STATE OF MISSISSIPPI
HAZARDOUS WASTE MANAGEMENT PERMIT

TO CONDUCT POST-CLOSURE ACTIVITIES OF A HAZARDOUS WASTE MANAGEMENT FACILITY IN ACCORDANCE WITH THE REGULATIONS GOVERNING HAZARDOUS WASTE MANAGEMENT

THIS CERTIFIES THAT

Greenfield Environmental Multistate Trust, LLC
MSD 081 387 730

is hereby authorized to conduct post-closure care for a closed surface impoundment

located at

Highway 11 South
Meridian, Mississippi
Lauderdale County

This permit is issued under the authority of the Mississippi Solid Wastes Disposal Law, and particularly Section 17-17-27 thereof, and rules adopted and promulgated thereunder, all of which authorize the Department of Environmental Quality to enforce all applicable requirements, under the Mississippi Hazardous Waste Management Regulations, and associated conditions included therein.

MISSISSIPPI ENVIRONMENTAL QUALITY PERMIT BOARD

Mark Williams

AUTHORIZED SIGNATURE
MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit Issued: September 18, 1998 **Permit No.: HW-88-730-01**

Modified: April 13, 2006 (Name Change)

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Expires: August 31, 2008 (Administratively Continued)

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Attachments are taken directly from the application and have been reformatted to fit the permit.

MODULE I - GENERAL PERMIT CONDITIONS

I.A. EFFECT OF PERMIT

The Permittee is required to conduct post-closure activities for a closed hazardous waste surface impoundment in accordance with the conditions of this Permit. Subject to Mississippi Hazardous Waste Management Regulation (MHWMR) 270.4, compliance with this Permit generally constitutes compliance, for purposes of enforcement, with Mississippi Solid Waste Disposal Law (MSWDL) of 1974, as amended. Issuance of this Permit does not convey any property rights of any sort or any exclusive privilege; nor does it authorize any injury to persons or property, any invasion of other private rights, any infringement of state or local law or regulations, or preclude compliance with any other Federal, State, and/or local laws and/or regulations governing the treatment and handling of explosives. Compliance with the terms of this Permit does not constitute a defense to any order issued or any action brought under Sections 3008(a), 3008(h), 3013, or 7003 of RCRA; Sections 106(a), 104 or 107 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 U.S.C. 9601 *et seq.*, commonly known as CERCLA), or any other law providing for protection of public health or the environment. [MHWMR 270.4, 270.30(g)]

I.B. PERMIT ACTIONS

II.A.1. Permit Modification, Revocation and Reissuance, and Termination

This Permit may be modified, revoked and reissued, or terminated for cause, as specified in MHWMR 270.41, 270.42, and 270.43. The filing of a request for a permit modification, revocation and reissuance, or termination, 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 condition. [MHWMR 270.4(a) and 270.30(t)]

II.A.1. Permit Renewal

This Permit may be renewed as specified in MHWMR 270.30(b) and Permit Condition I.E.2. Review of any application for a Permit renewal shall consider improvements in the state of control and measurement technology, as well as changes in applicable regulations. [MHWMR 270.30(b)]

I.C. 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. [MHWMR 124.16(a)]

I.D. DEFINITIONS

For purposes of this Permit, terms used herein shall have the same meaning as those in MHWMR Parts 124, 260, 264, 266, 268, and 270, unless this Permit specifically

provides otherwise; where terms are not defined in the regulations or the Permit, the meaning associated with such terms shall be defined by a standard dictionary reference or the generally accepted scientific or industrial meaning of the term.

I.D.1 "Action levels" for the purposes of this permit are health-based concentrations of hazardous constituents determined to be indicators for the protection of human health and/or the environment.

I.D.2 The term "area of concern" (AOC) for purposes of this permit includes any area having a probable release of a hazardous waste or hazardous constituent which is not from a solid waste management unit and is determined by the Director to pose a current or potential threat to human health or the environment. Such areas of concern may require investigations and remedial action as required under Section 3005(c)(3) of the Resource conservation and Recovery Act and MHWMR 270.32(b)(2) in order to ensure adequate protection of human health and the environment.

I.D.3 A "Corrective Action Management Unit" (CAMU) for purposes of this permit, includes any area within a facility that is designated by the Director under Part 264 Subpart S, for the purpose of implementing corrective action requirements under MHWMR 264.101 and RCRA section 3008(h). A CAMU shall only be used for the management of remediation wastes pursuant to implementing such corrective action requirements at the facility.

I.D.4 "Corrective measures" for purposes of this permit, include all corrective action necessary to protect human health and the environment for all releases of hazardous waste or hazardous constituents from any solid waste management unit at the facility, regardless of the time at which waste was placed in the unit, as required under MHWMR 264.101.

Corrective measures may address releases to air, soils, surface water or groundwater.

I.D.5 "Director" means the Executive Director of the Mississippi Department of Environmental Quality, or his designee or authorized representative.

I.D.6 "Extent of contamination" for the purposes of this permit is defined as the horizontal and vertical area in which the concentrations of hazardous constituents in the environmental media being investigated are above detection limits or background concentrations indicative of the region, whichever is appropriate as determined by the Director.

I.D.7 "Facility" for purposes of this permit includes all contiguous land, and structures, other appurtenances, and improvements on the land, used for treating, storing or disposing of hazardous waste. A facility may consist of several treatment, storage, or disposal operational units (e.g., one or more landfills, surface impoundments, or combination of them). For the purposes of implementing corrective action under MHWMR 264.101, a facility includes all contiguous property under the control of the owner or operator seeking a permit under Subtitle C of RCRA.

I.D.8 A "hazardous constituent" for purposes of this permit are those

substances listed in MHWMR 261 Appendix VIII and Part 264 Appendix IX.

I.D.9 "Interim Measures" for purposes of this permit are actions necessary to minimize or prevent the further migration of contaminants and limit actual or potential human and environmental exposure to contaminants while long-term corrective action remedies are evaluated and, if necessary, implemented.

I.D.10 "Land Disposal" for purposes of this permit and MHWMR Part 268 means placement in or on the land except for a CAMU and includes, but is not limited to, placement in a landfill, surface impoundment, waste pile, injection well, land treatment facility, salt dome formation, underground mine or cave, or concrete vault or bunker intended for disposal purposes.

I.D.11 "Landfill" for the purposes of this permit includes any disposal facility or part of a facility where hazardous waste is placed in or on the land and which is not a pile, a land treatment facility, a surface impoundment, an underground injection well, a salt dome formation, a salt bed formation, an underground mine, a cave, or a corrective action management unit.

I.D.12 A "release" for purposes of this permit includes any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment of any hazardous waste or hazardous constituents.

I.D.13 "Remediation waste" for the purposes of this permit includes all solid and hazardous wastes, and all media (including ground water, surface water, soils, and sediments) and debris, which contain listed hazardous wastes or which themselves exhibit a hazardous waste characteristic, that are managed for the purpose of implementing corrective action requirements under MHWMR 264.101 and RCRA section 3008(h). For a given facility, remediation wastes may originate only from within the facility boundary, but may include waste managed in implementing RCRA sections 3004(v) or 3008(h) for releases beyond the facility boundary.

I.D.14 "Solid waste" means any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities, but does not include solid or dissolved material in domestic sewage, or solid or dissolved materials in irrigation return flows or industrial discharges which are point sources subject to permits under section 402 of the Federal Water Pollution Control Act, as amended (86 Stat. 880), or source, special nuclear, or by-product material as defined by the Atomic Energy Act of 1954, as amended (68 Stat. 923).

I.D.15 A "solid waste management unit" (SWMU) for the purposes of this permit includes any unit which has been used for the treatment, storage, or

disposal of solid waste at any time, irrespective of whether the unit is or ever was intended for the management of solid waste. RCRA regulated hazardous waste management units are also solid waste management units. SWMUs include areas that have been contaminated by routine and systematic releases of hazardous waste or hazardous constituents, excluding one-time accidental spills that are immediately remediated and cannot be linked to solid waste management activities (e.g. product or process spills).

I.D.16 A "Temporary Unit" (TU) for the purposes of this permit includes any temporary tanks and/or container storage areas used solely for treatment or storage of hazardous remediation wastes during specific remediation activities. Designated by the Regional Administrator, such units must conform to specific standards, and may only be in operation for a period of time as specified in this permit.

I.D.17 A "unit" for the purposes of this permit includes, but is not limited to, any landfill, surface impoundment, waste pile, land treatment unit, incinerator, injection well, tank, container storage area, septic tank, drain field, wastewater treatment unit, elementary neutralization unit, transfer station, or recycling unit.

I.E DUTIES AND REQUIREMENTS

I.E.1 Duty to Comply

The Permittee shall comply with all conditions of this Permit, except to the extent and for the duration such noncompliance is authorized by an emergency Permit. Any Permit noncompliance, other than noncompliance authorized by an emergency Permit, constitutes a violation of Mississippi Solid Waste Disposal Law, Sections 17-17-1, et seq., Mississippi Code Annotated and is grounds for enforcement action; for Permit termination, revocation and reissuance, or modification; or for denial of a Permit renewal application. [MHWMR 270.30(a)]

I.E.2 Duty to Reapply

If the Permittee wishes to continue an activity allowed by this Permit after the expiration date of this Permit, the Permittee shall submit a complete application for a new Permit at least 180 days prior to Permit expiration. [MHWMR 270.10(h), 270.30(b)]

I.E.3 Obligation for Corrective Action

The Permittee is required to continue this permit for any period necessary to comply with the corrective action requirements of this permit.

I.E.4 Permit Expiration

Pursuant to MHWMR 270.50, this Permit shall be effective for a fixed term not to exceed ten years. As long as MDEQ is the Permit-issuing authority, this Permit and all conditions herein will remain in effect beyond the Permit's expiration date, if the Permittee has submitted a timely, complete application (see MHWMR

270.10, 270.13 through 270.29) and, through no fault of the Permittee, the Director has not issued a new Permit, as set forth in MHWMR 270.51.

I.E.5 Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for the Permittee, in an enforcement action that it would have been necessary, to halt or reduce the Permitted activity in order to maintain compliance with the conditions of this Permit. [MHWMR270.30(c)]

I.E.6 Duty to Mitigate

In the event of noncompliance with this Permit, the Permittee shall take all reasonable steps to minimize releases to the environment and shall carry out such measures, as are reasonable, to prevent significant adverse impacts on human health or the environment. [MHWMR 270.30(d)]

I.E.7 Proper Operation and Maintenance

The Permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions of this Permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and 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 conditions of this Permit. [MHWMR 270.30(e)]

I.E.8 Duty to Provide Information

The Permittee shall furnish to the Director, within a reasonable time, any relevant information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Permit, or to determine compliance with this Permit. The Permittee shall also furnish to the Director, upon request, copies of records required to be kept by this Permit. [MHWMR 264.74(a), 270.30(h)]

I.E.9 Inspection and Entry

Pursuant to MHWMR 270.30(i), the Permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents, as may be required by law, to:

1.E.9.a 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 conditions of this Permit;

I.E.9.b Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Permit;

1.E.9.c Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Permit; and

I.E.9.d Sample or monitor, at reasonable times, for the purposes of assuring Permit compliance or as otherwise authorized by

MSWDL, any substances or parameters at any location.

I.E.10 Monitoring and Records

The Director may require such testing by the Permittee, and may make such modifications to this permit, deemed necessary to ensure implementation of new regulations or requirements, or to ensure protection of human health and the environment.

I.E.10.a Samples and measurements taken. for the purpose of monitoring shall be representative of the monitored activity. The method used to obtain a representative sample of the waste to be analyzed must be the appropriate method from Appendix I of MHWMR Part 261 or an equivalent method approved by the Director. Laboratory methods must be those specified in *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods SW-846, Standard Methods of Wastewater Analysis,* or an equivalent method, as specified in the Sample and Analysis Plan (See Permit Attachment 111-2). [MHWMR 270.300)(1)]

I.E.10.b 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 MHWMR 264.73(b)(9), and records of all data used to complete the application for this Permit for a period of at least 3 years from the date of the sample, measurement, report, record, certification, or application, or until corrective action is completed, whichever date is later. As a generator of hazardous waste, the Permittee shall retain a copy of all notices, certifications, demonstrations, waste analysis data, and other documentation produced pursuant to MHWMR Part 268 for at least five years from the date that the waste which is the subject of such documentation was last sent to on-site or off-site treatment, storage, or disposal; or until corrective action is completed, whichever date is later. These periods may be extended by request of the Director at any time and are automatically extended during the course of any unresolved enforcement action regarding this facility. [MHWMR 264.74(b) and 270.300)(2)]

I.E.10.c Pursuant to MHWMR 270.300)(3), records of monitoring information shall specify:

I.E.10.c.i The dates, exact place, and times of sampling or measurements;

I.E.10.c.ii The individuals who performed the sampling or measurements;

1.E.10.c.iii The dates analyses were performed;

I.E.l0.c.iv The individuals who performed the analyses;

1.E.10.c.v The analytical techniques or methods used; and

1.E.10.c.vi The results of such analyses.

