flow

chart for statistical analysis decision making as included in the ASTM guidance document number D6312-98 entitled: "Standard Guide for Developing Appropriate Statistical Approaches for Ground-Water Detection Monitoring Programs." The ASTM guidance also may be followed, where deemed appropriate by the Ohio EPA.

Any statistical method that is chosen must comply with the following performance standards:

- i) The statistical method shall utilize a sample size large enough to ensure with reasonable confidence that a contaminant release to the ground water from the facility will be detected.
- ii) The statistical procedure must be protective of human health and the environment and provide reasonable confidence that migration of hazardous constituents from a regulated unit into and through the aquifer will be indicated.
- iii) The statistical method must be used in evaluating ground water monitoring data for each hazardous constituent specified in Permit Condition F.3(a).
- iv) The statistical method must be appropriate for the distribution of the data used to establish background values or concentration limits. If the distribution for the constituents differs from one another, more than one statistical method may be needed.
- v) The statistical method must provide a reasonable balance between the probability of falsely identifying a non-contaminating unit and the probability of failing to identify a contaminating regulated unit.
- vi) The statistical method shall account for data below the limit of detection with one or more statistical procedures that are protective of human health and the environment. Any practical quantitation limit (PQL) approved in the permit that is used in the statistical method shall be the lowest concentration level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions that are available to the facility using the methods outlined in the most recent version of SW-846.

- vii) If necessary, the statistical method shall include procedures to control or correct for seasonal and spatial variability as well as temporal correlation in the data.
- b) The Permittee shall choose and submit to the Ohio EPA the appropriate statistical method within ninety (90) days of the receipt of the last background sampling event data.

F.7. Monitoring Program and Data Evaluation

The Permittee shall establish and implement a detection ground water monitoring program that will determine, with reasonable confidence, whether any hazardous constituents have entered the ground water as a result of activities at the unit/area covered by the Part B Permit. The Permittee shall determine ground water quality as follows:

- a) The Permittee shall collect, preserve, and analyze samples pursuant to Permit Condition F.4.
- b) The Permittee shall determine ground water quality at each monitoring well (See Figure 1 attached to this module) semiannually during the post-closure care period of the PPWCA.

The Permittee shall express the ground water quality at each monitoring well in a form necessary for the determination of statistically significant increases.

- c) The Permittee shall determine the ground water flow rate and direction in the uppermost aquifer at least annually.
- d) The Permittee shall determine whether there are any statistically significant increases over the background values for all parameters identified in Permit Condition F.3(a) each time ground water quality is determined at the compliance point. In determining whether such increases have occurred, the Permittee must compare the ground water quality at each monitoring well specified in Permit Condition F.2(a) to the background ground water quality specified in Permit Condition F.3(a), in accordance with the statistical procedures specified in Permit Condition F.6. If there is a confirmed detection of any of the parameters identified in Permit Condition F.3(a), then the Permittee shall take the response actions and fulfill the requirements of Permit Condition F.10 regarding statistical evidence of contamination.

- e) The Permittee shall perform the evaluations described in Permit Condition F.7(d) within ninety (90) days after completion of sampling.

F.8. Recordkeeping and Reporting
OAC Rule 3745-54-97(J) and

Operating Record

OAC Rules 3745-54-73(B)(5)&(6), 3745-54-97(J), and 3745-54-98(C)

- a) Ohio EPA may request a copy of the full QA/QC report for a particular sampling event if circumstances warrant, but in general, QA/QC data will not be required except as described below. The Permittee shall enter all of the following information obtained in accordance with Permit Condition F.7 in the operating record as required by OAC Rules 3745-54-73(B)(5)&(6), 3745-54-97(J) and 3745-54-98(C):
 - i) The laboratory results from each of the wells and their associated qualifiers, including the laboratory sheets for the full volatile and semi-volatile analyses (must include method codes, detection limits and units of measurement);
 - ii) The date each well was sampled (tabulated);
 - iii) The date, time, and identification of all blanks and duplicates;
 - iv) Any field log documentation of deviation from the procedures in the PCGWDMP, including documentation of parameter omissions during the sampling event;
 - v) The date the Permittee received the results from the laboratory;
 - vi) The date the Permittee completed their review of the analytical laboratory's verification of the accuracy and precision of the analytical data and determined its quality.
 - vii) The results of the data validation review per F.8(a)(vi) including: report completeness, chain of custody, sample receipt form, signed statement of validity, technical holding time review, data qualifiers including their definitions, dilutions, blank data, spikes, spike recovery

- %, surrogate recovery, and an explanation of any rejected results consistent with the U.S. EPA and Ohio EPA guidelines for data review;
- viii) Results of all blanks and duplicates (trip, field, equipment and method);
 - ix) Results of the field parameters;
 - x) All chains of custody;
 - xi) The date the statistical evaluation was completed;
 - xii) The statistical evaluation of the data according to the statistical tests(s) that the Director has specified (must include all computations and results of statistical tests);
 - xiii) Any changes in well status (i.e., going from unaffected to affected status and vice versa);
 - xiv) Ground water surface elevations taken at the time of sampling for each well as required by OAC Rule 3745-54-73(B)(6);
 - xv) Data and results of the annual determination of the ground water flow rate and direction as required by OAC Rule 3745-54-73(B)(6); and
 - xvi) The results of the last three years of all inspections required under OAC Rule 3745-54-15(D) related to ground water monitoring and equipment, as required under OAC Rule 3745-54-73(B)(5).
- b) The established background values and the computations necessary to determine background values must be included in the operating record and submitted to Ohio EPA within ninety (90) days of the completion of the last background sampling event.
- c) The Permittee must submit an annual report to the Director by March 1st or first business day thereafter if this falls on a weekend. The annual reports must reference the titles and dates of any other periodic reports required by the Permit or any updates to those reports (for example, due to confirmation sampling, comments by Ohio EPA, etc.), but generally do not need to include duplicates of hard copies previously submitted. The annual reports must

OHIO EPA DHWM

JUN 20 2003

include, at a minimum, the analytical results required by Permit Condition F.7(b), the ground water elevation data required by Permit Conditions F.5(a) and F.7(c), the results of the initial statistical analyses required by Permit Condition F.7(d), and the results of the evaluations required by Permit Condition F.7(e). In addition, a copy on disk of all ground water and blank data must be submitted electronically in the format supplied by the Director. A hard copy of well-specific information [location (latitude and longitude), depth, construction, etc.] for any new/replacement wells, and any other information specified in the instructions for the annual report but not addressed in this Condition, must be submitted in accordance with the schedule stated in Permit Condition F.8(d) as required by OAC Rules 3745-54-75 and 3745-54-97(J).

d) Other Reports

The Permittee shall comply with any reporting requirements that become necessary under Permit Condition F.10 in accordance with the schedule in that Condition and as required by OAC Rule 3745-54-77(C). If any of these dates falls on a weekend, the reports will be due no later than the next business day. Resampling reports must include the same types of information as the initial reports pertaining only to the resampled well(s).

It is recommended that the Permittee submit the analytical results required by Permit Conditions F.7(b) and F.7(c) and the results of the initial statistical analyses required by Permit Condition F.7(d), in accordance with the following schedule and as required by OAC Rule 3745-54-77(C):

<i>Samples to be Collected During the Preceding Months of:</i>	<i>Results Due to the Director By:</i>
<p>April – May</p> <p>October – November</p>	<p>Within 90 days of completion of the sampling event</p>

F.9. Assurance of Compliance

The Permittee shall assure the Director that the ground water monitoring program will ensure the earliest possible detection of contamination leakage from the

regulated units, that any contamination leakage would be characterized, and that the need for further action will be determined.

F.10. Special Requirements if Significant Increases Occur in Values for Parameters or Constituents

If the Permittee has determined a statistically significant increase in any of the parameters or constituents identified in Permit Condition F.3(a), in accordance with the statistical procedures in Permit Conditions F.6. and F.7., the Permittee must:

- a) Notify the Director, in writing, within seven (7) days of that determination. The notification must indicate what parameters or constituents have shown statistically significant increases and the corresponding analytical results.
- b) Within 30 days sample the ground water in the background well and the affected well and determine the concentration of all constituents identified in Tables 5 and 6 of the PCGWDMP not analyzed during the most recent event at which the statistically significant increase occurred [OAC Rule 3745-54-98(G)(2)].
- c) For any additional compounds detected under Permit Condition F.10(b), the Permittee may resample within one month and repeat the analysis for those compounds detected. If the results of the second analysis confirm the initial results, then these constituents, in addition to those noted in Permit Condition F.10(a), will form the basis for compliance monitoring. If the Permittee does not resample, or if the Permittee analyzed for all Table 5 and 6 site-specific indicator parameters during the most recent event at which the statistically significant increase occurred, then those detected constituents will form the basis for compliance monitoring. [OAC Rule 3745-54-98(G)(3)]

[Note: Per Permit Condition F.3(a), the facility has replaced the ground-water hazardous constituent list included in the appendix to OAC Rule 3745-54-98 with a site-specific indicator parameter list (Skinner List) of refinery-related constituents, which will be analyzed annually. In addition, all site-specific parameters, except the semi-volatile organic compounds included on Tables 5 and 6 of the monitoring plan, will be analyzed semiannually.]

- d) Within ninety (90) days of determining a statistically significant increase, submit, to the Director, an application for a permit modification to establish

a compliance monitoring program. The application must include the following information:

- i) An identification of the concentration of each Skinner List (found in Table 4 of the PCGWDMMP) constituent found in the ground water at each monitoring well at the point of compliance.
- ii) Any proposed changes to the ground water monitoring system at the facility necessary to meet the requirements of compliance monitoring, as described in OAC Rule 3745-54-99.
- iii) Any proposed changes to the monitoring frequency, sampling and analysis procedures, or methods or statistical procedures used at the facility necessary to meet the requirements of compliance monitoring and the Ground Water Protection Standards [OAC Rule 3745-54-92].
- iv) For each hazardous constituent detected at the compliance point, a proposed concentration limit, or a notice of intent to seek an alternate concentration limit (ACL) for a hazardous constituent under OAC Rule

resulted from error in sampling, analysis, or evaluation. In such cases, the Permittee shall:

- i) Notify the Director, in writing, within seven (7) days of determining a statistically significant increase, that he intends to make a demonstration.
- ii) Within ninety (90) days of determining a statistically significant increase, submit a report to the Director which successfully demonstrates that a source other than a regulated unit caused the increase, or that the increase resulted from error in sampling, analysis, or evaluation.
- iii) Within ninety (90) days of determining a statistically significant increase, submit to the Director an application for a permit modification to make any appropriate changes to the detection monitoring program at the facility.
- iv) The Permittee may make this demonstration in addition to, or in lieu of, submitting a permit modification application for a compliance ground water monitoring program under OAC Rule 3745-54-99. However, the same period of ninety (90) days is required for both a successful "Other Source Demonstration" and the submittal of the permit modification application for compliance ground water monitoring. The Permittee is not relieved of the ninety (90) day requirement for a permit modification unless the "Other Source Demonstration" is deemed successful by the Agency prior to the ninety (90) day time limit.
- v) Continue to monitor in accordance with the detection monitoring program at the facility.