I.E.11 Reporting Planned Changes

The Permittee shall give notice to the Director as soon as possible of any planned physical alterations or additions which impact any SWMUs, AOCs, or the areas contaminated by them, including voluntary corrective measures, to the SWMUs or AOCs referenced in Conditions VI.A.3, VI.A.4, VI.A.5, and VI.C at the permitted facility as defined in MHWMR 270.2.

I.E.12 Reporting Anticipated Noncompliance

The Permittee shall give advance notice to the Director or any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. [MHWMR 270.30(1)(2)]

I.E.13 Transfer of Permits

This Permit is not transferable to any person, except after notice to the Director. The Director may require modification or revocation and reissuance of the Permit pursuant to MHWMR 270.40. Before transferring ownership or operation of the facility during its operating life, the Permittee shall notify the new owner or operator in writing of the requirements of MHWMR Parts 264 and 270 and this Permit. [MHWMR 270.30(1)(3), 264.12(c)]

I.E.14 Compliance Schedules

Written notification of compliance or noncompliance with any item identified in the compliance schedule of this permit shall be submitted according to each schedule date. If the Permittee does not notify the Director within fourteen (14) calendar days of its compliance or non compliance with the schedule, the Permittee shall be subject to an enforcement action. Submittal of a required item according to the schedule constitutes notification of compliance.

I.E.15 Twenty-Four Hour Reporting

I.E.15.a The Permittee shall report to the, Director any noncompliance which may endanger health or the environment. Any such information shall be reported orally within 24 hours from the time the Permittee becomes aware of the circumstances. The report shall include the following:

I.E.15.ai Information concerning release of any hazardous waste that may cause an endangerment to public drinking water supplies.

I.E.15.a.ii Any information of a release or discharge of hazardous waste, or of a fire or explosion from the hazardous waste management facility which could threaten the environment or human health outside the facility.

I.E.15.b The description of the occurrence and its cause shall include:

1.E.15.b.i Name, address, and telephone number of the owner or operator;

I.E.15.b.ii Name, address, and telephone number of the facility;

I.E.15.b.iii Date, time, and type of incident;

1.E.15.b.iv Name and quantity of materials involved;

1.E.15.b.v The extent of injuries, if any;

1.E.15.b.vi An assessment of actual or potential hazards to the environment and human health outside the facility, where this is applicable; and

I.E.15.b.vii Estimated quantity and disposition of recovered material that resulted from the incident.

I.E.15.c A written submission shall also be provided within five days of the time the Permittee becomes aware of the circumstances. The written submission shall contain a description of the 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 reduce, eliminate, and prevent recurrence of the noncompliance. The Director may waive the five-day written notice requirement in favor of a written report within 15 days. [MHWMR 270.30(1)(6)]

I.E.16 Other Noncompliance

The Permittee shall report all other instances of noncompliance not otherwise required to be reported above, Permit Conditions I.E.11- 1.E.16., at the time monitoring reports are submitted. The reports shall contain the information listed in Permit Condition I.E.15 [MHWMR 270.30(1)(10)]

I.E.17 Other Information

Whenever the Permittee becomes aware that it failed to submit any relevant facts in the Permit application, or submitted incorrect information in a Permit application or in any report to the Director, the Permittee shall promptly submit such facts or information. [MHWMR 270.J0(l)(l 1)]

I.F SIGNATORY REQUIREMENT

All applications, reports, or information submitted to or requested by the Director,

his designee, or authorized representative, shall be signed and certified in accordance with MHWMR 270.11 and 270.30(k).

I.G. REPORTS, NOTIFICATIONS, AND SUBMISSIONS TO THE DIRECTOR

All reports, notifications, or other submissions that are required by this permit are to be given or sent by certified mail, delivery service, or by email to the Hazardous Waste Branch Manager at the following addresses:

Physical and P.O. Addresses:
Mississippi Department of Environmental Quality
Hazardous Waste Branch
515 E. Amite Street
Jackson, Mississippi 39201

or

P.O. Box 2261
Jackson, Mississippi 39225

Email Address:
HazardousWasteBranch@mdeq.ms.gov

I.H CONFIDENTIAL INFORMATION

Unless otherwise requested, all information provided to the Commission, Department, or the Permit Board is subject to public review. Where the Permittee believes information is confidential, the Permittee must provide a written confidentiality claim when the information is supplied in accordance with Title 11 Miss. Admin. Code Pt. 1 Ch. 2 Mississippi Commission on Environmental Quality Regulations Regarding the Review and Reproduction of Public Records Rule 2.7. Any confidentiality claim must allow disclosure of the confidential information to authorized department employees and/or the United States Environmental Protection Agency (EPA).

Such confidentiality claim must be determined by the Commission to be valid. If the confidentiality claim is denied, the information sought to be covered by the Permittee thereby shall not be released or disclosed, except to the Environmental Protection Agency, until the claimant has been notified in writing and afforded an opportunity for a hearing and appeal therefrom, as with other orders of the commission. Disclosure of confidential information by the EPA is governed by federal law and EPA regulations.

MODULE II - GENERAL FACILITY CONDITIONS

II.A. DESIGN AND OPERATION OF FACILITY

The Permittee shall 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, or surface water that could threaten human health or the environment, as required by MHWMR 264.31.

II.B. SECURITY

The Permittee shall comply with the security provisions of MHWMR 264.l4(b)(2) and (c) and the Post-Closure Plan, Permit Attachment II-1.

II.C. LOCATION STANDARDS

The Permittee's facility does lie in the 100 year flood plain. However, the Permittee has demonstrated to the satisfaction of the Director that, should a washout occur, the remaining levels of contaminated soil would not cause an adverse effect on human health or the environment at the site or downstream. This demonstration was provided in the post-closure Part B permit application of May 22, 1987, and the Impoundment Closure Report of December 1986.

II.C.1 Should a washout occur during the Post-Closure period, such a release will constitute a release as defined in Condition I.D.12 and must be reported as required by Condition I.E.15.

II.D. GENERAL INSPECTION REQUIREMENTS

The Permittee shall follow the inspection schedule set out in the Post-Closure Plan, Permit Attachment II-1. The Permittee shall remedy any deterioration or malfunction discovered by an inspection, as required by MHWMR.264.15(c). Records of inspection shall be kept, as required by MHWMR 264.15(d).

II.E. RECORD KEEPING AND REPORTING

In addition to the record keeping and reporting requirements specified elsewhere in this Permit, the Permittee shall do the following:

II.E.1 Operating Record
The Permittee shall maintain a written operating record at the facility, in accordance with MHWMR 264.73.

II.E.2 Annual Report
The Permittee shall comply with the biennial reporting requirements of MHWMR 264.Sl.

II.F. GENERAL POST-CLOSURE REQUIREMENTS

II.F.1 Post-Closure Care Period

The Permittee shall begin post-closure care for each surface impoundment

after completion of closure of the unit and continue for 30 years after that date. Post-closure care shall be in accordance with MHWMR 264.117 and the Post-Closure Plan, Permit Attachment II-1.

II.F.2 Post-Closure Security

The Permittee shall maintain security at the facility during the post-closure care period, in accordance with the Post-Closure Plan, Permit Attachment II-1, and MHWMR 264.ll 7(b).

II.F.3 Amendment to Post-Closure Plan

The Permittee shall amend the Post-Closure Plan in accordance with MHWMR 264.118(d), whenever necessary.

II.F.4 Post-Closure Notices

The Permittee shall request and obtain a Permit modification prior to post-closure removal of hazardous wastes, hazardous waste residues, liners, or contaminated soils, in accordance with MHWMR 264.119(c).

II.F.5 Certification of Completion of Post-Closure Care

The Permittee shall certify that the post-closure care period was performed in accordance with the specifications in the Post-Closure Plan, as required by MHWMR 264.120.

II.G. COST ESTIMATE FOR FACILITY CLOSURE POST-CLOSURE

II.G.1 The Permittee' s most recent post-closure cost estimate, prepared in accordance with MHWMR 264.144 is specified in the Post-Closure Plan, Permit Attachment II-1.

II.G.2 The Permittee must revise the post-closure cost estimate whenever there is a change in the facility's Post-Closure Plan, as required by MHWMR 264.144(c).

II.G.3 The Permittee must keep at the facility the latest post-closure cost estimate as required by MHWMR 264.144(d).

II.H. FINANCIAL ASSURANCE FOR FACILITY POST-CLOSURE

The Permittee shall demonstrate continuous compliance with MHWMR 264.145 by providing documentation of financial assurance, as required by MHWMR 264.151 or 264.149, in at least the amount of the cost estimates required by Permit Condition II.G. Changes in financial assurance mechanisms must be approved by the Director pursuant to MHWMR 264.145 or 264.149.

II.I. INCAPACITY OF OWNERS OR OPERATORS. GUARANTORS. OR FINANCIAL INSTITUTIONS

The Permittee shall comply with MHWMR 264.148, whenever necessary.

MODULE III –GROUND WATER DETECTION MONITORING

A Class 2 permit modification issued on February 10, 2022, removed the requirements of Module III from the permit. The removal of Module III was justified based on over thirty years of semi-annual groundwater monitoring data. The groundwater data has demonstrated satisfaction of the post-closure permit requirements and that conditions remain stable. There is no evidence of any significant release from the closed surface impoundment. Greenfield Environmental Multistate Trust will continue to maintain monitoring wells in working condition according to the Post-Closure Plan (Attachment II-1) and Sampling and Analysis Plan (Attachment III-2).

MODULE IV -POST-CLOSURE CARE

IV.A. MODULE HIGHLIGHTS

This module covers the post-closure care activities for the Permittee's closed surface impoundment. The closed surface impoundment was used in the treatment of wastewater from the wood preserving process. The sediment and sludge that accumulated in the impoundment met the K00l RCRA hazardous waste listing. The impoundment was closed in November of 1986 and the facility is to conduct post-closure care for 30 years from that date. Module III of this permit covers the requirements for detection monitoring that the facility is required to conduct during the post-closure care period.

IV.B. UNIT IDENTIFICATION

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

Type of Waste Unit	Maximum Waste Inventory	Description of Wastes Contained	Hazardous Waste No.
Waste Storage Impoundment	2,416,519 gallons	Bottom sediment sludge from the treatment of wastewater from wood preserving processes that use creosote and/or pentachlorophenol	K00l

IV.C. POST-CLOSURE PROCEDURES AND USE OF PROPERTY

IV.C.1 The Permittee shall conduct post-closure care for each hazardous waste management unit listed in Permit Condition IV.B. 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 MDEQ that the facility is secure, or may be extended by MDEQ if the Director finds this is necessary to protect human health and the environment. [MHWMR 264.117(a)]

IV.C.2 The Permittee shall maintain and monitor the ground-water monitoring system and comply with all other applicable requirements of MHWMR Part 264 Subpart F during the post-closure period. [MHWMR 264.117(a)(l)]

IV.C.3 The Permittee shall comply with the requirements for surface impoundments as follows: [MHWMR 264.228(b)(l) and (3)]

IV.C.3.a 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

IV.C.3.b Prevent run-on and run-off from eroding or otherwise damaging the final cover.