F.11. Request for Permit Modification
OAC Rule 3745-54-98(H)

If the Permittee or the Director determines the detection monitoring program no longer satisfies the requirements of the regulations, the Permittee must, within ninety (90) days of the determination, submit the date of that determination and an

application for a permit modification to make any appropriate changes to the program which will satisfy the regulations.

F.12. Compliance Schedule

The Permittee shall, within ninety (90) days of permit journalization, submit an amended PCGWDMP to meet the revisions required by this permit. The submittal of the revised PCGWDMP constitutes a Class 1 permit modification for which the Director's approval is required. The Permittee shall address the following: [The Permittee submitted the amended PCGWDMP, dated September 10, 2003, on September 25, 2003. The amended version addresses each of the items listed below.]

F.2.c) – "... Each change must be accompanied by a revised map as specified on Figure 2 of the PCGWDMP for Permit Condition F.2(a)." This is not stated in the PCGWDMP.

F.3.b)iii) – "If an intra-well statistical method is to be used, then the Permittee shall collect at least eight data points from each well (background and compliance point wells)." The PCGWDMP does not explicitly designate at which monitoring wells the samples will be collected.

F.3.c) – "Background data collected in accordance with Permit Condition F.3(b) and OAC Rule 3745-54-97(G), for the establishment of background concentrations developed in accordance with OAC Rules 3745-54-97(H) and (I), may be updated in accordance with the following requirements: ..." The Permittee stated that the topic of updating the background database would not be discussed in the PCGWDMP and that if the need arose to update the background database, then the Permittee would supply language of its own.

F.6 Statistical Procedures – "When evaluating the monitoring results in accordance with Permit Condition F.7., the Permittee shall use the following procedures to identify statistically significant evidence of contamination: ..." The company has referenced the rules. This section of the permit is almost identical to the rules except for F.6.b) referenced below. In order to remain consistent, the Permittee may want to add this language to the PCGWDMP.

F.6.b) – "The Permittee shall choose and submit to the Ohio EPA the appropriate statistical method within ninety (90) days of the receipt of the last background sampling event data. "The PCGWDMP states one hundred eighty (180) days instead of ninety (90) days. The time period should be changed to ninety (90) days in the PCGWDMP.

F.7.c) – “The Permittee shall determine the ground water flow rate and direction in the uppermost aquifer at least annually.” The PCGWDMP does not explicitly state that this will be done. The plan states that a map will be constructed after each semi-annual event and that the reporting rules will be followed.

F.7.d) This condition discusses how statistical comparisons will be performed and where they will be performed (i.e., at the compliance point). The Permittee again simply states that the rules will be followed.

F.7.e) – “The Permittee shall perform statistical evaluations within ninety (90) days after completion of sampling.”. This is not stated in the PCGWDMP.

F.8. – Recordkeeping and Reporting – The Permittee references the rules for this section of the PCGWDMP, but had formerly agreed to include the language from the permit in the plan per the April 17, 2002 conference call between the Agency and the Permittee.

F.8.b) – This condition requires submission of background values and computations of the values within ninety (90) days of the completion of the last sampling event. This is not explicitly stated in the PCGWDMP. However, the PCGWDMP does reference the reporting rules and state that the Permittee will strive to submit the semi-annual reports in ninety (90) days.

F.10 – “Special Requirements if Significant Increases Occur ...” - The Permittee references the rule, but the language in Permit Condition F.10 has modified some of the requirements of the rule. The Permittee should include all or at least the relevant parts of Permit Condition F.10 (those different from the rule) in the PCGWDMP.

F.11. – Request for Permit Modification – “If the Permittee or the Director determines the detection monitoring program no longer satisfies the requirements of the regulations, the Permittee must, within ninety (90) days of the determination, submit the date of that determination and an application for a permit modification to make any appropriate changes to the program which will satisfy the regulations.” The Permittee did not include this language in the PCGWDMP.

MODULE G – POST-CLOSURE CARE

G.1. Module Highlights

This section is applicable to units with in-place closure approval by Ohio EPA.

Primary and C Ponds (Surface Impoundment)

An above and below-grade surface impoundment used to store liquid wastes. Wastes disposed in the unit included storm and process water. The Primary Pond closed portion of this unit will require thirty (30) years of post-closure ground water monitoring. C Pond will not require post-closure ground water monitoring, as it has been clean closed.

G.2. Unit Identification

The Permittee shall provide post-closure care for the following hazardous waste management unit as found in this Permit and OAC Chapter 55, subject to the terms and conditions of this permit:

Type of Waste Unit	Unit No. or Other Designation	Description of Wastes Contained	Hazardous Waste No.
Surface Impoundment	Primary Pond	Petroleum refinery primary oil/water/solids separation sludge (from WWTP) and benzene	F037, D018

G.3. Post-Closure Procedures and Use of Property

- a) The Permittee shall conduct post-closure care for each hazardous waste management unit listed in Permit Condition G.2. above, to begin after completion of closure of the unit and continue for 30 years after that date, except that the 30-year post-closure care period may be shortened upon application and demonstration approved by Ohio EPA that the facility is secure, or may be extended by Ohio EPA if the Director finds this is necessary to protect human health and the environment.
- b) The Permittee shall maintain and monitor the ground-water monitoring system and comply with all other applicable requirements of OAC Rules 3745-54-90 through 99 and 3745-55-01 during the post-closure period.
- c) The Permittee shall comply with the requirements for surface impoundments as follows:
 - i) maintain the integrity and effectiveness of the final cover, including making repairs to the cap, as necessary, to correct the effects of settling, subsidence, erosion, and other events; and
 - ii) prevent run-on and run-off from eroding or otherwise damaging the final cover.
- d) Reserved

- e) The Permittee shall comply with all security requirements, as specified in the Part B permit application.
- f) The Permittee shall not allow any use of the units designated in Permit Condition G.2. which will disturb the integrity of the final cover, liners, any components of the containment system, or the function of the facility's monitoring systems during the post-closure care period.
- g) The Permittee shall implement the procedures as detailed in the Post-Closure Plan within Section I of the approved application. All post-closure care activities must be conducted in accordance with the provisions of the Post-Closure Plan.

G.4. Inspections

The Permittee shall inspect the components, structures, and equipment at the site in accordance with the Inspection Schedule.

G.5. Notices and Certification

- a) No later than sixty (60) days after certification of closure of each permitted hazardous waste disposal unit, the Permittee shall submit to the local zoning authority, or the authority with jurisdiction over local land use, and to the Director, a record of the type, location, and quantity of hazardous wastes disposed of within each cell or other disposal unit of the facility. For hazardous wastes disposed of before January 12, 1981, the Permittee shall identify the type, location, and quantity of the hazardous wastes to the best of his knowledge and in accordance with any records he has kept.
- b) Within sixty (60) days of certification of closure of the first and the last hazardous waste disposal unit, the Permittee shall:
 - i) Record, in accordance with Ohio law, a notation on the deed to the facility property, or on some other instrument that is normally examined during the title search, that will in perpetuity notify any potential purchaser of the property that:
 - aa) The land has been used to manage hazardous wastes;
 - bb) Its use is restricted under OAC Rules 3745-55-10 thru 20; and
 - cc) The survey plat and record of the type, location, and quantity of hazardous wastes disposed of within each cell or other hazardous waste disposal unit of the facility have been filed with the Director and the Allen County zoning authority.
 - ii) Submit a certification to the Director, signed by the Permittee, that he has recorded the notation specified in Permit Condition G.3(b)(i), including a copy of the document in which the notation has been placed.
- c) If the Permittee or any subsequent owner or operator of the land upon which the hazardous waste disposal unit is located, wishes to remove hazardous wastes and hazardous waste residues, the liner, if any, or contaminated soils, then he shall request a modification to this post closure permit in accordance with the applicable requirements in OAC Chapter 3745-50. The

Permittee or any subsequent owner or operator of the land shall demonstrate that the removal of hazardous wastes will satisfy the criteria of OAC Rule 3745-55-17(C).

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

G.6. Financial Assurance

The Permittee shall continuously maintain financial assurance during the post-closure period and comply with all applicable requirements of OAC Rules 3745-55-40 thru 51.

G.7. Post-Closure Permit Modifications

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

END OF PERMIT CONDITIONS

Attachment 1

OHIO CORRECTIVE ACTION PLAN

OHIO EPA DHWM

JUN 20 2003

Table of Contents

Foreword	i
Corrective Action Goal	ii
<i>Chapter 1: The Corrective Action Process</i>	1
I. Introduction	1
II. Steps in the Corrective Action Process	1
<i>Chapter 2: The RCRA Facility Assessment</i>	2
<i>Chapter 3: Interim Measures/Stabilization</i>	3
Examples of Interim Measures	4
<i>Chapter 4: The RCRA Facility Investigation</i>	5
I. Introduction	5
II. The RCRA Facility Investigation Work Plan - Ohio EPA Approach ...	5
III. The RFI Report - Ohio EPA Approach	8
IV. Identification of RCRA Corrective Action Options	8
V. Figure 4-1: Corrective Action Options	12
<i>Chapter 5: The Corrective Measures Study</i>	13
I. Introduction	13
II. The Corrective Measures Study Work Plan - Ohio EPA Approach ...	13
III. The Corrective Measures Study Report - Ohio EPA Approach	14
<i>Chapter 6: Corrective Measures Implementation</i>	15
<i>Appendix A: Corrective Action Reference List/Bibliography</i>	

OHIO EPA DHWM

JUN 20 2003

FOREWORD

This document provides the framework for the Ohio EPA Division of Hazardous Waste Management's implementation of the RCRA Corrective Action program. It was developed by a Division of Hazardous Waste Management (DHWM) workgroup that included representatives of all five district offices, DHWM Central Office, the Legal Office and the Division of Drinking and Ground Waters. It can be termed Ohio's Corrective Action Plan and is based on U.S. EPA's final Corrective Action Plan (OSWER Directive Number 9902.13-2A) that was issued in May, 1994. Ohio's plan is not meant to recreate or duplicate U.S. EPA's Corrective Action Plan (CAP) but instead is intended to be a revised, streamlined version that takes advantage of the flexibility offered in U.S. EPA's CAP while remaining consistent with the CAP. This document is subject to change based on legislative and regulatory changes currently being debated and contemplated on the national level.

Ohio EPA, through the DHWM, will use this framework in implementing RCRA Corrective Action through hazardous waste installation and operation permits issued pursuant to Ohio Revised Code Section 3734.05 and administrative orders issued pursuant to Ohio Revised Code Section 3734.20. Rule 3745-55-011 of the Ohio Administrative Code provides Ohio EPA the authority to implement RCRA Corrective Action through permits. RCRA Corrective Action requirements contained in administrative orders will be developed on a site-specific, order by order basis in conjunction with the individual facility.

DHWM stresses its willingness to work with facilities to require only that information that is truly necessary for a facility to fulfill its RCRA Corrective Action obligations and achieve final environmental remediation goals. As stated by U.S. EPA, the CAP provides an overall model for the RCRA Corrective Action process. U.S. EPA further states that the scopes of work in the CAP are not boilerplate and should only be considered menus of possible activities most facilities may be required to conduct. As represented in this document, Ohio EPA has selected only the activities from those menus that the Agency believes are necessary for a facility to conduct in order to realize the goal of the RCRA Corrective Action program. This approach should enable the Agency and facilities to move through the RCRA Corrective Action process effectively and efficiently and measurably reduce risk to human health and the environment.

**GOAL OF THE RCRA CORRECTIVE ACTION PROGRAM, AS APPLIED TO
BOTH THE OHIO EPA AND HAZARDOUS WASTE FACILITIES SUBJECT TO
RCRA CORRECTIVE ACTION:**

*TO EVALUATE THE NATURE AND EXTENT OF THE RELEASE OR THREAT OF
RELEASE OF HAZARDOUS WASTE OR CONSTITUENTS; TO EVALUATE RELEVANT
FACILITY CHARACTERISTICS (WHICH ALSO OCCURS AS PART OF THE INITIAL
ASSESSMENT OF THE FACILITY); AND TO IDENTIFY, DEVELOP AND IMPLEMENT
THE APPROPRIATE CORRECTIVE MEASURE OR MEASURES ADEQUATE TO
PROTECT HUMAN HEALTH AND THE ENVIRONMENT.*

CHAPTER 1

The Corrective Action Process

I. Introduction

Implementation of RCRA Corrective Action at Ohio RCRA facilities necessitates Ohio EPA and the facility owner/operator going through several steps to complete the process. The degree to which each step is necessary, if it is in fact necessary, depends on the available quantity and quality of environmental data and information for a particular facility, the analysis of that data and information and the collective decisions made by both the Ohio EPA and the facility, with public input, on how to respond to that data and information. A general listing and description of the steps follows.

II. Steps in the Corrective Action Process

FACILITY ASSESSMENT - Updated or conducted by Ohio EPA. It answers the questions: Is there a current release and/or imminent threat? Is there a potential release and/or imminent threat? See Chapter 2.

INTERIM MEASURE(S) - Undertaken by the facility, it addresses in the near term a release or potential release and/or an imminent threat or potential imminent threat. An Interim Measure may be required to be implemented at any step in the process. See Chapter 3.

INVESTIGATION - Undertaken by the facility. It answers the questions: How significant is the release or potential release and/or imminent threat or potential imminent threat? and provides further definition of the release or potential release and/or imminent threat or potential imminent threat. See Chapter 4.

CORRECTIVE MEASURE(S) STUDY AND DECISION - Shared responsibility by both the facility and Ohio EPA. It determines how to best address the release or potential release and/or imminent threat or potential imminent threat. See Chapter 5.

CORRECTIVE MEASURE(S) IMPLEMENTATION - Performed by the facility, it designs the solution and addresses the release or potential release and/or imminent threat or potential imminent threat. See Chapter 6.

OPERATION AND MAINTENANCE of the corrective measure addressing the release or potential release and/or imminent threat or potential imminent threat (if necessary). See Chapter 6.

CHAPTER 2

The RCRA Facility Assessment

The RCRA Facility Assessment, often referred to as either the RFA or a Preliminary Assessment/Visual Site Inspection (PA/VSI), is conducted by U.S. EPA or Ohio EPA. U.S. EPA has conducted most of the assessments by utilizing the services of one of its contractors. Ohio EPA, through its Division of Emergency and Remedial Response, has conducted some assessments. Future assessments will be conducted by the Division of Hazardous Waste Management.

The RFA documents environmental conditions at the facility in regard to past and present waste management activities. All related facility files are reviewed and a visual on-site evaluation is also performed. The final RFA document identifies all (solid) waste management units and areas of concern and indicates if either a release of hazardous waste or constituents has occurred or if the potential for such a release exists. Conclusions and recommendations are included for each unit or area regarding the need for further investigation and/or some type of corrective action.

The RFA is used in several different ways. First, it is used to determine the facility's priority for corrective action purposes under U.S. EPA's National Corrective Action Prioritization System (NCAPS). Second, it provides the factual basis for both corrective action permit terms and conditions and the findings of fact in a state administrative order. Finally, it can help determine if an interim measure is necessary to be implemented in the short term to "stabilize" a site.

If a new assessment has to be conducted, Ohio EPA will access all available sources of information in order to conduct a comprehensive, accurate facility assessment. Ohio EPA will not redo already existing assessments but will update those existing assessments as necessary. Additional information to supplement or update an existing assessment will be gathered by performing a comprehensive file review and by sending an information request letter to the subject facility. Information obtained through a response to this letter and any other information obtained from other Ohio EPA divisions, other agencies or departments or any other source will be used to build upon or update existing information. Ohio EPA will determine if field sampling (including ground water) is necessary to further document environmental conditions at a facility on a case by case basis.

CHAPTER 3

Interim Measures/Stabilization

U. S. EPA's Stabilization Initiative was developed in 1992. According to U.S. EPA, the Initiative is an implementation approach that focuses resources on near-term activities to control or abate threats and/or to prevent or minimize the further spread of contamination across many facilities rather than following the traditional process of pursuing final, comprehensive remedies at a few facilities. Interim Measures are the stabilization tools used to address obvious environmental problems in either the short or long term. Several Interim Measures may be used in combination. Examples of Interim Measures are found on the following page. These examples were taken from U.S. EPA's Corrective Action Plan (CAP).

Although the Stabilization Initiative is an approach that should be considered for all facilities subject to RCRA Corrective Action, Ohio EPA emphasizes that the need for Interim Measures is determined on a site specific basis and may be identified at any point in the corrective action process. If the need for Interim Measures is identified, Ohio EPA will require its implementation. The facility may be required to gather data to facilitate the design and implementation of Interim Measures. Interim Measures are more likely to be effective if a specific aspect of the overall contamination at a facility can be isolated in conjunction with an exposure threat to humans or ecosystems. Under these conditions, the act of implementing Interim Measures is designed to stop or slow contamination migration, thereby potentially reducing risk to human health and the environment. Site-specific data must be generated to increase the chance of success of Interim Measures. It is possible for an Interim Measure to be the final remedy at a facility. However, for facilities where additional corrective measures are necessary, Ohio EPA and the facility will ensure that the implementation of Interim Measures will complement or be consistent with the final corrective measure.

Ohio EPA will be evaluating facilities to determine the need for Interim Measures throughout the RCRA Corrective Action process as it is being implemented by the facility. This will occur on an ongoing basis as environmental data and information is generated and analyzed

Example Interim Measures

Site Security and Fencing

Ground Water

Interceptor trench/sump/subsurface drain
Pump and treat system (source removal and containment)
Physical barriers (covers/slurry walls)

Soils

Run-off/run-on control (diversion or collection devices)
Cap/cover
Source removal/excavation

Surface Water Release (point and non-point)

Overflow/underflow dams
Filter fences
Run-off/run-on control (diversion or collection devices)
Regrading/revegetation

Gas Migration Control

Barriers/collection (e.g., vapor extraction)/treatment/monitoring
Evacuation (buildings)

Particulate Emissions

Truck wash (decontamination unit)
Revegetation
Application of dust suppressant
Cover/cap

Note: Most of these examples were taken directly from U.S. EPA's CAP.

CHAPTER 4

The RCRA Facility Investigation

I. Introduction

The purpose of the investigation is to evaluate thoroughly the nature and extent of the releases or threat of releases of hazardous waste and hazardous constituents at a hazardous waste facility. Its purpose is also to gather data necessary to support the Corrective Measures Study, Interim/Stabilization Measures and final Corrective Measure Implementation. Pursuant to a RCRA Corrective Action Order or RCRA permit term or condition, the facility is required to provide Ohio EPA with a plan that furnishes information on all personnel, materials, and services necessary for, or incidental to, performing the RCRA Facility Investigation (RFI). This information, commonly referred to as the RFI Work Plan, is submitted to the Agency for review and approval. The facility is responsible for conducting the RFI. If a facility believes it is not necessary to conduct an investigation, the facility may provide a rationale on why it was not necessary to evaluate a release or threat of a release. This rationale will be subject to Ohio EPA review and approval.

Facilities are urged to work closely with the Ohio EPA project manager to establish streamlined site-specific Data Quality Objectives (DQO) tailored to the purpose(s) for which the data will be used. If applicable generic media cleanup standards are available, the DQO should be established with those standards in mind. Previously existing data generated by the facility and methods used by the facility to analyze such data will be evaluated pursuant to available federal guidance.

Ohio EPA supports a flexible approach to the overall facility investigation. In the following section, Ohio EPA has selected only those activities from the RFI Scope of Work contained in U.S. EPA's Corrective Action Plan (CAP) that the Agency believes are necessary for a facility to prepare an approvable RFI Work Plan and implement the RFI. However, Ohio EPA will consider alternatives to the approach set forth in the following section if a facility is able to justify an alternative approach based on factors specific to that facility. Ohio EPA will use available federal guidance to review the RFI Work Plan.

followed by Ohio EPA's view regarding when the component is needed, if it needs to be reviewed and if it needs to be approved. Ohio EPA notes that if generic RCRA Corrective Action cleanup standards or action levels are available for the contaminants of concern at a facility, those standards and other applicable standards will be provided to the facility prior to its submittal of the RFI Work Plan and discussed with the facility in the context of

establishing Data Quality Objectives. If such standards or levels are not available, Ohio EPA will work to develop them. In the absence of such standards, the facility shall perform a baseline risk assessment. The availability of such standards or levels in no way precludes a facility from pursuing a site specific approach to remediation.