IV.C.4 The Permittee shall comply with all security requirements, as specified in the Post-Closure Plan, Permit Attachment II-I. [MHWMR 264.l17(b)]

IV.C.5 The Permittee shall not allow any use of the units designated in Permit Condition IV.B. 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. [MHWMR. 264.117(c)]

IV.C.6 The Permittee shall implement the Post-Closure Plan, Permit Attachment II-I. All post-closure care activities must be conducted in accordance with the provisions of the Post-Closure Plan. [MHWMR264.l 17(d) and 264.l IS(b)]

IV.D. INSPECTIONS

The Permittee shall inspect the components, structures, and equipment at the site in accordance with the inspection schedule included in the Post-Closure Plan, Permit Attachment II-I. [MHWMR 264.l 17(a)(l)(ii)]

IV.E. NOTICES AND CERTIFICATION

IV.E.1 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 MHWMR Parts 124 and 270. The Permittee or any subsequent owner or operator of the land shall demonstrate that the removal of hazardous wastes will satisfy the criteria of MHWMR 264.117(c). [MHWMR 264.l19(c)]

IV.E.2 No later than 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 MHWMR 264.145(1). [MHWMR264.120]

IV.F. FINANCIALASSURANCE

IV.F.1 The Permittee shall maintain financial assurance during the post-closure period and comply with all applicable requirements of MHWMR Part 264

Subpart H. [MHWMR 264.145]

IV.G. 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 MHWMR Parts 124 and 270, 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 60 days prior to the proposed change in facility design or operation, or no later than 60 days after an unexpected event has occurred which has affected the Post-Closure Plan. [MHWMR 264.118(d)]

MODULE V - ORGANIC AIR EMISSION REQUIREMENTS FOR PROCESS VENTS AND EQUIPMENT LEAKS

V.A. GENERAL INTRODUCTION

V.A.1 In the June 21, 1990, Federal Register, EPA published the final rule for Phase I Organic Air Emission Standards (40 CFR Parts 264 and 265, Subparts AA and BB) for hazardous waste treatment, storage, and disposal facilities. Phase II Organic Air Emission Standards (40 CFR Parts 264 and 265, Subpart CC) was published in the Federal Register on December 6, 1994. The State of Mississippi adopted Subparts AA and BB in September 1990 and Subpart CC in December 2000. Subpart AA contains emission standards for process vents associated with distillation, fractionation, thin-film evaporation, solvent extraction, and air or steam stripping operations that process hazardous waste with an annual average total organic concentration of at least ten (10) parts per million (ppm) by weight. Subpart BB contains emission standards that address leaks from specific equipment (i.e. pumps, valves, compressors, etc.) that contains or contacts hazardous waste that has an organic concentration of at least ten (10) percent by weight. Subpart CC contains emissions standards for tanks, surface impoundments, or containers for which all hazardous waste entering a unit has an average volatile organic concentration at the point of waste origination of less than 500 parts per million (ppm) by weight.

V.B. ORGANIC AIR EMISSION STANDARDS

V.B.1 Prior to constructing any equipment with process vents subject to the requirements of MHWMR Rule 1.7 Part 264, Subpart AA, or installing any additional equipment subject to the requirements of MHWMR Rule 1.7 Part 264, Subpart BB, or installing any tanks, surface impoundments, and containers subject to the requirements of MHWMR Rule 1.7 Part 264, Subpart CC, the Permittee shall supply the specific Part B information required pursuant to MHWMR Rule 1.16 Part 270.24, Part 270.25, and Part 270.27, as applicable.

MODULE VI -CORRECTIVE ACTION

VI.A APPLICABILITY

The Conditions of this Part apply to:

IV.A.1 The Kerr-McGee Chemical, LLC, Meridian, Mississippi Facility located on Highway 11 South. The SWMUs and AOCs identified in Attachment VI-1, which require no further investigation under this permit at this time; The SWMUs and AOCs identified in Attachment VI-2, which require confirmatory sampling;Any additional SWMUs or AOCs discovered during the course of groundwater monitoring, field investigations, environmental audits, or other means; As used in this Part of the permit, the terms "discover", "discovery", or "discovered" refer to the date on which the Permittee either, (1) visually observes evidence of a new SWMU or AOC, (2) visually observes evidence of a previously unidentified release of hazardous constituents to the environment, or (3) receives information which suggests the presence of a new release of hazardous waste or hazardous constituents to the environment;Contamination that has migrated beyond the facility boundary, if applicable. The Permittee shall implement corrective actions beyond the facility boundary where necessary to protect human health and the environment, unless the Permittee demonstrates to the satisfaction of the Director that, despite the Permittee's best efforts, as determined by the Director, the Permittee was unable to obtain the necessary permission to undertake such actions. The Permittee is not relieved of all responsibility to clean up a release that has migrated beyond the facility boundary where off-site access is denied. On-site measures to address such releases will be determined on a case-by-case basis. Assurances of financial responsibility for completion of such off-site corrective action will be required.

VI.B NOTIFICATION AND ASSESSMENT REQUIREMENTS FOR NEWLY IDENTIFIED SWMUs AND AOCs

VI.B.1 The Permittee shall notify the Director in writing, within fifteen (15) calendar days of discovery, of any suspected new AOC as discovered under Condition VI.A.4. The notification shall include, at a minimum, the location of the AOC and all available information pertaining to the nature of the release (e.g., media affected, hazardous constituents released, magnitude of release, etc.). The Director may conduct, or require the Permittee to conduct, further assessment (i.e., Confirmatory Sampling) in order to determine the status of the suspected AOC. The Director will notify the Permittee.in writing of the final determination as to the status of the suspected AOC. If the Director determines that further investigation of an AOC is required, the permit will be modified in accordance with MHWMR §270.41.

VI.B.2 The Permittee shall notify the Director in writing, within fifteen (15) calendar days of discovery, of any additional SWMU as discovered under Condition VI.A.4.

VI.B.3 The Permittee shall prepare and submit to the Director, within ninety (90) calendar days of notification, a SWMU Assessment Report (SAR) for each SWMU identified under Condition VI.B.2. At a minimum, the SAR shall provide the following information:

VI.B.3.a Location of unit(s) on a topographic map of appropriate scale such as required under MHWMR §270.14(b)(19).

VI.B.3.b Designation of type and function of unit(s).

VI.B.3.c General dimensions, capacities and structural description of unit(s) (supply any available plans/drawings).

VI.B.3.d Dates that the unit(s) was operated.

VI.B.3.e Specification of all wastes that have been managed at/in the unit(s) to the extent available. Include any available data on hazardous constituents in the wastes.

VI.B.3.f All available information pertaining to any release of hazardous waste or hazardous constituents from such unit(s) (to include groundwater data, soil analyses, air, and/or surface water data).

VI.B.4 Based on the results of the SAR the Director shall determine the need for further investigations at the SWMUs covered in the SAR. If the Director determines that such investigations are needed, the Permittee shall be required to prepare a plan for such investigations as outlined in Condition VI.E.1.a or VI.D.1.

VI.C NOTIFICATION REQUIREMENTS FOR NEWLY DISCOVERED RELEASES FROM SWMUs or AOCs

VI.C.1 The Permittee shall notify the Director in writing of any newly discovered release(s) of hazardous waste or hazardous constituents discovered during the course of groundwater monitoring, field investigations, environmental audits, or other means, within fifteen (15) calendar days of discovery. Such newly discovered releases may be from SWMUs or AOCs identified in Condition VI.A.2. or SWMU or AOCs identified in Condition VI.A.4 for which further investigation under Condition VI.B.4 was not required.

VI.C.2 If the Director determines that further investigation of the SWMUs or AOCs is needed, the Permittee shall be required to prepare a plan for such investigations as outlined in Condition VI.E.1.a.

VI.D CONFIRMATORY SAMPLING (CS)

VI.D.1 The Permittee shall prepare and submit to the Director within ninety (90) calendar days of notification by the Director for a newly identified SWMU, a Confirmatory Sampling (CS) Work Plan to determine any release from

SWMUs or AOCs identified. The CS Work Plan shall include schedules of implementation and completion of specific actions necessary to determine whether or not a release has occurred. It should also address applicable requirements and affected media. In order to partly or wholly satisfy the CS requirement, the use of data obtained outside of the permit structure may be submitted with the work plan for the Director's review and approval. Within forty-five (45) calendar days of notification by the Director, the Permittee shall prepare and submit to the Director a CS Work Plan to determine if any release has occurred from suspected AOCs per Condition VI.B.1 or newly identified SWMUs per Condition VI.B.4.

VI.D.2 The CS Work Plan must be approved by the Director, in writing, prior to implementation. The Director shall specify the start date of the CS Work Plan schedule in the letter approving the CS Work Plan. If the Director disapproves the CS Work Plan, the Director shall either (1) notify the Permittee in writing of the CS Work Plan's deficiencies and specify a due date for submission of a revised CS Work Plan, (2) revise the CS Work Plan and notify the Permittee of the revisions, or (3) conditionally approve the CS Work Plan and notify the Permittee of the conditions.

VI.D.3 The Permittee shall implement the confirmatory sampling in accordance with the approved CS Work Plan.

VI.D.4 The Permittee shall prepare and submit to the Director in accordance with the schedule in the approved CS Work Plan, a Confirmatory Sampling (CS) Report identifying those SWMUs or AOCs listed in Condition VI.A.3 that have released hazardous waste or hazardous constituents into the environment. The CS Report shall include all data, including raw data, and a summary and analysis of the data that supports the above determination.

VI.D.5 Based on the results of the CS Report, the Director shall determine the need for further investigations at the SWMUs or AOCs covered in the CS Report. If the Director determines that such investigations are needed, the Permittee shall be required to prepare a plan for such investigations as outlined in Condition VI.E.I.a. The Director will notify the Permittee of any no further action decision.

VI.E RCRA FACILITY INVESTIGATION (RFI)

VI.E.1 RFI Work Plan(s)

VI.E.1.a The Permittee shall prepare and submit to the Director, within one hundred-twenty (120) calendar days of notification by the Director, an RFI Work Plan for those units identified under Condition VI.B.4, Condition VI.C.2, or Condition VI.D.5. The RFI Work Plan(s) shall be developed to meet the requirements of Condition VI.E.1.b.

VI.E.1.b The RFI Work Plan(s) shall meet the requirements of Attachment VI-3. The RFI Work Plan(s) shall include schedules of implementation and completion of specific actions necessary to

determine the nature and extent of contamination and the potential pathways of contaminant releases to the air, soil, surface water, and groundwater. The Permittee must provide sufficient justification and associated documentation that a release is not probable or has already been characterized if a unit or a media/pathway associated with a unit (groundwater, surface water, soil, subsurface gas, or air) is not included in the RFI Work Plan(s). Such deletions of a unit, media or pathway from the RFl(s) are subject to the approval of the Director. The Permittee shall provide sufficient written justification for any omissions or deviations from the minimum requirements of Attachment VI-3. Such omissions or deviations are subject to the approval of the Director. In addition, the scope of the RFI Work Plan(s) shall include all investigations necessary to ensure compliance with MHWMR §264.101(c).

VI.E.1.c The RFI Work Plan(s) must be approved by the Director, in writing, prior to implementation. The Director shall specify the start date of the RFI Work Plan schedule in the letter approving the RFI Work Plan(s). If the Director disapproves the RFI Work Plan(s), the Director shall either (1) notify the Permittee in writing of the RFI Work Plan's deficiencies and specify a due date for submission of a revised RFI Work Plan, (2) revise the RFI Work Plan and notify the Permittee of the revisions and the start date of the schedule within the approved RFI Work Plan, or (3) conditionally approve the RFI Work Plan and notify the Permittee of the conditions.

VI.E.2 RFI Implementation

The Permittee shall implement the RFl(s) in accordance with the approved RFI Work Plan(s) and Attachment VI-3. The Permittee shall notify the Director within twenty (20) days prior to any sampling activity.

VI.E.3 RFI Reports

VI.E.3.a If the time required to conduct the RFl(s) is greater than one hundred eighty (180) calendar days, the Permittee shall provide the Director with quarterly RFI Progress Reports (90 day intervals) beginning ninety (90) calendar days from the start date specified by the Director in the RFI Work Plan approval letter. The Progress Reports shall contain the following information at a minimum:

VI.E.3.a.i A description of the portion of the RFI completed;

VI.E.3.a.ii Summaries of findings;

VI.E.3.a.iii Summaries of any deviations from the approved RFI Work Plan during the reporting period;

VI.E.3.a.iv Summaries of any significant contacts with local community public interest groups or State government;

VI.E.3.a.v Summaries of any problems or potential problems encountered during the reporting period;

VI.E.3.a.vi Actions taken to rectify problems;

VI.E.3.a.vii Changes in relevant personnel;

VI.E.3.a.viii Projected work for the next reporting period; and

VI.E.3.a.ix Copies of daily reports, inspection reports, data, etc.