The components include:

- 1) *Description of Current Conditions (DCC)*. This component of the Work Plan serves to provide a current, accurate representation of environmental conditions at a facility from the facility's perspective. It shall include a description of the facility's background, a preliminary assessment of the nature and extent of contamination and a description of any Interim or Stabilization Measure that was implemented. Although Ohio EPA recognizes the importance of this information, Ohio EPA will consider alternatives to the development of the DCC, as it's described in U.S. EPA's Corrective Action Plan, as long as the goal of the document is realized. Possible alternatives include use of the RCRA Facility Assessment or its equivalent, a release assessment, a conceptual site model or some combination of these.
- 2) *Objectives of the Investigation*. This component of the Work Plan lists the objectives of the investigation. The permit or order may also list the objectives of the investigation.
- 3) *Field Sampling Plan (FSP)*. This component of the Work Plan serves as a road map on how and where the facility will sample the affected environmental media at the facility. It shall be submitted to Ohio EPA and is subject to Ohio EPA review and approval. If the facility develops a plan for collecting data necessary to demonstrate the possibility of using a specific corrective technology, known as a Corrective Technology Plan (CTP), that plan may be submitted as part of the FSP. However, flexibility regarding the timing of the submittal of the CTP is necessary as development of the CTP might only occur once the Investigation has commenced.
- 4) *Quality Assurance Plan and Procedures (QAPP)*. The purpose of this component of the Work Plan is to specify the field and laboratory procedures necessary to collect, analyze, verify and assure the quality of the data gathered through implementation of the FSP. The field portion of the QAPP is necessary and shall be included with the FSP, which must be reviewed and approved by Ohio EPA. The lab portion of the QAPP may be addressed through development of a site-specific QAPP or use of a generic QAPP, which was developed by U.S. EPA Region 5 and is available. Ohio EPA supports the use of this generic QAPP, which shall be accompanied by a certification statement from the facility attesting to the facility's commitment to follow it. If deviations from the generic QAPP are desired, they shall be proposed to Ohio EPA along with sufficient justification. Such deviations are subject to review and approval by Ohio EPA.

- 5) *Health and Safety Plan (HASP)*. This component of the Work Plan is a plan developed to ensure the health and safety of the surrounding community and all persons who may be on-site during the investigation. It shall be submitted and will be reviewed for informational purposes with Ohio EPA reserving its right to comment on it. Some of the regulations governing on-site worker safety may be found in 29 Code of Federal Regulations (CFR) Part 1910 and Ohio Administrative Code (OAC) Chapter 4121:1-5. Other Occupational Safety and Health Administration (OSHA) regulations may apply. Additional regulations governing on-site and community safety are found in 40 CFR Parts 302, 311 and 312 and OAC Chapter 3750. Matters regulated by OSHA will not be evaluated by Ohio EPA. The HASP must be submitted to Ohio EPA prior to the initiation of any field work.
- 6) *Data Management Plan*. This component of the Work Plan is site-specific and describes how the raw data gathered in the field will be analyzed and presented. It shall be submitted and is subject to Ohio EPA review and approval. It may not have to be submitted with the Work Plan but it should be listed in the Schedule of Deliverables. However, if circumstances warrant, the Ohio EPA project manager may require its submittal with the Work Plan. The timing of its submittal is generally flexible as long as it is subject to Ohio EPA approval prior to its implementation. Records management/retention may be addressed in the permit, order or RFI Work Plan.
- 7) *Project Management Plan*. This component of the Work Plan describes the qualifications and responsibilities of each person who will be performing work as part of the investigation. Ohio EPA will only require submittal of a list of contractors and a table of organization. Ohio EPA reserves the right to ask for more information if deemed necessary. The Plan shall be submitted to Ohio EPA prior to the initiation of field work.
- 8) *Public Involvement Plan*. This component of the Work Plan describes how the facility will involve the public during the investigation and throughout the corrective action process. It shall be submitted and is subject to Ohio EPA review and approval. The Plan shall be consistent with the public involvement requirements of RCRA and any guidance available from U.S. EPA or Ohio EPA.
- 9) *Schedule of Activities/Submittal of Deliverables*. This component of the Work Plan describes what activities and deliverables (e.g., progress reports) will be done by whom and by when, and when they will be submitted as draft and final. It shall be submitted and is subject to initial Ohio EPA approval with the possibility of agreed-to modifications occurring subsequent to the initial approval.
- 10) *Corrective Technology Plan* (special data that must be gathered to support the possible utilization of a particular remedial technology). This component of the Work Plan is used to screen potential technologies and also identifies any special field

data that may need to be collected in order to evaluate a particular remedial technology along with the method of collecting it. It shall be submitted and is subject to Ohio EPA review but not necessarily approval. It must be site specific. It is desirable for the CTP to be submitted along with the FSP although it's possible for it to be submitted at a later date.

III. The RFI Report

The purpose of the RCRA Facility Investigation (RFI) Report is to describe the results of the investigation performed by the facility. The Report shall describe the facility's environmental setting and shall also characterize contaminant sources and contaminant characteristics. Potential receptors shall be identified. Data gathered shall be analyzed and summarized and conclusions shall be drawn about the results and the likely next step. Methodologies used for sampling and other investigatory activities shall be documented in detail. The report shall follow up on any specific items in the RFI Work Plan.

Meetings with the facility prior to completion and submission of the Report are necessary in order for the facility and Ohio EPA to agree on the future course of action in a manner that conserves the resources of both the facility and Ohio EPA to the extent practicable. A specific meeting with the facility to agree on the content and scope of the RFI Report is essential. The RFI Report should not be viewed simply as the end of one phase of the corrective action process but more as a bridge geared toward making the transition from investigation to actual cleanup of the facility. The RFI Report must be approved by Ohio EPA to provide assurances to both parties on the desired future course of corrective action at the facility.

Again, Ohio EPA supports a flexible approach to the overall facility investigation including the RFI Report. In the following section, Ohio EPA has set forth the components that shall be included in the overall RFI Report and submitted for approval. The listed components are consistent with the Ohio EPA approach on the RFI Work Plan found in Section II of this chapter. Ohio EPA will use available federal guidance to review the RFI Report.

IV. The RFI Report - Ohio EPA Approach

Ohio EPA's list of the components that shall be included in the overall RFI Report and submitted for approval is as follows.

- 1) *Purpose and Objectives.* The Report shall include an executive summary that identifies the purpose and objectives of the RFI and the RFI Report itself.
- 2) *Data Presentation and Analysis.* The Report shall present the data gathered during the investigation and shall identify any data gaps. The methodologies used to

gather, analyze and summarize the data shall be described in detail. The nature and extent of any contamination discovered during the investigation shall be revealed. Potential receptors shall be identified. Ohio EPA strongly recommends that a conceptual site model/diagram be used as a tool to facilitate site-specific conditions. Data gathered and analyzed during the investigation shall be consistent with the Data Quality Objectives that were established and described in the RFI Work Plan.

- 3) *Evaluation of Data Against Cleanup Standards.* If generic cleanup standards are available, the data shall be evaluated against those standards. In the absence of generic standards, a baseline risk assessment shall be performed. If a site-specific baseline risk assessment was performed, the methodologies and assumptions used to perform it shall be described along with any cleanup standards the facility developed. A human health and ecological risk assessment shall be included in the report. The level of detail necessary in the ecological risk assessment shall be determined as part of the process for establishing the goals of the investigation. Generally, detailed ecological risk assessments are not necessary for facilities located in urban settings.
- 4) *Summary - Identify Potential Remedies/Future Course of Action.* The summary shall fully explore and describe one of the following options/scenarios:
 - a) Identify a presumptive remedy for one or more units/media as appropriate and describe it; or
 - b) Identify units/media for which a Corrective Measures Study (CMS) or limited CMS is necessary and list potential technologies that the CMS or limited CMS will evaluate; or
 - c) Identify any units/media for which a No Further Action finding is appropriate;
 - d) Evaluate the need for an Interim Measure for site stabilization purposes; or
 - e) Evaluate the effectiveness of an already existing Interim Measure and determine if it should be continued and/or what role the Interim Measure may play in the overall corrective action that may be needed at the facility.

V. Identification of RCRA Corrective Action Options

This narrative accompanies Figure V-1 titled *Identification of RCRA Corrective Action Options*. Its purpose is to describe what Ohio EPA views as the RCRA corrective action options available to a facility once the data and information collected during the RCRA Facility Investigation (RFI) have been compiled, analyzed, verified for accuracy and accepted by the Agency. Each option is described below.

Interim Measure

If an Interim Measure (IM) was implemented prior to or during the course of the RFI, the RFI Report should examine its performance/effectiveness to date and determine if it should continue to be implemented. The RFI Report should ascertain the role, if any, the IM, or possibly a modified IM, will play as part of the overall site remedy. In some cases, the RFI Report may be the basis for initiating an IM.

Performance Based Remedy

Implementation of a Performance Based Remedy relies on a process different from that most commonly utilized to select the remedy or corrective measure, where maximum Agency involvement and oversight drives the process. The process can begin once Ohio EPA is satisfied that all releases from the facility have been adequately identified and evaluated. The facility and Ohio EPA can then attempt to agree on remedial goals and technologies needed to achieve them. The goals and technologies both need to meet the threshold and balancing criteria for corrective measures found in Chapter 5.

Once agreement on the goals and technologies is reached, Ohio EPA will not require a Corrective Measures Study to be conducted nor will it require Corrective Measure Implementation (CMI) final design plans to be submitted for review and approval. Rather, the facility will be expected to design and implement the remedy and achieve the remedial goals within a mutually agreed upon time period. The results of the remedy being implemented will be monitored by Ohio EPA and documented by the facility in a final report that shall be submitted to Ohio EPA.

Presumptive Remedy

Once the data and information from the RFI is compiled, analyzed and verified, Ohio EPA and the facility may be able to agree that remedial goals can be achieved through the implementation of a particular remedial technology. This would likely occur at less complex facilities which share common characteristics with other facilities. The goals and the selected technology must meet both the threshold and balancing criteria for corrective measures found in Chapter 5. The plan to implement a Presumptive Remedy shall be documented in the final RFI Report. Under these circumstances, Ohio EPA will not require the facility to conduct a CMS. The facility will only be expected to submit the final CMI design plans for review and approval.

Identify Potential Remedial Technologies

At what could be described as the more complex facilities, it may not be readily apparent from the data and information collected during the RFI which particular remedial technology or combination of remedial technologies may accomplish the site cleanup objectives. Under these circumstances, the facility should identify in the RFI Report which technologies it plans to

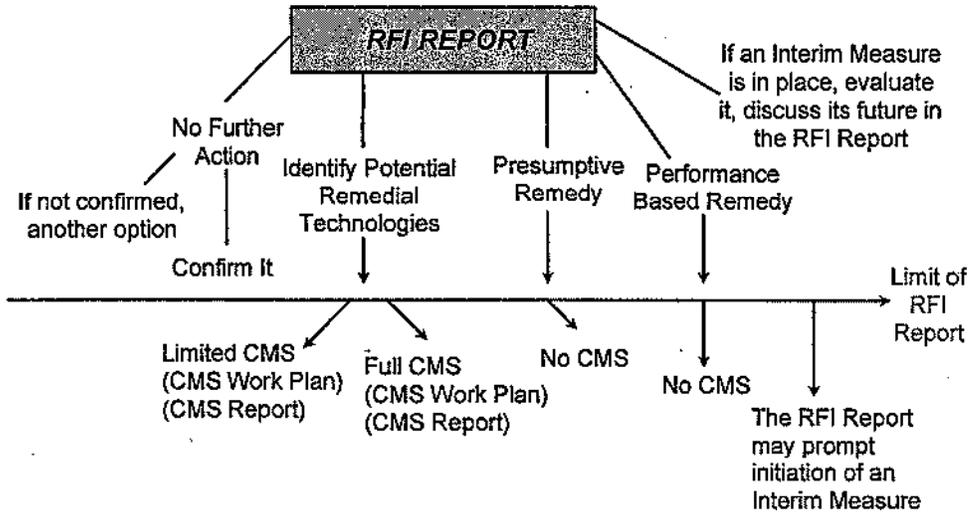
evaluate in the RFI Report. Depending on the range of possible technologies, the facility may conduct either a limited CMS or a full CMS and describe such in the CMS Work Plan to be submitted for review and approval. If the CMS is to be of limited scope, the RFI Report may include the CMS Work Plan outline.