VI.E.3.b The Permittee shall prepare and submit to the Director Draft and Final RCRA Facility Investigation Report(s) for the investigations conducted pursuant to the RFI Work Plan(s) submitted under Condition VI.E.l. The Draft RFI Report(s) shall be submitted to the Director for review in accordance with the schedule in the approved RFI Work Plan(s). The Final RFI Report(s) shall be submitted to the Director within thirty (30) calendar days of receipt of the Director's final comments on the Draft RFI Report. The RFI Report(s) shall include an analysis and summary of all required investigations of SWMUs and AOCs and their results. The summary shall describe the type and extent of contamination at the facility, including sources and migration pathways, identify all hazardous constituents present in all media, and describe actual or potential receptors. The RFl Report(s) shall also describe the extent of contamination (qualitative/quantitative) in relation to background levels indicative of the area. If the Draft RFI Report is a summary of the initial phase investigatory work, the report shall include a work plan for the final phase investigatory actions required based on the initial findings. Approval of the final phase work plan shall be carried out in accordance with Condition VI.E.l.c. The objective of this task shall be to ensure that the investigation data are sufficient in quality (e.g., quality assurance procedures have been followed) and quantity to describe the nature and extent of contamination, potential threat to human health and/or the environment, and to support a Corrective Measures Study, if necessary.

VI.E.3.c The Permittee shall prepare and submit to the Director, along with the Draft and Final RFI Report(s), action levels for each of the hazardous constituents reported in Condition VI.E.3.b.

VI.E.3.d The Director will review the RFI Report(s), including the action levels described in Condition VI.E.3.c. The Director shall notify the Permittee of the need for further investigative action if necessary and, if appropriate at this moment of the

investigation, inform the Permittee, if not already notified, of the need for a Corrective Measures Study to meet the requirements of VI.G and MHWMR §264.101. The Director will notify the Permittee of any no further action decision. Any further investigative action required by the Director shall be prepared and submitted in accordance with a schedule specified by the Director and approved in accordance with Condition VI.E.1.c. The Director may require a Corrective Measures Study if action levels are exceeded.

VI.F INTERIM MEASURES (IM)

VI.F.1 IM Work Plan

VI.F.1.a Upon notification by the Director, the Permittee shall prepare and submit an Interim Measures (IM) Work Plan for any SWMU or AOC which the Director determines is necessary. IM are necessary in order to minimize or prevent the further migration of contaminants thereby limiting current and future potential for human and environmental exposure to contaminants while long-term corrective action remedies are evaluated and, if necessary, implemented. The IM Work Plan shall be submitted within sixty (60) calendar days of such notification and shall include the elements listed in VI.F.1.b Such interim measures may be conducted concurrently with investigations required under the terms of this permit. The Permittee may initiate IM by submitting an IM Work Plan for approval and reporting in accordance with the requirements under Condition VI.F.

VI.F.1.b The IM Work Plan shall ensure that the interim measures are designed to mitigate any current or potential threat(s) to human health or the environment and is consistent with and integrated into any long-term solution at the facility. The IM Work Plan shall include: the interim measures objectives, procedures for implementation (including any designs, plans, or specifications), and schedules for implementation.

VI.F.1.c The IM Work Plan must be approved by the Director, in writing, prior to implementation. The Director shall specify the start date of the IM Work Plan schedule in the letter approving the IM Work Plan. If the Director disapproves the IM Work Plan, the Director shall either (1) notify the Permittee in writing of the IM Work Plan's deficiencies and specify a due date for submission of a revised IM Work Plan, (2) revise the IM Work Plan and notify the Permittee of the revisions and the start date of the schedule within the approved IM Work Plan, or (3) conditionally approve the IM Work Plan and notify the Permittee of the conditions.

VI.F.2 IM Implementation

VI.F.2.a The Permittee shall implement the interim measures in accordance with the approved IM Work Plan.

VI.F.2.b The Permittee shall give notice to the Director as soon as possible of any planned changes, reductions or additions to the IM Work Plan.

VI.F.2.c Final approval of corrective action required under MHWMR §264.101 which is achieved through interim measures shall be in accordance with MHWMR §270.41 and Condition. VI.H as a permit modification.

VI.F.3 IM Reports

VI.F.3.a If the time required for completion of interim measures is greater than one year, the Permittee shall provide the Director with progress reports at intervals specified in the approved Work Plan. The Progress Reports shall contain the following information at a minimum:

VI.F.3.a.i A description of the portion of the interim measures completed;

VI.F.3.a.ii Summaries of any deviations from the IM Work Plan during the reporting period;

VI.F.3.a.iii Summaries of any problems or potential problems encountered during the reporting period,

VI.F.3.a.iv Projected work for the next reporting period; and

VI.F.3.a.v Copies of laboratory/monitoring data.

VI.F.3.b The Permittee shall prepare and submit to the Director, within ninety (90) calendar days of completion of interim measures conducted under Condition VI.F, an Interim Measures (IM) Report. The IM Report shall contain the following information at a minimum:

VI.F.3.b.i A description of interim measures implemented;

VI.F.3.b.ii Summaries of results;

VI.F.3.b.iii Summaries of all problems encountered;

VI.F.3.b.iv Summaries of accomplishments and/or effectiveness of interim measures; and

VI.F.3.b.v Copies of all relevant laboratory/monitoring data, etc. in accordance with Condition I.E.10

VI.G CORRECTIVE MEASURES STUDY

VI.G.1 Corrective Measures Study (CMS) Work Plan

VI.G.1.a The Permittee shall prepare and submit a CMS Work Plan for those units requiring a CMS within ninety (90) calendar days of notification by the Director that a CMS is required. This CMS Work Plan shall be developed to meet the requirements of Condition VI.G.1.b.

VI.G.1.b The CMS Work Plan shall meet the requirements of Attachment VI-4 at a minimum. The CMS Work Plan shall include schedules of implementation and completion of specific actions necessary to complete a CMS. The Permittee must provide sufficient justification and/or documentation for any unit deleted from the CMS Work Plan. Such deletion of a unit is subject to the approval of the Director. The CMS shall be conducted in accordance with the approved CMS Work Plan. The Permittee shall provide sufficient written justification for any omissions or deviations from the minimum requirements of Attachment VI-4. Such omissions or deviations are subject to the approval of the Director. The scope of the CMS Work Plan shall include all investigations necessary to ensure compliance with 3005(c)(3), MHWMR §264.101, §264.552, and §270.32(b)(2). The Permittee shall implement corrective actions beyond the facility boundary, as set forth in Condition VI.A.5.

VI.G.1.c The Director shall either approve or disapprove, in writing, the CMS Work Plan. If the Director disapproves the CMS Work Plan, the Director shall either (1) notify the Permittee in writing of the CMS Work Plan's deficiencies and specify a due date for submittal of a revised CMS Work Plan, (2) revise the CMS Work Plan and notify the Permittee of the revisions, or (3) conditionally approve the CMS Work Plan and notify the Permittee of the conditions. This modified CMS Work Plan becomes the approved CMS Work Plan.

VI.G.2 Corrective Measures Study Implementation

The Permittee shall begin to implement the Corrective Measures Study according to the schedules specified in the CMS Work Plan, no later than thirty (30) calendar days after the Permittee has received written approval from the Director for the CMS Work Plan. Pursuant to Permit Condition VI.G.l.b. the CMS shall be conducted in accordance with the approved CMS Work Plan.

VI.G.3 CMS Report

VI.G.3.a The Permittee shall prepare and submit to the Director a draft and final CMS Report for the study conducted pursuant to the approved CMS Work Plan. The draft-CMS Report shall be submitted to the Director in accordance with the schedule in the approved CMS Work Plan. The final CMS Report shall be

submitted to the Director within thirty (30) days of receipt of the Director's final comments on the draft CMS Report. The CMS Report shall summarize any bench-scale or pilot tests conducted. The CMS Report must include an evaluation of each remedial alternative. If a remedial alternative requires the use of a CAMU, the CMS report shall include all information necessary to establish and implement the CAMU. The CMS Report shall present all information gathered under the approved CMS Work Plan. The CMS Final Report must contain adequate information to support the Director's decision on the recommended remedy, described under Permit Condition VI.H.

VI.G.3.b If the Director determines that the CMS Final Report does not fully satisfy the information requirements specified under Permit Condition VI.G.3.a., the Director may disapprove the CMS Final Report. If the Director disapproves the CMS Final Report, the Director shall notify the Permittee in writing of deficiencies in the CMS Final Report and specify a due date for submittal of a revised CMS Final Report. The Director will notify the Permittee of any no further action decision.

VI.G.3.c As specified under Permit Condition VI.G.3.b., based on preliminary results and the CMS Final Report, the Director may require the Permittee to evaluate additional remedies or particular elements of one or more proposed remedies.

VI.H REMEDY APPROVAL AND PERMIT MODIFICATION

VI.H.1 A remedy shall be selected from the remedial alternatives evaluated in the CMS. It will be based at a minimum on protection of human health and the environment, as per specific site conditions, existing regulations, and guidance. The selected remedy may include any interim measures implemented to date.

VI.H.2 Pursuant to MHWMR §270.41, a permit modification will be initiated by the Director after recommendation of a remedy under Condition VI.H.1. This modification will serve to incorporate a final remedy, including a CAMU if necessary, into this permit.

VI.H.3 Within one hundred and twenty (120) calendar days after this Permit has been modified for remedy selection, the Permittee shall demonstrate financial assurance for completing the approved remedy.

VI.I MODIFICATION OF THE CORRECTIVE ACTION SCHEDULE OF COMPLIANCE

VI.I.1 If at any time the Director determines that modification of the Corrective Action Schedule of Compliance is necessary, the Director may initiate a modification to the Schedule of Compliance (Attachment VI-5).

VI.I.2 Modifications that are initiated and finalized by the Director will be in accordance with the applicable provisions of MHWMR Part 270. The Permittee may also request a permit modification in accordance with MHWMR Part 270 to change the Schedule of Compliance.

VI.J IMMINENT HAZARDS

VI.J.1 The Permittee shall report to the Director any imminent or existing hazard to public health or the environment from any release of hazardous waste or hazardous constituents. Such information shall be reported orally within 24 hours from such time the Permittee becomes aware of the circumstances. This report shall include the information specified under Conditions I.E.15.a and I.E.15.b.

VI.J.2 A written report shall also be provided to the Director within fifteen (15) calendar days of the time the Permittee becomes aware of the circumstances. The written report shall contain the information specified under Conditions I.E.15.a and I.E.15.b; a description of the release and its cause; the period of the release; whether the release has been stopped; and if not, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the release.

VI.K WORK PLAN AND REPORT REQUIREMENTS

VI.K.1 All work plans and schedules shall be subject to approval by the Director prior to implementation to assure that such work plans and schedules are consistent with the requirements of this Permit and with applicable regulations and guidance. The Permittee shall revise all submittals and schedules as specified by the Director. Upon approval the Permittee shall implement all work plans and schedules as written.

VI.K.2 All work plans and reports shall be submitted in accordance with the approved schedule. Extensions of the due date for submittals may be granted by the Director based on the Permittee's demonstration that sufficient justification for the extension exists.

VI.K.3 If the Permittee at any time determines that the SAR information required under Condition VI.B., the CS Work Plan under Condition VI.D., or RFI Work Plan(s) required under Condition VI.E. no longer satisfy the requirements of MHWMR §264.101 or this permit for prior or continuing releases of hazardous waste or hazardous constituents from solid waste management units and/or areas of concern, the Permittee shall submit an amended Work Plan(s) to the Director within ninety (90) calendar days of such determination.

VI.K.4 All reports shall be signed and certified in accordance with MHWMR §270.11.

VI.K.5 Three (3) copies of all reports and work plans shall be provided by the Permittee to the Director at the following address:

Hazardous Waste Branch, Chief
Mississippi Office of Pollution Control
P. O. Box 2261
Jackson, Mississippi 39225

VI.L APPROVAL/DISAPPROVAL OF SUBMITTALS

VI.L.1 The Director will review the work plans, reports, schedules, and other documents ("submittals") which require the Director's approval in accordance with the conditions of this permit. The Director will notify the Permittee in writing of any submittal that is disapproved, and the basis therefore. Condition VI.M. shall apply only to submittals that have been disapproved and revised by the Director, or that have been disapproved by the Director, then revised and resubmitted by the Permittee, and again disapproved by the Director.

VI.M DISPUTE RESOLUTION

Notwithstanding any other provision in this permit, in the event the Permittee disagrees, in whole or in part, with the Director's revision of a submittal or disapproval of any revised submittal required by the permit, the following may, at the Permittee's discretion apply:

VI.M.1 In the event that the Permittee chooses to invoke the provisions of this section, the Permittee shall notify the Director in writing within thirty (30) days of receipt of the Director's revision of a submittal or disapproval of a revised submittal. Such notice shall set forth the specific matters in dispute, the position-the Permittee asserts should be adopted as consistent with the requirements of the permit, the basis for the Permittee's position, and any matters considered necessary for the Director's determination.