No Further Action

The facility may conclude that, based on the data and information collected during the RFI, no corrective measure is necessary. Ohio EPA may agree with the facility but may require some type of future monitoring or institutional control(s) for continuing confirmation that no further action is necessary. Such a requirement may actually constitute a type of Presumptive Remedy. In either circumstance, the decision shall be documented in the final RFI Report. If Ohio EPA does not agree with the facility's conclusion that further action is unnecessary, the facility shall select another option that includes eventual implementation of a corrective measure. The option selected would determine the need for a limited or full CMS or if one was necessary.

Figure 4-1

Identification of RCRA Corrective Action Options



CHAPTER 5

The Corrective Measures Study

I. Introduction

The purpose of the Corrective Measures Study (CMS) portion of the RCRA Corrective Action process is to identify and evaluate potential remedial alternatives for any releases identified at a facility. The data and information gathered during the RCRA Facility Assessment (RFA), the RCRA Facility Investigation (RFI) and any Interim Measure will determine the necessity and/or scope and content of the CMS.

Ohio EPA supports a flexible, site-specific approach to development of the appropriate corrective measure(s) to be implemented at a facility. It may not be necessary for a facility to perform a CMS. If it is necessary to perform a CMS or a limited CMS, Ohio EPA, in the following section, has selected only those activities from the CMS Scope of Work contained in U.S. EPA's Corrective Action Plan that the Agency believes are necessary for a facility to prepare an approvable CMS Work Plan and CMS Report. However, Ohio EPA will consider alternatives to the approach set forth in the following section if a facility is able to justify an alternative approach based on factors specific to that facility. Ohio EPA will use available federal guidance to review the CMS Work Plan and CMS Report.

II. Corrective Measures Study Work Plan - Ohio EPA Approach

If Ohio EPA and the facility determine it's necessary to be developed and submitted, the CMS Work Plan shall include the following:

- 1) *CMS Objectives and Performance Standards;*
- 2) *A description of corrective measure technologies as a function of the following four threshold criteria and the following five balancing criteria:*
 - a. Threshold Criteria
 - i. Protect human health and the environment
 - ii. Attain media cleanup standards set by the implementing agency
 - iii. Control source of the release(s) to reduce or eliminate, to the extent practicable, further releases that may pose a threat to human health and the environment

- iv. Comply with applicable standards for management of waste;
- b. Balancing Criteria
 - i. Long term reliability and effectiveness
 - ii. Reduction in the toxicity, mobility or volume of wastes
 - iii. Short term effectiveness
 - iv. Implementability
 - v. Cost;
- 3) *Description of bench scale studies and/or limited fieldwork; and*
- 4) *Timeline/project management (includes progress reports)/outline.*
- 5) *Public involvement plan.* The plan submitted by the facility with the RFI Work Plan should have covered public participation in the CMS phase of the RCRA Corrective Action process. If an update is needed, it shall be included as part of this submittal.

The CMS Work Plan must be approved by Ohio EPA whether it is part of the RFI/RFI Report or is submitted subsequent to it.

III. Corrective Measures Study Report - Ohio EPA Approach

If necessary to be developed and submitted, the CMS report shall include the following:

- 1) *Description of Current Conditions (only if an update is necessary);*
- 2) *Performance Objectives.* Can they be met, have they changed, or have any additional contaminants been discovered? Applicable standards from Ohio EPA's Voluntary Action Program and RCRA closure (in a site-specific context) that are protective of human health and the environment may be used if appropriate;
- 3) *Identify, Screen and Evaluate Alternatives.* Select the corrective measure, including the justification for the chosen alternative;
- 4) *A demonstration that the threshold goals can be met for each chosen technology; and*
- 5) *A description of public involvement efforts and the subsequent results.*

The CMS report must be approved by Ohio EPA.

CHAPTER 6

Corrective Measures Implementation

The purpose of the Corrective Measures Implementation (CMI) portion of the RCRA Corrective Action process is to design, construct, operate, maintain and monitor the performance of the selected corrective measure/remedy.

Subsequent to Ohio EPA's approval of the RFI Report (and possibly a limited or full Corrective Measures Study Report, which is dependent upon the results of the RCRA Facility Investigation [RFI]), Ohio EPA and the facility will participate in a scoping meeting to discuss the conceptual design of the selected corrective measure(s). The facility may elect to prepare some documentation in advance of the meeting to help facilitate the design discussion. Subsequent to the meeting the facility shall submit the following:

1. *Final Design Plans, Design Specifications and an Operation and Maintenance Plan.*

Also to be included with this submittal is a projected schedule of activities, a waste management plan, a sampling and monitoring strategy, a construction work plan and applicable quality assurance/quality control procedures. The level of detail expected for each of these components is dependent on the selected corrective measure. The final plans and supporting documentation must be approved by Ohio EPA.

2. *Health and Safety Plan.* This is a separate document for the final design plans. No approval from Ohio EPA is necessary although review comments may be offered.
3. The *Public Involvement Plan* submitted by the facility with the RFI Work Plan should have covered public participation in the CMI phase of the RCRA Corrective Action process. If an update is needed, it shall be submitted at this time also for Ohio EPA's review and approval.
4. The facility shall submit a *Construction Completion Report* upon completion of construction of the selected corrective measure. This report will serve as a certification that the corrective measure was constructed according to the approved final design plans. Ohio EPA will verify/concur with the conclusions of this report.
5. The facility shall submit *Progress Reports* throughout the implementation and operation and maintenance of the selected corrective measure. The frequency of submittal of the reports will be set forth in the final design plans and will depend on the complexity of and the schedule for the implementation of the corrective measure.
6. The facility shall submit a *Corrective Measures Completion Report* once implementation of the corrective measure is completed. The timing of the submittal is dependent on the approved schedule for the implementation of the selected corrective measure. This report must be approved by Ohio EPA as it will serve to satisfy the requirements of the order or permit condition that compelled the investigation and implementation of the corrective measure.

OHIO EPA DHWM

JUN 20 2003

ATTACHMENT 2

Identification of SWMUS

OAC Rules 3745-50-44(d) & 3745-55-011

U.S. EPA and the Permittee have identified the following SWMUs for investigation during the RFI (as submitted in the Part A permit renewal, Volume 1, Section A, Figures 2 and 3) :

Land Treatment Unit:

- (f) L-4 Dump
- (g) L-5 Landfill
- (h) L-6 Dump
- (q) WP-1 Spent Catalyst Pile
- 41. Miscellaneous Sump
- 44. Acid Pond/Impounding Pound
- 46. Old Primary Pond
- 57. North Ditch
- 58. Tank 271
- 61. Trolumen Pile
- 62. E-Pond
- 63. Buckeye Road Landfill
- 64. Old Fire Training Area
- 65. Sludge Pond
- 66. Lead Waste Area
- 67. Former Coke Pile
- 68. Former Lube Plant
- 69. Aromatics Closed Drain System
- 70. Tank 214
- 71. Tank 207
- 72. Tank 209
- 73. Intermediate Tank Area

SWMU Group A:

- 3 Old Drum Storage Area
- 5 L-3 Waste Pile

The units were combined into one group due to indistinct and possibly overlapping boundaries.

These units were located in the current vicinity of an above ground storage tank.

OHIO EPA DHWM

JUN 20 2003

SWMU Group B:

- 12 Old Container Storage Area
- 32 South Drying Pit
- 34 Drying Pit
- 45 North Impounding Pond

These four units were combined into one group due to indistinct and potentially overlapping boundaries. These SWMUs are located in the current vicinity of the benzene NESHAPs unit.

SWMU Group C:

- 13 C-3 Drum Collection Area
- 59 WP-2 Spent Catalyst Pile

These two units were combined into one group due to indistinct and potentially overlapping boundaries.

SWMU Group D:

- 14 Influent Sump
- 17 API Separator
- 19 AFU Charge Sump
- 52 South Plant Sewer System
- 53 North Plant Sewer System

This group consists of units that were recommended for inspection only by the U.S. EPA. Since the wastes received by these units originate as part of the refinery waste water treatment facility, the waste material contained in these SWMUs is the same. However, each unit was evaluated discretely and not as a group during the Phase 1 RFI.

SWMU Group E:

- 30 Tank 77
- 31 Tank 77A
- 35 Tank 78
- 36 Tank 79

These four units were combined into one group because they used to manage similar wastes (wastewater treatment plant sludges) and are located in close proximity to one another. The Phase 1 RFI activities addressed each unit discretely and not as a group.

SWMU Group F:

- 42 AFU Oily Sludge Pond
- 43 Oily Sludge Pond
- 60 Sludge Drying Pit

These units were combined into one group because groundwater contamination has been observed in this area. Identification of one SWMU responsible for this contamination is not possible.

SWMU Group G:

- 47 Primary Pond
- 48 C-Pond
- 49 D-Pond
- 50 A-Pond
- 51 B-Pond

These five units were combined into one group for groundwater sampling purposes. In addition, three of these units were used to manage wastes of a similar composition. The SWMUs were investigated discretely during soil/sediment sampling.

SWMU Group H:

- 54 Slop Pond
- 55 Oil Pond No. 1
- 56 Oil Pond No. 2

These units were combined into one group because they used to manage similar wastes and because of their close geographical proximity. However, these units were investigated discretely during the Phase 1 RFI.

Section 1 of the Phase 1 RFI Report (dated January 12, 1999, received by Ohio EPA on January 21, 1999) lists all the SWMUs presently evaluated. Figures 1-2 and 1-3 in Section 1 of the Phase 1 RFI Report shows the locations of the SWMUs.

ATTACHMENT 3

Lima Refinery

OHD 005 051 826

SWMU and AOC Table

<u>Unit Name</u>	<u>SWMU or AOC</u>	<u>Dates of Operation</u>	<u>Constituents of Concern¹ wastes</u>	<u>Remedy</u>	<u>Remedy Document</u>	<u>Approval Date</u>
Land Treatment Unit	SWMU 1	Wastes received between 1981 and 1990.	Oil and grease, heavy metals, VOCs and SVOCs (waste codes K048, K049, K051 & D008) Arsenic and chromium in sediment BEHP and 1,4-dioxane in GW	Excavation and consolidation of impacted soil, install soil cover (geotextile, soil), creation of stormwater management wetland, institutional control (IC) (annual soil cover inspection)	CCR approved by Ohio EPA on August 16, 2006	
Spent Lime Application Area	SWMU 2	Area was never used.	-	NFA	RFI DOCC Report (incorporated into the Phase I RFI Workplan) approved by U.S. EPA on 8/7/1997.	
Old Drum Storage Area	SWMU 3 (Part of SWMU Group A)	Unknown, area closed in 1990	No records on the type of materials stored in area, not used on a routine basis to store wastes.	Stored drums were tested and disposed, soil excavation and confirmatory soil sampling, IC (annual	CCR approved by U.S EPA 12/30/2002	

¹ COCs listed are constituents that exceed the Phase II Comparison Criteria.