VI.M.2 The Director and the Permittee shall have an additional thirty (30) days from EPA's receipt of the notification provided for in Condition VI.M.1. to meet or confer to resolve any disagreement.

VI.M.3 In the event agreement is reached, the Permittee shall submit the revised submittal and implement the same in accordance with and within the time frame specified in such agreement.

VI.M.4 If agreement is not reached within the thirty (30) day period, the Director will notify the Permittee in writing of his/her decision on the dispute, and the Permittee shall comply with the terms and conditions of the Director's decision in the dispute. For the purposes of this provision in this permit, the responsibility for making this decision shall not be delegated below the Waste Management Division Director.

VI.M.5 With the exception of those conditions under dispute, the Permittee shall proceed to take any action required by those portions of the submission and of the permit that the Director determines are not affected by the dispute.

MODULE VII-WASTE MINIMIZATION

VII.A GENERAL RESTRICTIONS

In the event that the Permittee treats, stores, or disposes of hazardous wastes onsite where such wastes were generated, then the Permittee must comply with MHWMR §264.73(b)(9), and Section 3005(h) of RCRA (42 U.S.C. 6925(h)), and the Permittee must certify, no less often-than annually, that:

IV.A.1 VII.A.I The Permittee has a program in place to reduce the volume and toxicity of hazardous waste generated to the degree determined by the Permittee to be economically practicable; and

IV.A.2 The proposed method of treatment, storage or disposal is the most practicable method available to the Permittee which minimizes the present and future threat to human health and the environment.

VII.B RECORDING REQUIREMENTS

If Condition III.A. is applicable, then the Permittee shall maintain copies of this certification in the facility operating record as required by MHWMR §264.73(b)(9).

VII.C WASTE MINIMIZATION OBJECTIVES

If Condition III.A. is applicable, then the Waste Minimization program required under Condition III.A. should address the objectives listed in Attachment VI-6.

MODULE VIII -LAND DISPOSAL RESTRICTIONS

VIII.A. GENERAL RESTRICTIONS

VIII.A.1 MHWMR Part 268 identifies hazardous wastes that are restricted from land disposal and defines those limited circumstances under which an otherwise prohibited waste may continue to be placed on or in a land treatment, storage or disposal unit. The Permittee shall maintain compliance with the requirements of MHWMR Part 268. Where the Permittee has applied for an extension, waiver or variance under MHWMR Part 268, the Permittee shall comply with all restrictions on land disposal under this Part once the effective date for the waste has been reached pending final approval of such application.

VIII.B. LAND DISPOSAL PROHIBITIONS AND TREATMENT STANDARDS

VIII.B.1 A restricted waste identified in MHWMR Part 268 Subpart C may not be placed in a land disposal unit without further treatment unless the requirements of MHWMR Part 268 Subparts C and/or D are met.

VIII.B.2 The storage of hazardous wastes restricted fromland disposal under MHWMR Part 268 is prohibited unless the requirements of MHWMR Part 268 Subpart E are met.

Permit Attachments

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Form Approved. OMB No. 2050-0034 Expires 1
GSA No. 0248-E

For EPA Regional Use Only

Date Received
Month Day Year

EPA
United States Environmental Protection Agency
Washington, DC 20460

Hazardous Waste Permit Application Part A

(Read the Instructions before starting)

I. Installation's EPA ID Number *(Mark 'X' in the appropriate box)*

[ ] A. First Part A Submission

[X] B. Part A Amendment #

C. Installation's EPA ID Number	D. Secondary ID Number *(If applicable)*
MSD081387730	

II. Name of Facility

Kerrr-McGee Chemical LLC

III. Facility Location *(Physical address not P.O. Box or Route Number)*

A. Street: Highway 11 South

Street *(Continued)*:

City or Town	State	Zip Code
Meridian	MS	39301-

County Code *(if known)*	County Name
	Lauderdale

B. Land Type (Enter code)	C. Geographic Location LATITUDE *(Degrees, minutes, & seconds)*	LONGITUDE *(Degrees, minutes & seconds)*	D. Facility Existence Date Month Day Year
P?	32 20 015	88 44 000	05 22 1998

IV. Facility Mailing Address

Street or P.O. Box: HWY 11 South

City or Town	State	Zip Code
Meridian	MS	39301-

V. Facility Contact *(Person to be contacted regarding waste activities at facility)*

Name *(Last)*	*(First)*
Watson	KEITH

Job Title	Phone Number *(Area Code and Number)*
Project Mgr	405-270-3747

VI. Facility Contact Address *(See Instructions)*

A. Contact Address: Location	Mailing	Other	B. Street or P.O. Box
	X		PO Box 25861

City or Town	State	Zip Code
OKLAHOMA CITY	OK	73125-

EPA I.D. Number *(Enter from page 1)*: MSD081387730

Secondary ID Number *(Enter from page 1)*:

VII. Operator Information *(See Instructions)*

Name of Operator: Kerr-McGee Chemical LLC

Street or P.O. Box: HWY 11 South

City or Town: MERIDIAN

State: MS

ZIP Code: 39301-

Phone Number *(Area Code and Number)*: 601-485-5134

B. Operator Type: P

C. Change of Operator Indicator: Yes [ ] No [X]

Date Changed Month Day Year:

VIII. Facility Owner *(See Instructions)*

A. Name of Facility's Legal Owner: Kerr-McGee Chemical LLC

Street or P.O. Box: PO Box 25861

City or Town: Oklahoma City

State: OK

ZIP Code: 73125-

Phone Number *(Area Code and Number)*: 405-270-1313

B. Owner Type: P

C. Change of Owner Indicator: Yes [X] No [ ]

Date Changed Month: 01 Day: 01 Year: 9

IX. SIC Codes *(4-digit, in order of significance)*

Primary	Secondary
2491 (Description) Wood Preserving	(Description)
Secondary	**Secondary**
(Description)	(Description)

X. Other Environmental Permits *(See Instructions)*

A. Permit Type *(Enter code)*	B. Permit Number	C. Description
R	MSD081387730	RCRA Post-Closure permit
E	MSD081387730	HSWA Permit

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EPA I.D. Number *(Enter from page 1)*

M	S	D	0	8	1	3	8	7	7	3	0

Secondary ID Number *(Enter from page 1)*

XI. Nature of Business *(Provide a brief description)*

Former wood treating facility, including former impoundment closed under RCRA.

XII. Process Codes and Design Capacities

A. PROCESS CODE - *Enter the code from the list of process codes below that best describes each process to be used at the facility. Thirteen lines are provided for entering codes. If more lines are needed, attach a separate sheet of paper with the additional information. For "other" processes (i.e., D99, S99, T04 and X99), describe the process (including its design capacity) in the space provided in Item XIII.*

B. PROCESS DESIGN CAPACITY - *For each code entered in column A, enter the capacity of the process.*

1. **AMOUNT** - *Enter the amount. In a case where design capacity is not applicable (such as in a closure/post-closure or enforcement action) enter the total amount of waste for that process.*
2. **UNIT OF MEASURE** - *For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the unit of measure used. Only the units of measure that are listed below should be used.*

C. PROCESS TOTAL NUMBER OF UNITS - *Enter the total number of units used with the corresponding process code.*

PROCESS CODE	PROCESS	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
	Disposal:	
D79	Underground Injection	Gallons; Liters; Gallons Per Day; or Liters Per Day
D80	Landfill	Acre-feet or Hectare-meter
D81	Land Treatment	Acres or Hectares
D82	Ocean Disposal	Gallons Per Day or Liters Per Day
D83	Surface Impoundment	Gallons or Liters
D99	Other Storage	Any Unit of Measure Listed Below
	Storage:	
S01	Container (Barrel, Drum, Etc.)	Gallons or Liters
S02	Tank	Gallons or Liters
S03	Waste Pile	Cubic Yards or Cubic Meters
S04	Surface Impoundment	Gallons or Liters
S05	Drip Pad	Gallons or Liters
S06	Containment Building	Cubic Yards or Cubic Meters
S99	Other Disposal	Any Unit of Measure Listed Below
	Treatment:	
T01	Tank	Gallons Per Day or Liters Per Day
T02	Surface Impoundment	Gallons Per Day or Liters Per Day
T03	Incinerator	Short Tons Per Hour; Metric Tons Per Hour; Gallons Per Hour; Liters Per Hour; or Btu's Per Hour
T04	Other Treatment	Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; or Btu's Per Hour
T80	Boiler	Gallons or Liters
T81	Cement Kiln	Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; or Btu's Per Hour
T82	Lime Kiln	
T83	Aggregate Kiln	
T84	Phosphate Kiln	
T85	Coke Oven	
T86	Blast Furnace	
T87	Smelting, Melting, Or Refining Furnace	Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; or Btu's Per Hour
T88	Titanium Dioxide Chloride Process Oxidation Reactor	
T89	Methane Reforming Furnace	
T90	Pulping Liquor Recovery Furnace	
T91	Combustion Device Used In The Recovery Of Sulfur Values From Spent Sulfuric Acid	
T92	Halogen Acid Furnaces	
T93	Other Industrial Furnaces Listed in 40 CFR §260.10	
T94	Containment Building	Cubic Yards or Cubic Meters
	Miscellaneous (Subpart X):	
X01	Open Burning/Open Detonation	Any Unit of Measure Listed Below
X02	Mechanical Processing	Short Tons Per Hour; Metric Tons Per Hour; Short Tons Per Day; Metric Tons Per Day; Pounds Per Hour; or Kilograms Per Hour
X03	Thermal Unit	Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; or Btu's Per Hour
X04	Geologic Repository	Cubic Yards or Cubic Meters
X99	Other Subpart X	Any Unit of Measure Listed Below

UNIT OF MEASURE	UNIT OF MEASURE CODE
Gallons	G
Gallons Per Hour	E
Gallons Per Day	U
Liters	L
Liters Per Hour	H
Liters Per Day	V

UNIT OF MEASURE	UNIT OF MEASURE CODE
Short Tons Per Hour	D
Metric Tons Per Hour	W
Short Tons Per Day	N
Metric Tons Per Day	S
Pounds Per Hour	J
Kilograms Per Hour	R

UNIT OF MEASURE	UNIT OF MEASURE CODE
Cubic Yards	Y
Cubic Meters	C
Acres	B
Acre-feet	A
Hectares	Q
Hectare-meter	F
Btu's Per Hour	I

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EPA I.D. Number *(Enter from page 1)*

M	S	D	0	8	1	3	8	7	7	3	0

Secondary ID Number *(Enter from page 1)*

XII. Process Codes and Design Capabilities *(Continued)*

EXAMPLE FOR COMPLETING ITEM XII (shown in line number X-1 below): A facility has a storage tank, which can hold 533.788 gallons.

Line Number		A. Process Code (From list above)			B. PROCESS DESIGN CAPACITY 1. Amount (Specify)	B. 2. Unit Of Measure (Enter code)	C. Process Total Number Of Units	For Official Use Only
X	1	S	0	2	5 3 3 . 7 8 8	G	0 0 1	
	1	D	8	3	Closed Impoundment 2,416,519	G	1	
	2							
	3							
	4							
	5							
	6							
	7							
	8							
	9							
1	0							
1	1							
1	2							
1	3							

NOTE: If you need to list more than 13 process codes, attach an additional sheet(s) with the information in the same format as above. Number the lines sequentially, taking into account any lines that will be used for "other" processes (i.e., D99, S99, T04 and X99) in item XIII.

XIII. Other Processes *(Follow instructions from item XII for D99, S99, T04 and X99 process codes)*

Line Number (Enter #s in seq w/XII)		A. Process Code (From list above)			B. PROCESS DESIGN CAPACITY 1. Amount (Specify)	B. 2. Unit Of Measure (Enter code)	C. Process Total Number Of Units	D. Description Of Process
X	1	T	0	4				In-situ Vitrification
	1							
	2							
	3							
	4							

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EPA I.D. Number *(Enter from page 1)*

M	S	D	0	8	1	3	8	7	7	3	0

Secondary ID Number *(Enter fro*

XIV. Description of Hazardous Wastes

A. EPA HAZARDOUS WASTE NUMBER - *Enter the four-digit number from 40 CFR, Part 261 Subpart D of each list waste you will handle. For hazardous wastes which are not listed in 40 CFR, Part 261 Subpart D, enter the four-di from 40 CFR, Part 261 Subpart C that describes the characteristics and/or the toxic contaminants of those hazar*

B. ESTIMATED ANNUAL QUANTITY - *For each listed waste entered in column A estimate the quantity of that was handled on an annual basis. For each characteristic or toxic contaminant entered in column A estimate the total an of all the non-listed waste(s) that will be handled which possess that characteristic or contaminant.*

C UNIT OF MEASURE - *For each quantity entered in column B enter the unit of measure code. Units of measure w used and the appropriate codes are:*

ENGLISH UNIT OF MEASURE	CODE	METRIC UNIT OF MEASURE	C
POUNDS	P	KILOGRAMS	
TONS	T	METRIC TONS	

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of units of measure taking into account the appropriate density or specific gravity of the waste.

D. PROCESSES

1. PROCESS CODES:

For listed hazardous waste: For each listed hazardous waste entered in column A select the code(s) from the list of pr contained in item XII A. on page 3 to indicate how the waste will be stored, treated, and/or disposed of at the facility.

For non-listed hazardous waste: For each characteristic or toxic contaminant entered in column A, select the code(s) of process codes contained in item XII A. on page 3 to indicate all the processes that will be used to store, treat, and/ o all the non-listed hazardous wastes that possess that characteristic or toxic contaminant.

NOTE: THREE SPACES ARE PROVIDED FOR ENTERING PROCESS CODES. IF MORE ARE NEEDED:

1. *Enter the first two as described above.*
2. *Enter "000" in the extreme right box of item XIV-D(1).*
3. *Enter in the space provided on page 7, item XIV-E, the line number and the additional code(s).*

2. PROCESS DESCRIPTION: *If a code is not listed for a process that will be used, describe the process in the spac on the form (D.(2)).*

NOTE: HAZARDOUS WASTES DESCRIBED BY MORE THAN ONE EPA HAZARDOUS WASTE NUMBER - H wastes that can be described by more than one EPA Hazardous Waste Number shall be described on the form

1. *Select one of the EPA Hazardous Waste Numbers and enter it in column A. On the same line complete c B, C and D by estimating the total annual quantity of the waste and describing all the processes to be us store, and/or dispose of the waste.*
2. *In column A of the next line enter the other EPA Hazardous Waste Number that can be used to describe t In column D(2) on that line enter "Included with above" and make no other entries on that line.*
3. *Repeat step 2 for each EPA Hazardous Waste Number that can be used to describe the hazardous waste.*

EXAMPLE FOR COMPLETING ITEM XIV (shown in line numbers X-1, X-2, X-3, and X-4 below) - A facility will treat an of an estimated 900 pounds per year of chrome shavings from leather tanning and finishing operation. In addition, the f treat and dispose of three non-listed wastes. Two wastes are corrosive only and there will be an estimated 200 pounds p each waste. The other waste is corrosive and ignitable and there will be an estimated 100 pounds per year of that waste. will be in an incinerator and disposal will be in a landfill.

Line Number	A. EPA HAZARD WASTE NO. (Enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (Enter code)	D. PROCESS (1) PROCESS CODES (Enter)	(2) PROCESS DESC (If a code is not enter
X 1	K 0 5 4	900	P	T 0 3 D 8 0	
X 2	D 0 0 2	400	P	T 0 3 D 8 0	
X 3	D 0 0 1	100	P	T 0 3 D 8 0	
X 4	D 0 0 2				Included With Above

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EPA I.D. Number *(Enter from page 1)*: M S D 0 8 1 3 8 7 7 3 0

Secondary ID Number *(Enter from page 1)*:

XIV. Description of Hazardous Wastes *(Continued)*

Line Number	A. EPA Hazardous Waste No. (Enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (Enter code)	D. PROCESSES (1) PROCESS CODES (Enter code)	D. PROCESSES (2) PROCESS DESCRIPTIO (If a code is not entered in D)
1	K 0 0 1	0	T	0 0 0 D 8 3	Closed surface impour
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					

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GSA No. 0248-

EPA I.D. Number *(Enter from page 1)*	Secondary ID Number *(Enter from page 1)*
M S D 0 8 1 3 8 7 7 3 0	

XV. Map

Attach to this application a topographic map, or other equivalent map, of the area extending to at least one mile beyond property boundar The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers an other surface water bodies in this map area. See instructions for precise requirements.

XVI. Facility Drawing

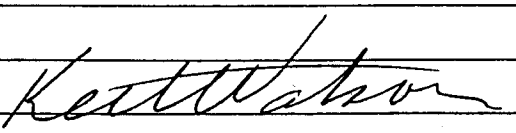
All existing facilities must include a scale drawing of the facility (See instructions for more detail).

XVII. Photographs

All existing facilities must include photographs (aerial or ground-level) that clearly delineate all existing structures; existing storage, treatn and disposal areas; and sites of future storage, treatment or disposal areas (see instructions for more detail).

XVIII. Certification(s)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision i accordance with a system designed to assure that qualified personnel properly gather and evaluate the informatio submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsibl for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, an complete. I am aware that there are significant penalties for submitting false information, including the possibility of fin and imprisonment for knowing violations.

Owner Signature 	Date Signed Jan. 15, 19
Name and Official Title (Type or print) George D. Christiansen, Vice President	
Owner Signature	Date Signed
Name and Official Title (Type or print)	
Operator Signature 	Date Signed Jan. 15, 1
Name and Official Title (Type or print) A. Keith Watson, Project Manager	
Operator Signature	Date Signed
Name and Official Title (Type or print)	

XIX. Comments

Regarding Item VII.C., change of owner, on January 1, 1998, Kerr-McGee Chemical Corporation was merged into a new company, Kerr-McGee Chemical LLC (KMC LLC). KMC LLC now owns the Meridian property and will be the permittee.

Note: Mail completed form to the appropriate EPA Regional or State Office. (Refer to instructions for more information)

SECTION 4

POST-CLOSURE CARE PLAN

This section describes the post-closure care plan KMCC-FPD will follow for at least 30 years, unless approval is received from the MBPC and the EPA to discontinue the program. The plan is organized into eight areas: floodplain standards, inspection and maintenance, security, training, recordkeeping, groundwater monitoring, financial assurance, and deed documentation.

The post-closure care plan is implemented by the site hazardous waste coordinator. Table 4-1 presents a summary of the responsibilities of this position. The KMCC-FPD Hazardous Waste Program Coordinator will provide assistance to the plant whenever necessary. The Hazardous Waste Program Coordinator is a division staff position responsible for the development of hazardous waste programs at this KMC LLC site. One copy of the post-closure plan will be kept at the site, and one at the division headquarters office. The addresses of these locations are given in EPA Form 8700-23.

FLOODPLAIN STANDARDS

Inspection of the Flood Insurance Rate Map for the Meridian, Mississippi area reveals that the KMCC-FPD wood treating plant is within the 100-year floodplain. The top of the closed impoundment is at elevation 300.5 ft. MSL, and the floodplain itself is at elevation 301.5 ft. MSL. KMCC-FPD requests a waiver from the floodplain standard because we feel strongly that: a) there is an extremely small chance that washout will occur even in the event of a 100-year flood; and b) there would be no adverse effects on human health or environment should the washout occur. These assertions are supported by the evidence in the following paragraphs.

All reusable oil in the dewatered impoundment was reclaimed for process use. This recycling left only contaminated soil at the bottom of the impoundment. Contaminated soil was excavated to 6 inches below the visibly clean horizon, and solidified with kiln dust for

FACILITY HAZARDOUS WASTE COORDINATOR

SITE HAZARDOUS WASTE COORDINATOR

Principal hazardous waste coordinator, responsible for all plant operations with the authority to commit the resources needed to carryout the post-closure care plan, including inspection and maintenance, security, record keeping, and reporting.

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disposal. 2,964 cubic yards were excavated from the sides and borrow of the impoundment, and 6,283 cubic yards of backfill, which consisted of the existing earthen berm and imported clay borrow, were compacted into place. The borrow was a sandy/silty clay-type material and was compacted in six-inch lifts to a minimum density of 95%, at optimum moisture content.

Select borrow material, the same used for backfill, was used for formation of the 12-inch thick impermeable clay cap, which was constructed - a grade of 2.25%. The select borrow was a cohesive CH-type material with a plasticity index of 39, and was compacted in 6-inch lifts to a minimum density of 95%, at optimum moisture content. The clay used for the cap was tested by J. W. Kemp & Associates, Ltd., of Meridian, Mississippi, for several critical parameters, including permeability. The soil sample tested was found to be impermeable after one month under the applied test conditions, which included an induced head of 9 feet.

After the select clay cap was put in place and compacted to the satisfaction of the professional engineer and owner, approximately 8,922 square yards of four-inch thick top soil was applied to the entire surface area of the impoundment. To prevent soil erosion, the top soil was fertilized, seeded and mulched in accordance with Mississippi Standard Specifications for State Aid, Road and Bridge Construction, S-214-03, Mixture Number 3; and S-215.

4-6 feet of backfill and the 12-inch thick clay cap form an effective barrier between floodwaters and contaminated soil, which is 2-3 feet below grade. For the contamination to be exposed to water, not only would the backfill and cap have to be washed out, the soil surrounding the closed impoundment would have to be washed away as well. If however, the backfill, cover, and surrounding soil washed out, the small amount of contamination left in place after closure would be diluted by the enormous volume of water present in the area during a 100-year flood, and would not pose a threat to human health or the environment.

NSPECTION AND MAINTENANCE

ence, but

l across

he area containing the closed impoundment will be inspected for the following items:

nit a

- Erosion damage. The impoundment cap and cover are designed to minimize erosion. They will be inspected for growth of ground cover, sloughing, growth of nuisance plants (plants with root systems capable of penetrating the cap), and any other signs of disturbance. Grass will be mowed, fertilized, and re-seeded as needed; sloughing will be remedied as soon as it is discovered; and nuisance plant growth controlled by manual removal.

- Security devices. The fence surrounding the impoundment, and any locks on the fence, will be inspected for breaks or signs of damage. All warning signs will be checked for legibility and evidence of damage.

- Run-on/run-off control system. The dome-shaped cap of the impoundment is designed to act as run-on/run-off control. Pooling of water in any part of the impoundment cap will be used to indicate failure of this system, and will be remediated immediately.

- Groundwater monitoring system. All monitoring wells will be inspected for the presence of a locked cap, integrity of the above-ground well casing, and the condition of the concrete collar at the base of the well casing.

emedial action will be implemented within five days of any inspection which reveals areas quiring attention. The results of each inspection, and any related remedial maintenance will be corded on the form presented in Figure 4-1. Table 4-2 indicates the frequency of inspections.

addition to these routine inspections, an annual engineering site survey will be performed by

POST-CLOSURE CARE INSPECTION REPORT
KERR-MCGEE CHEMICAL CORPORATION
FOREST PRODUCTS DIVISION
MERIDIAN, MISSISSIPPI

INSPECTION ITEM	CONDITION (/) GOOD	CONDITION (/) NEEDS ATTENTION (Describe)	MAINTENANCE PERFORMED
IMPOUNDMENT CAP AND COVER GROWTH OF GROUND COVER GROWTH OF NUISANCE PLANTS PRESENCE OF STANDING WATER			
SECURITY DEVICES FENCE LOCKS WARNING SIGNS			
GROUNDWATER MONITORING WELLS CAP CASING CONCRETE COLLAR			

REMARKS _____

_____

_____

_____ _____

SIGNATURE DATE

SECURITY

The closure procedures were conducted such that they effectively isolated the facility workers and surrounding community from exposure to any potentially hazardous situation created by the closed facility. In addition, KMC LLC will maintain a locked fence around the closed impoundment to limit the possibility of unauthorized people entering the area. Warning signs which advise people of potential dangers in the closure area will be placed on the fence.

TRAINING

As part of the KMC LLC safety program, all personnel exposed to potentially hazardous situations are trained annually in how to minimize the risk of those situations to human health. The program includes a separate training session for the on-site hazardous waste coordinator. An outline of the hazardous waste training program is given in Table 4-3. The training program will be conducted by qualified personnel from Kerr-McGee Corporation, Safety and Environmental Affairs Division. A record of the attendees and their performance during the training session will be maintained on-site.

RECORDKEEPING

All records associated with the post-closure care program will be maintained at the plant site. These records will be available to MBPC and EPA officials upon their request and verification of their identification. The retention period for all records is given in Table 4-4. The site hazardous waste coordinator will be responsible for recordkeeping.