This table is for summary purposes. For detailed information refer to the remedy document for each SWMU, SWMU Group or Area.

Dates of Operation Constituents of Concern¹ Remedy Document Approval Date

wastes

<u>Unit Name</u>	<u>SWMU or AOC</u>	<u>Dates of Operation</u>	<u>Constituents of Concern¹</u> <u>wastes</u>	<u>Remedy</u> (sign inspection)	<u>Document</u>	<u>Approval Date</u>
Tank 63	SWMU 4	Disassembled in 1991	RFA recommended no further action.	NFA	RFI DOCC Report (incorporated into the Phase I RFI Workplan) approved by U.S. EPA on 8/7/1997.	
L-3 Waste Pile	SWMU 5 (Part of SWMU Group A)	Unknown per Phase II RFI Page 4-71	Benzene, ethylbenzene, toluene, total xylenes, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene	Soil excavation and confirmatory soil sampling, IC (annual sign inspection)	CCR approved by U.S EPA 12/30/2002	
L-4 Landfill	SWMU 6	Not Described	benzo(a)pyrene, dibenz(a,h)anthracene,	Soil sampling, passed HHRA, NFA	Phase II RFI Report approved by U.S EPA on 10/24/2001	
L-5 Landfill Old Refinery Dump	SWMU 7	Mid-1940s until 1960s	Foundry wastes, construction debris and refinery (petroleum) wastes Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene,	2 feet of clay placed over disposal area, some excavated soil disposed off-site. The CMI Response Area consists of a steel sheet wall, liquid collection	CCR approved by Ohio EPA on September 1, 2004.	

Page 2 of 22

¹ COCs listed are constituents that exceed the Phase II Comparison Criteria. This table is for summary purposes. For detailed information refer to the remedy document for each SWMU, SWMU Group or Area.

Dates of Operation Constituents of Concern¹, wastes Remedy Document
Approval Date

<u>Unit Name</u>	<u>SWMU or AOC</u>	<u>Dates of Operation</u>	<u>Constituents of Concern¹, wastes</u>	<u>Remedy</u>	<u>Remedy Document</u> <u>Approval Date</u>
L-6 Landfill	SWMU 8 (Part of Area 1)	1939 or 1951 until 1954	dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, arsenic, chromium and lead in soil Benzene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, indeno(1,2,3-cd)pyrene, and lead in GW	trench, installation of low permeability landfill cover and wetland cell. Semi-annual performance-based ground water monitoring was required and completed in 2007. On-going landfill water level elevation monitoring, annual report, annual inspection and cover maintenance, sign inspection, IC	Ohio EPA permit modification to remove performance-based GW monitoring 8/12/08.
Container Storage Building	SWMU 9	Container Storage Facility issued a RCRA hazardous waste permit in August 1989.	lead in soil	Limited excavation of soil Institutional control (annual sign inspection)	CCR approved by U.S. EPA on January 2, 2003
Container Storage Pad	SWMU 10		RFA recommended no further action.	NFA	RFI DOCC Report (incorporated into the Phase I RFI Workplan) approved by U.S. EPA on 8/7/1997.
Non-Hazardous Container	SWMU 11				

¹ COCs listed are constituents that exceed the Phase II Comparison Criteria.

This table is for summary purposes. For detailed information refer to the remedy document for each SWMU, SWMU Group or Area.

Unit Name SWMU or AOC Dates of Operation Constituents of Concern¹ wastes Remedy Remedy Document Approval Date

<u>Unit Name</u>	<u>SWMU or AOC</u>	<u>Dates of Operation</u>	<u>Constituents of Concern¹</u>	<u>wastes</u>	<u>Remedy</u>	<u>Remedy Document</u>	<u>Approval Date</u>
Storage Area							
Old Container Storage Area	SWMU 12 (Part of SWMU Group B and Area 3)	Closed (backfilled 1990)	benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, benzo(a)anthracene		SWMU Group B passed the U.S. EPA HHRA for industrial scenarios, IC, NFA.	Phase II RFI Report approved by U.S. EPA on 10/24/2001	
C-3 Drum Collection Area	SWMU 13 (Part of SWMU Group C)	Not Described	arsenic		SWMU Group C passed U.S. EPA HHRA, NFA.	Phase II RFI Report approved by U.S. EPA on 10/24/2001	
Influent Sump	SWMU 14 Part of SWMU Group D	Constructed in the early 1950s Part of the WWT facility	None		No visible signs of a release, NFA	Phase I RFI Report approved by U.S. EPA on 11/24/1999	
WP-1 Spent Catalyst Pile	SWMU 15 (Part of Area 4)	Taken out of service in 1986	Benzene, benzo(a)pyrene, benzo(a)anthracene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, arsenic and chromium		passed U.S. EPA HHRA, NFA	Phase II RFI Report approved by U.S. EPA 10/24/2001	
Less-Than 90-Day Storage	SWMU 16	1985/1986	RFA recommended no further action.		NFA	RFI DOCC Report (incorporated)	

¹ COCs listed are constituents that exceed the Phase II Comparison Criteria.

This table is for summary purposes. For detailed information refer to the remedy document for each SWMU, SWMU Group or Area.

<u>Unit Name</u>	<u>SWMU or AOC</u>	<u>Dates of Operation</u>	<u>Constituents of Concern¹, wastes</u>	<u>Remedy</u>	<u>Remedy Document</u>	<u>Approval Date</u>
Area						into the Phase I RFI Workplan) approved by U.S. EPA on 8/7/1997.
API Wastewater Separator	SWMU 17 Part of SWMU Group D	Constructed in the early 1950s, covers installed on the unit in 1981.	K051 hazardous waste sludge	No visible signs of a release, NFA	Phase I RFI Report approved by U.S. EPA on 11/24/1999	
Air Flotation Unit	SWMU 18		RFA recommended no further action.	NFA	RFI DOCC Report (incorporated into the Phase I RFI Workplan) approved by U.S. EPA on 8/7/1997.	
AFU Sump	SWMU 19 Part of SWMU Group D	Part of the AFU, constructed in 1966	RFA recommended no further action.	No visible signs of a release, NFA	Phase I RFI Report approved by U.S. EPA on	

¹ COCs listed are constituents that exceed the Phase II Comparison Criteria.

This table is for summary purposes. For detailed information refer to the remedy document for each SWMU, SWMU Group or Area.

<u>Unit Name</u>	<u>SWMU or AOC</u>	<u>Dates of Operation</u>	<u>Constituents of Concern¹, wastes</u>	<u>Remedy</u>	<u>Remedy Document</u>	<u>Approval Date</u>
Vacuum Filter	SWMU 20	1951-1991	RFA recommended no further action.	NFA	RFI DOCC Report (incorporated into the Phase I RFI Workplan) approved by U.S. EPA on 8/7/1997.	11/24/1999
Belt Filter Press	SWMU 21	1983-1993	RFA recommended no further action.	NFA	RFI DOCC Report (incorporated into the Phase I RFI Workplan) approved by U.S. EPA on 8/7/1997.	
Equalization Tank	SWMU 22	October 1983 -present	RFA recommended no further action.	NFA	RFI DOCC Report (incorporated into the Phase I RFI Workplan) approved by U.S. EPA on 8/7/1997.	
<u>Aeration Basins A & B</u>	<u>SWMU 23</u>					
Clarifiers A &	SWMU 24					

¹ COCs listed are constituents that exceed the Phase II Comparison Criteria.

This table is for summary purposes. For detailed information refer to the remedy document for each SWMU, SWMU Group or Area.

<u>Unit Name</u>	<u>SWMU or AOC</u>	<u>Dates of Operation</u>	<u>Constituents of Concern¹, wastes</u>	<u>Remedy</u>	<u>Remedy Document</u>	<u>Approval Date</u>
B						
Rapid Sand Filter	SWMU 25					
Effluent Sump	SWMU 26					
Sludge Thickener	SWMU 27					
Aerobic Digester	SWMU 28	Not Described	RFA recommended no further action.	NFA	RFI DOCC Report (incorporated into the Phase I RFI Workplan) approved by U.S. EPA on 8/7/1997.	U.S. EPA on 8/7/1997.
Sanitary Package Treatment Plant	SWMU 29	Not Described	RFA recommended no further action.	NFA	RFI DOCC Report (incorporated into the Phase I RFI Workplan) approved by U.S. EPA on 8/7/1997.	U.S. EPA on 8/7/1997.

¹ COCs listed are constituents that exceed the Phase II Comparison Criteria.

This table is for summary purposes. For detailed information refer to the remedy document for each SWMU, SWMMU Group or Area.

Dates of Operation
Constituents of Concern¹
wastes

<u>Unit Name</u>	<u>SWMU or AOC</u>	<u>Dates of Operation</u>	<u>Constituents of Concern¹</u> <u>wastes</u>	<u>Remedy</u>	<u>Approval Date</u>
Tank 77, Tank 77A, Tank 78, Tank 79	SWMU 30 SWMU 31 SWMU 35 SWMU 36 SWMU Group E (Part of Area 3)	Part of Operating Refinery WWTP	Used to store slop emulsion and WWTP sludges prior to dewatering. Benzo(a)pyrene	SWMU Grps. B, E and F combined into Area 3 for further evaluation. Poses a risk for high frequency workers IC (annual sign inspections)	Phase II RFI Report approved by U.S EPA on 10/24/2001
South Container Drying Pit	SWMU 32 (Part of SWMU Group B and Area 3)	Taken out of service in 1989	dibenz(a,h)anthracene,	SWMU Group B passed the U.S. EPA HHRA for industrial scenarios, IC, NFA.	Phase II RFI Report approved by U.S EPA on 10/24/2001
New Lime Pit	SWMU 33	Closed in 1986	Stored boiler house waste lime sludge, RFA recommended no further action.	During closure, pit area excavated, cleaned, regraded and seeded. NFA	RFI DOCC Report (incorporated into the Phase I RFI Workplan) approved by U.S. EPA on 8/7/1997.
North Container	SWMU 34 (Part of SWMU Group B and	Taken out of service in	benzo(a)pyrene	SWMU Group B passed the U.S. EPA HHRA for industrial scenarios, IC,	Phase II RFI Report approved by

¹ COCs listed are constituents that exceed the Phase II Comparison Criteria.

This table is for summary purposes. For detailed information refer to the remedy document for each SWMU, SWMU Group or Area.

Dates of Operation Constituents of Concern¹, wastes Remedy Approval Date

<u>Unit Name</u>	<u>SWMU or AOC</u>	<u>Dates of Operation</u>	<u>Constituents of Concern¹, wastes</u>	<u>Remedy</u>	<u>Approval Date</u>
Drying Pit	Area 3)	1989		NFA.	U.S EPA on 10/24/2001
Tank 84	SWMU 37	1951-present	Components of the refinery's slop oil emulsion treatment plant. RFA recommended no further action.	NFA	RFI DOCC Report (incorporated into the Phase I RFI Workplan) approved by U.S. EPA on 8/7/1997.
Tank 85	SWMU 38				
Sludge Storage Tank 72	SWMU 39	November 1985-present	RFA recommended no further action.	NFA	RFI DOCC Report (incorporated into the Phase I RFI Workplan) approved by U.S. EPA on 8/7/1997.
API Bottoms Thickener	SWMU 40	1984-present	RFA recommended no further action.	NFA	RFI DOCC Report (incorporated into the Phase I RFI Workplan)

¹ COCs listed are constituents that exceed the Phase II Comparison Criteria.

This table is for summary purposes. For detailed information refer to the remedy document for each SWMU, SWMU Group or Area.

Unit Name	SWMU or AOC	Dates of Operation	Constituents of Concern ¹ wastes	Remedy	Approval Date
Miscellaneous Sump	SWMU 41	Not Described	No Phase II criteria exceedances - SWMU 41 eliminated during Phase I	NFA	Phase I RFI Report approved by U.S. EPA on 11/24/1999
AFU Sludge Pond, Oily Sludge Pond, and Sludge and Sludge Drying Pit	SWMUs 42, 43 & 60 SWMU Group F	AFU and Oily Sludge Pond were in service from ~1950 until 1985	Benzene, benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene, dibenz(a,h)anthracene and indeno(1,2,3-cd)pyrene Lead in GW	Removal of stabilized hazardous waste, in-situ stabilization of oily sand, low permeability cover overlain with gravel and concrete, passed HHRA for industrial scenarios, IC, annual inspection of cover system and submit report to Ohio EPA	CCR approved by Ohio EPA on November 9, 2006
Acid Pond / Impounding Pond	SWMU 44	Sludge removed in the 1970's	Arsenic and benzene Contained corrosive sludges	passed HHRA, NFA	Phase II RFI Report approved by U.S. EPA on 10/24/2001
North Impounding	SWMU 45 (Part of SWMU Group B and	1973 until 1989 and	Benzo(a)pyrene, benzo(a)anthracene,	SWMU Group B passed the U.S. EPA HHRA for	Phase II RFI Report

¹ COCs listed are constituents that exceed the Phase II Comparison Criteria.

This table is for summary purposes. For detailed information refer to the remedy document for each SWMU, SWMU Group or Area.

Dates of Operation
Constituents of Concern,¹
wastes

<u>Unit Name</u>	<u>SWMU or AOC</u>	<u>Dates of Operation</u>	<u>Constituents of Concern,¹ wastes</u>	<u>Remedy</u>	<u>Approval Date</u>
Pond	Area 3)	backfilled in 1990	benzo(b)fluoranthene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene and arsenic Sludge and contaminated soils were stabilized and disposed off-site after testing non-hazardous	industrial scenarios, IC, NFA.	approved by U.S EPA on 10/24/2001
Old Primary Pond	SWMU 46 (Part of Area 4)	1960s to 1984 closed in 1985	Groundwater: lead, benzene and 1-4-Dioxane Soil: benzene, benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene arsenic and chromium	Material within SWMU boundary (including the sand immediately underneath the sludge) was removed, stabilized and placed back into the SWMU in 1985. The unit was re-stabilized in 2002. Semi-annual performance-based ground water monitoring was required. Annual sign inspection, cover inspection and maintenance.	CMI CCR from U.S. EPA on Jan. 4, 2003. Ohio EPA permit mod to remove performance-based GW monitoring 8/12/08
Primary Pond *RCRA	SWMU 47 (Part of SWMU Group G)	1972 to 1984 (secondary containment)	No Phase II criteria exceedances - SWMU Group G eliminated during Phase I	Addressed under RCRA Closure program: landfill closure: sludge stabilized	Phase I RFI Report (1/2000),

¹ COCs listed are constituents that exceed the Phase II Comparison Criteria.
This table is for summary purposes. For detailed information refer to the remedy document for each SWMU, SWMU Group or Area.

<u>Unit Name</u>	<u>SWMU or AOC</u>	<u>Dates of Operation</u>	<u>Constituents of Concern¹, wastes</u>	<u>Remedy</u>	<u>Remedy Document</u>	<u>Approval Date</u>
------------------	--------------------	---------------------------	--	---------------	------------------------	----------------------

Closure*		1984 to 1984 (primary containment)		and consolidated/RCRA cover constructed over mass. Void space clean closed and backfilled. Semi-annual post-closure GW monitoring ongoing. On-going cap inspection and maintenance.	approved by U.S EPA on 11/24/1999 Ohio EPA approved RCRA Closure certification on 12/12/02	
C-Pond New Secondary Pond *RCRA Closure*	SWMU 48 (Part of SWMU Group G)	1970 until replaced by storm water impoundment tank (G-tank) by March 29, 1994	No Phase II criteria exceedances - SWMU Group G eliminated during Phase I.	Addressed under RCRA Closure program: sludge stabilized/consolidated into Primary Pond along with contaminated soil. C Pond was "Clean Closed". No GW monitoring required. NFA	Phase I RFI Report approved by U.S EPA on 11/24/1999 Ohio EPA approved RCRA Closure certification on 12/12/02	
D-Pond	SWMU 49 Part of SWMU Group G	1970-1983	Biological wastewater treatment polishing pond, wastewater effluent No Phase II criteria exceedances - SWMU Group G eliminated during Phase I.	Pond drained in 1988, sludge dewatered and stabilized, some stabilized sludge disposed off-site, other sludge stayed on-site NFA	Phase I RFI Report approved by U.S EPA on 11/24/1999	

¹ COCs listed are constituents that exceed the Phase II Comparison Criteria.

This table is for summary purposes. For detailed information refer to the remedy document for each SWMU, SWMU Group or Area.

<u>Unit Name</u>	<u>SWMU or AOC</u>	<u>Dates of Operation</u>	<u>Constituents of Concern¹, wastes</u>	<u>Remedy</u>	<u>Remedy Document</u>	<u>Approval Date</u>
------------------	--------------------	---------------------------	--	---------------	------------------------	----------------------

A-Pond	SWMU 50 Part of SWMU Group G	Still in service	Biological wastewater treatment polishing pond, wastewater effluent No Phase II criteria exceedances - SWMU Group G eliminated during Phase I.	NFA	Phase I RFI Report approved by U.S. EPA on 11/24/1999	
B-Pond	SWMU 51 Part of SWMU Group G	Still in service	Biological wastewater treatment polishing pond, wastewater effluent No Phase II criteria exceedances - SWMU Group G eliminated during Phase I.	NFA	Phase I RFI Report approved by U.S. EPA on 11/24/1999	
North and South Sewer Systems	SWMU 52 & 53 Part of SWMU Group D	North Sewer constructed in the early 1950s South Sewer constructed in the 1980s. Still in service.	Materials handled by the Systems include: Cooling Tower Blowdown, Boiler Blowdown, Stormwater Runoff, BP Terminals Water Draws, BP Chemical V2 Water and Sanitary Wastewater.	An integrity study conducted at the North and South sewers involved Thermal Infrared Radiation (TIR) study was completed in May 2002 and roughly 29,000 lineal feet of sewer were investigated. NFA	U.S. EPA approved the TIR Summary Report on May 1, 2003.	
Slop Pond	SWMU 54 Part of SWMU Group	1930s or 1940s until	Stormwater run-off, benzene, benzo(a)pyrene	Drained, filled and replaced w/tankage (AST 248 & 249) SWMU Group H passed the	Phase II RFI Report approved by	

¹ COCs listed are constituents that exceed the Phase II Comparison Criteria.

This table is for summary purposes. For detailed information refer to the remedy document for each SWMU, SWMU Group or Area.

Dates of Operation
Constituents of Concern¹
wastesRemedy
Document

<u>Unit Name</u>	<u>SWMU or AOC</u>	<u>Dates of Operation</u>	<u>Constituents of Concern¹</u> <u>wastes</u>	<u>Remedy</u>	<u>Approval Date</u>
	H, part of Area 1	1956		HHRA, NFA.	U.S EPA on 10/24/2001
Oil Pond No. 1	SWMU 55 Part of SWMU Group H, part of Area 1	1930s or 1940s until 1956	Stormwater run-off, benzo(a)pyrene, dibenz(a,h)anthracene,	Drained, filled and replaced w/tankage (AST 248 & 249) SWMU Group H passed the HHRA, NFA.	Phase II RFI Report approved by U.S EPA on 10/24/2001
Oil Pond No. 2	SWMU 56 Part of SWMU Group H, part of Area 1	1930s or 1940s until 1956	Stormwater run-off benzo(a)pyrene,	Drained, filled and replaced w/tankage (AST 248 & 249) SWMU Group H passed the HHRA, NFA.	Phase II RFI Report approved by U.S EPA on 10/24/2001
North Ditch	SWMU 57	Replaced by plant sewer system, covered by RR track embankment	Stormwater convergence structure, surface run-off arsenic, benzo(a)pyrene	SWMU 57 passed the HHRA, IC, annual sign inspection,	Phase II RFI Report approved by U.S EPA on 10/24/2001
Tank 231	SWMU 58	1939 or 1951 until 1954	Arsenic and benzene in Tank 231 soil.	Limited excavation of soil Tank stored toluene (product), spill. Tank 231 passed U.S. EPA risk assessment but benzene identified as a COC due to	CCR approved by U.S. EPA on January 2, 2003

¹ COCs listed are constituents that exceed the Phase II Comparison Criteria.

This table is for summary purposes. For detailed information refer to the remedy document for each SWMU, SWMU Group or Area.

Constituents of Concern¹,
wastesDates of
OperationSWMU or AOCUnit NameRemedy

<u>Unit Name</u>	<u>SWMU or AOC</u>	<u>Dates of Operation</u>	<u>Constituents of Concern¹, wastes</u>	<u>Remedy</u>	<u>Document</u> <u>Approval Date</u>
Trolumen Area	SWMU 61	1970-1991	benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene and dibenz(a,h)anthracene in soil	risk-management decision Institutional control (annual sign inspection) Excavation and disposal of the impacted soil and concrete debris. The affected areas were backfilled with soil from an on-site borrow area. NFA	CCR approved by Ohio EPA on May 7, 2008
E-Pond	SWMU 62	1958-October 1977	benzo(a)pyrene, dibenz(a,h)anthracene, PCBs (Aroclor 1248) and chromium, in soil Benzene, 1,4-dioxane, antimony, arsenic, thallium and lead in GW	October 1977 sludge was removed and covered w/a clay cap. The ecological remedy consisted of placement of a soil cover over the area, site grading and planting of native species over the area. Performance-based ground water monitoring was required (semi-annual) until 8/12/08 permit mod. Annual sign and cover inspections kept at facility.	CCR approved November 18, 2002 by U.S. EPA Ohio EPA permit mod to remove GW monitoring 8/12/08.