TABLE 4-3

HAZARDOUS WASTE TRAINING OUTLINE

I) Regulations Review

A) Purpose of RCRA

B) Basic Operating Standards Applicable to Post Closure

C) Recent Modifications Applicable to Post Closure

II) Reporting Procedures

A) Spill/Emergency Response

B) Annual Waste Generator Report

C) Annual Groundwater Report

D) Manifest Preparation

E) Annual Engineering Survey

III) Record Keeping

IV) Post-Closure Care Plan

A) Inspection and Maintenance

B) Security

C) Record Keeping

D) Groundwater Monitoring

V) Emergency Response Program

VI) Site Health and Safety Plan

GROUNDWATER MONITORING PLAN

KMCC-FPD initially installed groundwater monitoring wells at the Meridian Facility in January, 1981. This monitoring system represented a first level detection system for the facility's surface impoundment, and fulfilled groundwater monitoring requirements of the Resource Conservation and Recovery Act (RCRA) which were made explicit in Subpart F of 40 CFR 265.

Several monitoring wells have been added since 1981, and the groundwater monitoring system is now represented by wells located throughout the facility (Figure 4-2). The MW-series monitor wells (Nos. 1 through 7) were established primarily to obtain water quality data for the shallow alluvial aquifer underlying the facility. These wells were replaced with stainless steel wells in the 1990s. The P-series piezometers (Nos. I through 16) were installed to determine the configuration of the potentiometric surface of the alluvial aquifer. The piezometers are occasionally sampled for water quality. Lithologic logs and monitor well construction diagrams for all monitor wells and piezometers are included in Appendix I.

In October, 1984 KMCC-FPD submitted a Groundwater Quality Assessment Plan (GWQAP) to the Mississippi Bureau of Pollution Control (MBPC) in response to a statistically significant difference from background levels of TOC and/or pH in downgradient monitor wells MW-3 and MW-4. The statistical difference was found upon evaluation of second year, first semi-annual sampling data for 1984. The GWQAP, which included drilling and sampling of monitor wells, was conducted in two phases and culminated in a final report issued to the MBPC in June, 1985. Results of the GWQAP indicated the surface impoundment had not impacted the groundwater. Further discussion of the groundwater assessment program at the facility can be found in the "Site Groundwater Monitoring" portion of Section 5, "Site Hydrogeology".

TABLE 4-4

RETENTION PERIOD FOR POST-CLOSURE CARE RECORDS

Item	Retention Period
Inspection Records	3 years
General Maintenance Records	5 years
Training Records	Indefinitely (until employee termination)
Groundwater Monitoring Records	30 years
Remedial Maintenance Records	10 years

The post-closure groundwater monitoring plan is designed to measure how effectively the impoundment closure arrests the migration of K001 waste constitutents. The plan may require modifications based upon analytical results or regulatory changes.

The plan will use wells which are part of the existing monitoring network at the facility. Well MW-1B is the upgradient well, and wells MW-2A, MW-3A, and MW-4A are the downgradient wells. They were completed in the shallow alluvial deposits which consitute the uppermost aquifer, the most vulnerable to contamination.

The wells are constructed of stainless steel, which was acceptable to the MBPC at the time of installation. KMC LLC is aware that EPA groundwater monitoring technical guidelines specify use of either stainless steel or teflon for well construction. KMCC replaced the original PVC wells with ones of stainless steel.

KMC LLC will sample all wells quarterly for pH, specific conductivity, and the base/neutral fractions of the Appendix VII K00I constituents. The post-closure groundwater sampling and analytical schedule is given in Table 4-5. Sampling and analysis procedures are described in Appendix J.

To determine statistically significant variations in any monitored parameter, KMC LLC will use the most recent two years of groundwater data from the upgradient well to calculate the background mean and variance. These parameters will then be compared to the downgradient well data utilizing the Cochran's Approximation to the Behrens-Fisher Student's T-Test, described in Appendix IV of 40 CFR 264. Because of the inherent probability of obtaining spurious data from groundwater monitoring, KMC LLC will also stipulate that the total K001 constituents in any well must be greater than 150 ppb for one sampling event for that well to be declared contaminated.

If KMC LLC determines, using the criteria described above, that there has been a statistically significant increase in any monitored parameter, KMC LLC will notify the Regional Administrator in writing within 7 days after the discovery of contamination. KMC LLC will also initiate additional sampling to confirm contamination concentrations, submit an application for permit modification to establish a compliance monitoring program, and develop an engineering plan for corrective action, according to the requirements in 40 CFR 264.98(h).

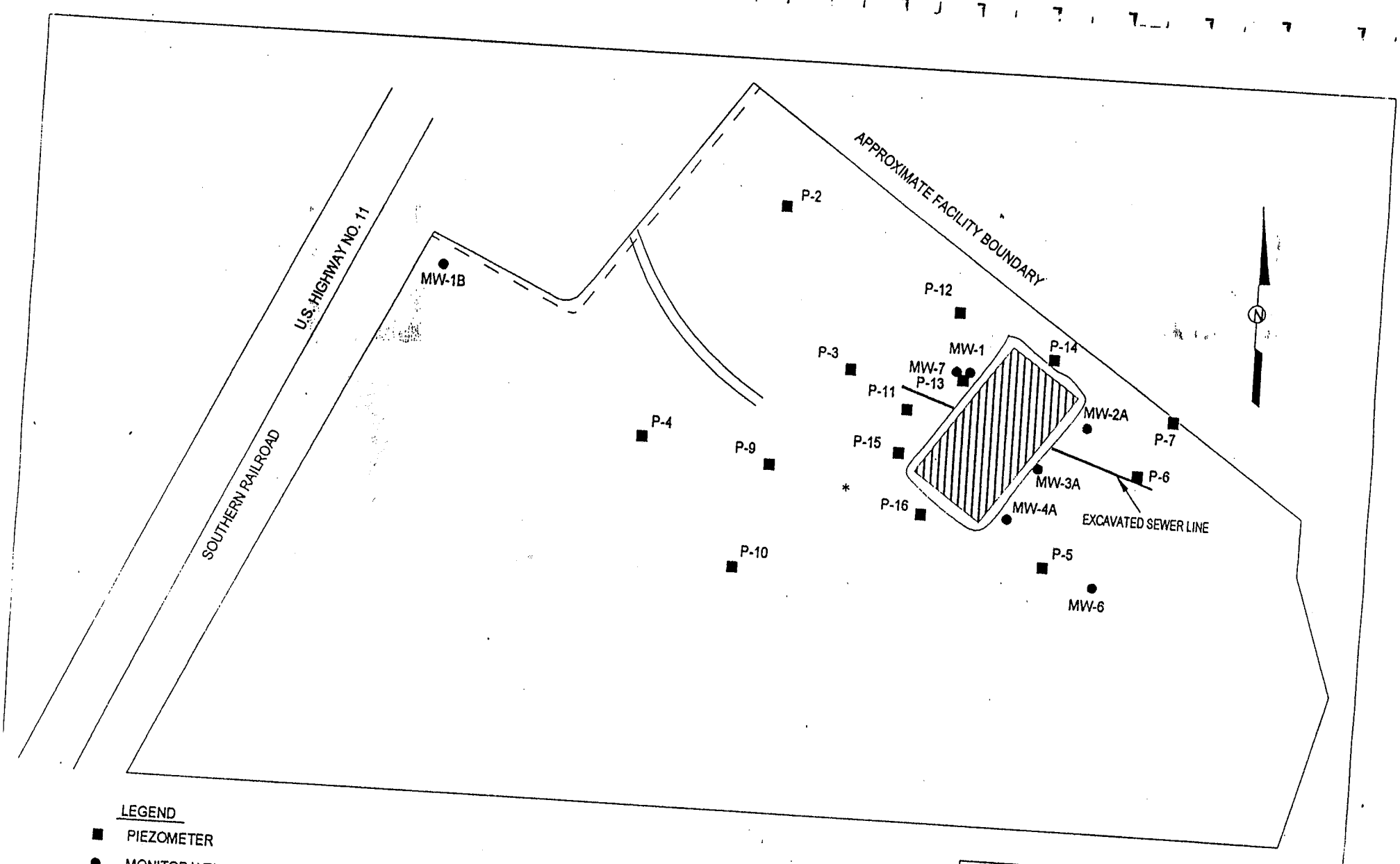


FIGURE 4-2
FACILITY MAP (SINCE 1990)

KERR-McGEE CORP.-SAFETY & ENVIRONMENTAL AFFAIRS DIV.

MERIDIAN FACILITY
KERR-McGEE CHEMICAL FACILITY

TABLE 4-5

POST CLOSURE GROUNDWATER MONITORING SCHEDULE

KERR-MCGEE CHEMICAL CORPORATION, FOREST PRODUCTS DIVISION

FOR WELLS MW-IB, MW-2A, MW-3A, MW-4A	SAMPLING PERIOD			
	First Quarter	Second Quarter	Third Quarter	Four Quar
pH (in replicates)	x	x	x	x
Specific Conductivity (in replicates)	x	x	x	x
Chrysene	x	x	x	x
Napthalene	x	x	x	x
Fluoranthene	x	x	x	x
Benzo(b)fluoranthene	x	x	x	x
Benzo(a)pyrene	x	x	x	x
Ideno(l, 2, 3-d)pyrene	x	x	x	x
Benz(a)anthrancene	x	x	x	x
Dibenz(a)anthracene	x	x	x	x
Acenaphthylene	x	x	x	x

FINANCIAL ASSURANCE

KMC-LLC has projected the annual cost of the post-closure care program to be $22,860. A breakdown of the total cost estimate is given in Table 4-6.
Financial documents which provide for 30 years of post-closure care are given in Appendix K.

DEED DOCUMENTATION

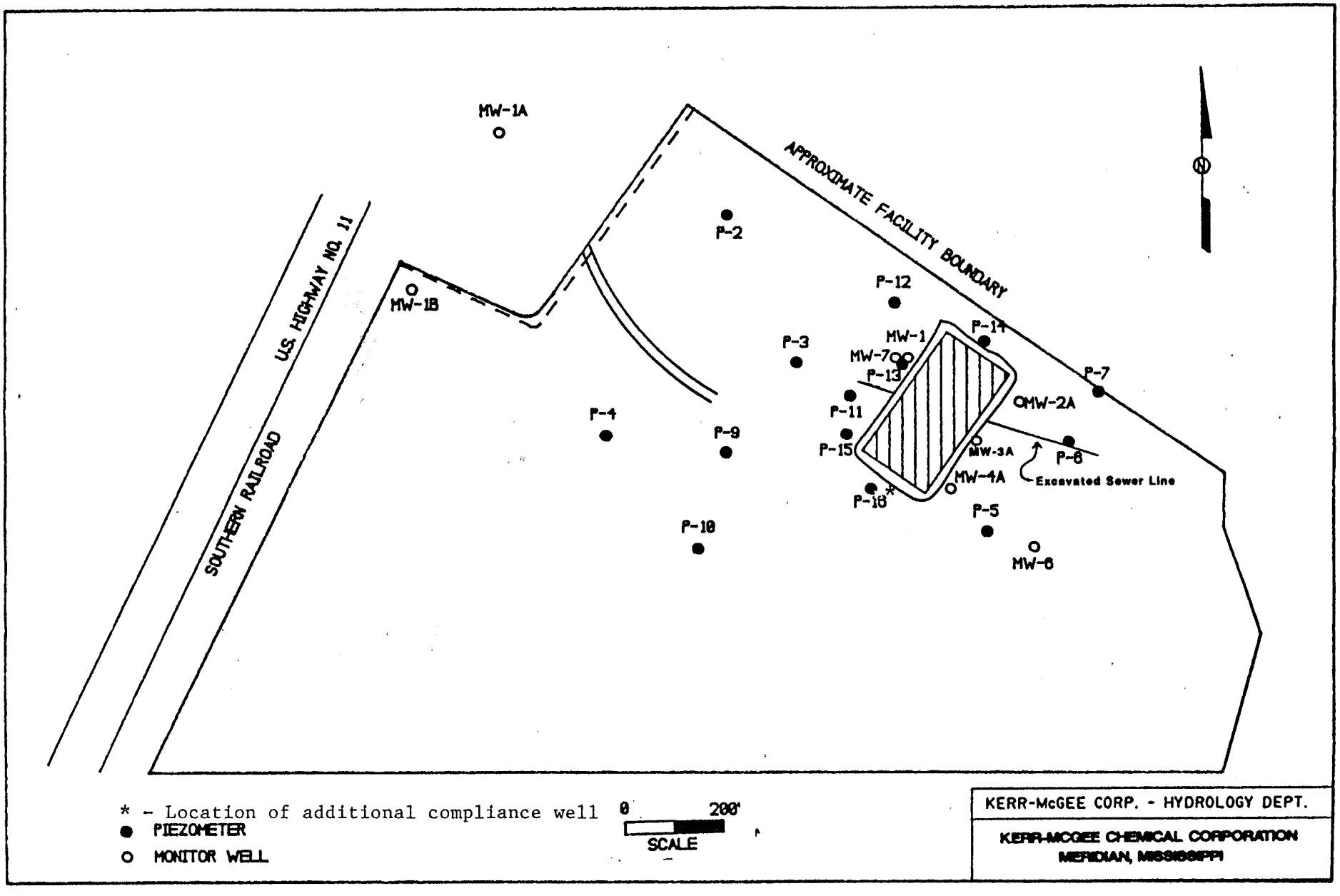
KMC LLC will attach a document to the facility's deed which legally describes the location of the closed hazardous waste impoundment. A copy of this document can be found in Appendix L.