¹ COCs listed are constituents that exceed the Phase II Comparison Criteria.

<u>Unit Name</u>	<u>SWMU or AOC</u>	<u>Dates of Operation</u>	<u>Constituents of Concern¹, wastes</u>	<u>Remedy</u>	<u>Remedy Document</u>	<u>Approval Date</u>
Buckeye Road Landfill	SWMU 63	1972-1984,	Refinery and municipal wastes BEHP, 1,2-dichloropropane, chloroethane, VC, arsenic, cadmium, lead and thallium in GW	Institutional Controls per CMS and CMI Work Plan Performance-based ground water monitoring was required (semi-annually) until 8/12/08 permit modification. NFA	U.S EPA 12/12/2001, 8/18/2002 (CMI & PBGMP) OEPA Permit Modification to remove PBGM 8/12/2008	
Old Fire Training Area	SWMU 64	?-1991	18 inches of surface soils disposed off-site as non-hazardous in 1991. No Phase II criteria exceedances - SWMU 64 eliminated during Phase I.	NFA	Phase I RFI Report approved by U.S EPA on 11/24/1999	
Old Sludge Pond	SWMU 65 (Part of Area 2)	Unknown. AST 214 (SWMU 70) was/is currently at the location	Benzene, total xylenes	SWMU 65 passed the Phase II RFI HHRA, NFA.	Phase II RFI Report approved by U.S EPA on 10/24/2001	
Leaded Waste Area	SWMU 66	Spill in Feb. 1982	Tetraethyl lead spill, benzo(a)pyrene in soil	Passed Phase II HHRA and Eco Risk, NFA	Phase II RFI Report approved by U.S EPA on	

¹ COCs listed are constituents that exceed the Phase II Comparison Criteria.

This table is for summary purposes. For detailed information refer to the remedy document for each SWMU, SWMU Group or Area.

Unit Name	SWMU or AOC	Dates of Operation	Constituents of Concern ¹ , wastes	Remedy	Approval Date
Former Coke Pile	SWMU 67	?-summer 1989	Arsenic, benzo(a)pyrene & dibenz(a,h)anthracene in soil	Coke fines shipped to customers, upper soils removed, area regraded and fill layer added over footprint of area Passed U.S. EPA's HHRA, IC, annual sign inspection	10/24/2001 Phase II RFI Report approved by U.S EPA on 10/24/2001
Former Lube Plant	SWMU 68	Unknown	Lubricating oils for industrial and mechanical applications, No Phase II criteria exceedances - SWMU 68 eliminated during Phase I.	NFA	Phase I RFI Report approved by U.S EPA on 11/24/1999
Aromatics Closed Drain System	SWMU 69	2 leaks detected on 4/23/96	Off-specification products collected, benzo(a)pyrene	single, low level exceedance, NFA	Phase I RFI Report approved by U.S EPA on 11/24/1999
AST 214	SWMU 70	Leak determined on 6/26/96	Gasoline storage, arsenic exceedance	Isolated, low level exceedance NFA	Phase I RFI Report approved by U.S EPA on 11/24/1999

¹ COCs listed are constituents that exceed the Phase II Comparison Criteria.

This table is for summary purposes. For detailed information refer to the remedy document for each SWMU, SWMU Group or Area.

Dates of Operation Constituents of Concern¹, wastes Remedy Document Approval Date

<u>Unit Name</u>	<u>SWMU or AOC</u>	<u>Dates of Operation</u>	<u>Constituents of Concern¹, wastes</u>	<u>Remedy</u>	<u>Remedy Document</u>	<u>Approval Date</u>
AST 207	SWMU 71	Leak determined on 3/26/97	Used to store gasoline. No Phase II criteria exceedances - SWMU 71 eliminated during Phase I	NFA	Phase I RFI Report approved by U.S. EPA on 11/24/1999	11/24/1999
AST 209	SWMU 72	Several holes discovered in the floor of the tank on 7/8/97.	Used to store gasoline. No Phase II criteria exceedances - SWMU 72 eliminated during Phase I	NFA	Phase I RFI Report approved by U.S. EPA on 11/24/1999	11/24/1999
Area 2	SWMU Group A (Old Drum Storage Area (SWMU 3) and L-3 Waste Pile (SWMU 5)) Old Sludge Pond (SWMU 65)	Old Drum Storage area closed in 1990	Benzene, ethylbenzene, toluene, xylene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene & indeno(1,2,3-cd)pyrene in soil	involved institutional controls, limited soil excavation activities and backfilling with clean soil. NFA	CCR approved by U.S. EPA on 12/30/2002.	12/30/2002
Area 3	SWMU Groups B, E and F	See individual SWMU Groups	Benzene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene & indeno(1,2,3-cd)pyrene in soil	Area covered with asphalt and gravel, therefore no exposed surface soils. Semi-annual performance-based GW monitoring until 8/12/08 permit modification. Annual technical impracticability (TI)	CMI Conceptual Work Plan (7/2002) approved by U.S. EPA 8/16/02	8/16/02

¹ COCs listed are constituents that exceed the Phase II Comparison Criteria.

This table is for summary purposes. For detailed information refer to the remedy document for each SWMU, SWMU Group or Area.

Constituents of Concern¹
wastesDates of
OperationSWMU or AOCUnit NameRemedy
Approval DateRemedy
Document

<u>Unit Name</u>	<u>SWMU or AOC</u>	<u>Dates of</u> <u>Operation</u>	<u>Constituents of Concern¹</u> <u>wastes</u>	<u>Remedy</u> <u>Approval Date</u>	<u>Remedy</u> <u>Document</u>
			arsenic and lead in GW	monitoring. Look for sheen on GW to determine if contamination migrating from soil to GW. If ground water monitoring indicates migration or unacceptable risk, implement remediation at the downgradient perimeter of the LNAPL as recommended in the October 2002 report titled "Technical Impracticability Area 3 LNAPL." Reassess technical impracticability (TI) of LNAPL remediation and submit a demonstration in 5 year intervals starting in 2007.	Technical Impracticability Demonstration (TID) (10/2002), approved by U.S. EPA 5/13/03 Addendum to TID (10/07) approved by Ohio EPA 3/6/08
Area 4	SWMUs 15 (WP-1 Spent Catalyst Pile), 46 (Old Primary Pond) & 73 (Intermediate Tank Area)	SWMU 15 – Storage of spent catalyst material until 1986 SWMU 46 – see "Old Primary	SWMU 15 - Benzene, benzo(a)anthracene, benzo(a)pyrene, dibenz(a,h)anthracene & indeno(1,2,3-cd)pyrene, arsenic & chromium in soil SWMU 46 - Benzene, 1,4-	Annual sign inspection around LNAPL area SWMUs 15 & 73 passed U.S. EPA HHRA, IC, NFA SWMU 46- In 2001, material within SWMU boundary (including the sand immediately underneath the sludge) was stabilized. Semi-annual GW	SWMUs 15 & 73 - Phase II RFI Report, U.S EPA 10/24/2001 SWMU 46 - CMI CCR approved by

¹ COCs listed are constituents that exceed the Phase II Comparison Criteria.

<u>Unit Name</u>	<u>SWMU or AOC</u>	<u>Dates of Operation</u>	<u>Constituents of Concern¹, wastes</u>	<u>Remedy</u>	<u>Remedy Document</u>	<u>Approval Date</u>
		Pond" SWMU 73 - Jan 6, 1995: 8,200 barrel Jet A spill,	dioxane and lead in GW SWMU 73 - Oct 1996: "Jet A" discovered in monitoring well FW-09S	monitoring performed per PBGMP until 2008 permit modification. NFA	U.S EPA on 1/4/2003. OEPA Permit Modification to remove PBGM 8/12/2008	
C-3 Drum Collection Area and WP-2 Spent Catalyst Pile	SWMU 13 & SWMU 59 SWMU Group C	SWMU was used in the 1980's	Arsenic in soil	Passed U.S. EPA HHRA, IC, NFA	Phase II RFI Report approved by U.S EPA on 10/24/2001	
Ottawa River	AOC	NA	Sediment: Acenaphthene, benzo(a)anthracene, benzo(b)fluoranthene, diethyl phthalate, fluoranthene, fluorine, naphthalene, phenanthrene, pyrene carbon disulfide	Institutional controls per CMS and CMI Work Plan Passed HHRA and ERA, NFA Annual sign inspection.	U.S. EPA 12/12/2001, 8/18/2002	
Zurmeily Creek	AOC	NA	Lead in surface water, total cyanide and benzo(a)pyrene in sediment	Institutional controls per CMS and CMI Work Plan Annual sign inspection.	U.S. EPA 12/12/2001, 8/18/2002	

¹ COCs listed are constituents that exceed the Phase II Comparison Criteria.
This table is for summary purposes. For detailed information refer to the remedy document for each SWMU, SWMU Group or Area.

SWMU Group B consists of: Old Container Storage Area (SWMU 12), South Container Drying Pit (SWMU 32), North Container Drying Pit (SWMU 34), North Impounding Pond (SWMU 45)

SWMU Group E consists of: Tank 77 (SWMU 30), Tank 77A (SWMU 31), Tank 78 (SWMU 35), Tank 79 (SWMU 36)

SWMU Group F consists of: Air Flotation Unit (AFU) Pond (SWMU 42), Oily Sludge Pond (SWMU 43), Sludge Drying Pit (SWMU 60)

¹ COCs listed are constituents that exceed the Phase II Comparison Criteria.

This table is for summary purposes. For detailed information refer to the remedy document for each SWMU, SWMU Group or Area.

Acronyms & Abbreviations

AOC	Area of Concern			
AST	Aboveground Storage Tank	HHRA		Human Health Risk Assessment
BEHP	Bis(2-ethylhexyl)phthalate	IC		Institutional Control
COC	Constituent of Concern	LNAPL		Light non-aqueous phase liquid
CCR	Construction Completion Report	NA		Not Applicable
CMI	Corrective Measures Implementation	NFA		No Further Action
CMS	Corrective Measures Study	PBGMP		Performance Based Groundwater Monitoring Plan
DOCC	Description of Current Conditions	SWMU		Solid Waste Management Unit
ERA	Ecological Risk Assessment	TI		Technical Impracticability
GW	Ground Water	VC		Vinyl Chloride

BP Lima SWMU table 010213.doc

¹ COCs listed are constituents that exceed the Phase II Comparison Criteria.

This table is for summary purposes. For detailed information refer to the remedy document for each SWMU, SWMU Group or Area.