TABLE 4-6

POST-CLOSURE CARE COST ESTIMATE

Item	Annual Cost
INSPECTION	
a) Weekly Inspection: 1*our/week, 52 hour/year, $10/hour	$520.00
b) Annual Engineering Survey:	$1,500.00
MAINTENANCE	
a) Routine Maintenance including fence, sign, weed control, monitoring wells: 2 hours/week, 104 hours/year, $10/hour	$1,040.00
b) Emergency:	$1,000.00
GROUNDWATER MONITORING	
a) Quarterly sampling for indicator parameters (quad), K001 constituents: 5 wells, $750/well, 4 X/year	$ 15,000.00
b) Annual sampling for groundwater quality parameters: 5 wells. $100 per year, 1 X/year	$500.00
ADMINISTRATION	
a) Record Keeping: 1 hour/week, 52 hours/year, $25/hour	$1,300.00
b) Annual Report: 40 hours, $50/hour	$2,000.00
Total Annual Cost	$ 22,860.00
30 year Cost Estimate	$685,800.00
20 year Estimate*	$467,650

* Includes inflation since 1988.


MW-1A
APPROXIMATE FACILITY BOUNDARY
U.S. HIGHWAY NO. 11
SOUTHERN RAILROAD
MW-1B
P-2
P-12
P-14
P-3
MW-1
MW-7
P-13
P-7
P-11
OMW-2A
P-4
P-9
P-15
MW-3A
P-8
MW-4A
Excavated Sewer Line
P-18*
P-5
P-10
MW-6
N
* - Location of additional compliance well
PIEZOMETER
MONITOR WELL
0
200'
SCALE
KERR-McGEE CORP. - HYDROLOGY DEPT.
KERR-MCGEE CHEMICAL CORPORATION
MERIDIAN, MISSISSIPPI

SAMPLING AND ANALYSIS PLAN
KERR-McGEE CHEMICAL LLC
MERIDIAN, MISSISSIPPI

Prepared By:

Roy K. Widmann
Hydrology Department
Kerr-McGee Corporation

February 14, 1991

Revised
March 1, 1992
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August 30, 1996
May 29, 1998

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SAMPLING AND ANALYSIS PLAN
KERR-McGEE CHEMICAL LLC
MERIDIAN, MISSISSIPPI

INTRODUCTION

Kerr-McGee Chemical LLC (KMC-LLC) has prepared this Sampling and Analysis Plan for the closed wood preserving facility in Meridian, Mississippi. The Sampling and Analysis Plan describes in detail collection protocols for groundwater samples, surface water samples, and surface and sub-surface soil samples. Also included are details on field and laboratory quality assurance/quality control programs, laboratory analyses and monitor well installation and abandonment procedures.

This document is to be used by all facility personnel and consultants responsible for obtaining types of samples described above or who are responsible for monitor well installation or abandonment. A copy of this plan will be kept on file at the facility for the appropriate personnel to review and reference.

GROUNDWATER SAMPLING PROTOCOL

Groundwater sampling from wells is required to define and document any potential impacts to native groundwater quality resulting from facility operations. In order to ensure that the analytical data developed for the groundwater is accurate, the sampling personnel must be certain that the sample is representative of the groundwater system that exists around the monitoring well.

SAMPLING TEAM MEMBERS

It is the responsibility of Kerr-McGee Corporation's Hydrologic Field Assistants to collect all routine (quarterly) groundwater monitor well samples at the facility. At least one of them is present during sample collection, although the facility may supply an assistant to help purge monitor wells and to assist in the sampling.

Contract personnel (consultants) may be used to obtain groundwater samples for non-routine events (ie, Confirmatory Sampling, RI/FS activities, etc). A copy of this Sampling and Analysis Plan will be made available for their review prior to them sampling. All groundwater sampling will be done according to this Plan.

STEPS TAKEN PRIOR TO SAMPLE WITHDRAWAL

Initial Observations

Field personnel who sample the KMC-LLC groundwater monitor wells make note of the general well and site conditions upon arrival on an appropriate field parameter form (Table 1). An inspection of all monitor wells is made to insure their surface and sub-surface integrities. For example, general comments about the weather conditions for each sampling date are recorded. Specific comments on each of the wells are then made, with typical notations to include, but not be limited to, whether a well is in a flooded area, ground subsidence, the presence of nearby desiccation cracks, etc. A notation concerning missing well locks or caps is made if appropriate. Observations related to the physical condition of the well are recorded if it appears the well has been damaged (for example, from vandalism, being struck by a vehicle, etc.). It is the responsibility of the Hydrologic Field Assistant or contract sampling personnel to make minor

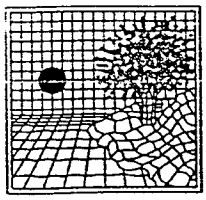


TABLE 1

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
1700 W. Albany • Broken Arrow, Oklahoma, 74012 • Office: 918-251-2858 • Fax 918-251-2599

FIELD PARAMETER FORM

Site: _____ Sample Point: _____ Quarter: _____

FIELD PROCEDURES

PURGE DATE (YY-MM-DD)	START PURGE (2400 Hr. Clock)	ELAPSED HRS.	WATER VOL. IN CASING (Gallons)	VOLUME PURGED (Gallons)

Sampling Method: _____

Sampler Type: ☐ A-Submersible Pump B-ISCO C-Bladder Pump D-Dipper/Bottle E-Bailer F-Scoop/Shovel X-Other _____ (Specify Other)

Sampler Material: ☐ A-Teflon B-Metal C-PVC D-Plastic X-Other _____ (Specify Other)

Tubing Material ☐ A-Teflon B-Tygon C-Polyethylene D-Silicon X-Other _____ (Specify Other)

Sample Composited: ☐ Y-Yes N-No _____ Procedure/Proportions

FIELD MEASUREMENTS

Well Elevation (ft/msl): _____ Well Depth (ft): _____

Depth to Ground water (ft): _____ Sample Depth (non-well) (ft): _____

Groundwater Elevation (ft/msl): _____

1st	ph (STD)	1st	spec. cond.	um/cm at 25°C	(other parameter)	value		
2nd	ph (STD)	2nd	spec. cond.	um/cm at 25°C	(other parameter)	value		
3rd	ph (STD)	3rd	spec. cond.	um/cm at 25°C	(other parameter)	value		
4th	ph (STD)	4th	spec. cond.	um/cm at 25°C	(other parameter)	value		
	Sample Temp. °C		Turbidity NTU					

FIELD COMMENTS

Sample Appearance: _____

Weather Conditions: _____

Other: _____

FILTERING: Use Chain of Custody to indicate which bottles were filtered.

Sampler: _____ (Please Print) Employer: _____

I certify that sampling procedures were in accordance with applicable EPA state and corporate protocols. _____ (Date) _____ (Signature)

repairs immediately. Written maintenance requests for more extensive repairs must be made to the facility care-taker and to the project manager.

Measurement of Static Water Level and Well Depth

After all general and pertinent observations are recorded, the Hydrologic Field Assistant or contract sampling personnel measures a static water level in all groundwater monitor wells which are part of the groundwater monitoring system. The well cap is removed and placed upside down on the ground or placed in the field vehicle. An electric water level indicator is tested to make sure it is operable. The probe is lowered downhole until the fluid level is detected. The depth to fluid is then recorded (field parameter form) to the nearest 0.01 foot with respect to the reference point (either a mark or a notch) at the top of the casing. All reference points have been measured in relation to mean sea level by a licensed surveyor.

For wells which have historically shown no evidence of visible or dissolved creosote, the measurement probe is cleaned in a detergent rinse solution (such as Alconox), followed by a rinse in distilled/deionized water and then a towel wipe. For wells which contain dissolved or visible product, depth-to-water measurements are made with dedicated water level indicators or disposable devices.

Total depth for those wells with no free product is then measured with respect to the top of the casing for each well using a weighted steel tape or water level indicator. The same criteria for instrument use and decontamination, as described above for water level measurement, applies to the measurement of total well depth. Again, the measurement is recorded (field parameter form)

to the nearest 0.01 foot. The measuring device is removed from the well, rinsed with deioniz water, and dried with a disposable paper towel. Screened monitor wells that are part of the groundwater detection monitoring program or corrective action program that show greater th 3.0 foot difference from original completed depth will be re-developed by surging, jetting or means approved by the MDEQ to remove sediment. For wells containing free product, total depth is measured with either dedicated or disposable devices (i.e. weighted string, etc.).

In general, total well depths are measured at the time wells are installed and semi-annually thereafter.

Measurement of Immiscible Fluids

The presence of floating or settled immiscible liquid in a well is recorded on the field paramet form. Floating liquids (LNAPL'S - light, non-aqueous phase liquids) such as a sheen can sometimes be detected visually by looking down a well. If suspected to be present, a disposal clear polyethylene bailer is lowered to just below the air/fluid interface. The tube is retrieved from the well and a measurement is made and recorded as to the "floater's" thickness using a s tape graduated to 0.01 feet.

Immiscible settled liquids ("sinkers" - or DNAPL's, dense non-aqueous phase liquids) are detected after measuring total well depth by careful inspection of the measuring device. "Sink will tend to "adhere to" or "stain" the device, permitting an accurate measurement of its thickn with a steel tape graduated to 0.01 feet. Detection may also be done with use of an interface probe or with clear, dedicated, double-check sampling tubes.

If free product is found to exist in any of the routinely sampled monitor wells, that particular well is not sampled. Rather, the free product is removed from the well quarterly by bailing or other approved method by the MDEQ until such time that the free product is no longer present. Sampling of that well resumes during the next regularly scheduled sampling event if free product is not detected. Recovered product may be re-cycled for re-use at the Kerr-McGee Chemical LLC wood preserving facility in Columbus, Mississippi facility, or will be properly disposed by a licensed hazardous waste hauler.

WITHDRAWING A WATER SAMPLE

Calculating Volume of Water to be Evacuated

It is standard practice to evacuate a minimum of three casing volumes from each well before obtaining a sample. There are instances, however, where well recovery is extremely slow and three casing volumes cannot be removed. When this occurs, the well is evacuated to near dryness and sampled after sufficient volume of water is available to obtain the necessary volume of water required for analyses. The volume of water purged from each well before obtaining a sample is recorded (field parameter form) by the Hydrologic Field Assistant or contract sampling personnel.

KMC-LLC has prepared a table (Table 2) used by field personnel in determining the amount of fluid to be evacuated from various size monitor wells. Alternatively, field personnel can calculate the volume of fluid to be removed by using the conversion factors of 0.16, 0.37, 0.65, 1.02 and 1.47 gallons per foot of water in well for 2, 3, 4, 5, and 6 inch diameter wells, respectively. For example, given a 2 inch well with 40 feet of standing fluid:

TABLE 2: VOLUME OF WATER TO BE PURGED FROM VARIOUS SIZE MONITOR WELLS

AMOUNT (FEET) OF FLUID IN WELL	# Gals to Evacuate One Casing Volume					# Gals to Evacuate Two Casing Volumes					# Gals to Evacuate Three Casing Volumes				
	2"	3"	4"	5"	6"	2"	3"	4"	5"	6"	2"	3"	4"	5"	6"
1.0	0.16	0.37	0.65	1.02	1.47	0.32	0.74	1.30	2.04	2.94	0.48	1.11	1.95	3.06	4.41
2.0	0.32	0.74	1.30	2.04	2.94	0.64	1.48	2.60	4.08	5.88	0.96	2.22	3.90	6.12	8.82
3.0	0.48	1.11	1.95	3.06	4.41	0.96	2.22	3.90	6.12	8.82	1.44	3.33	5.85	9.18	13.23
4.0	0.64	1.48	2.60	4.08	5.88	1.28	2.96	5.20	8.16	11.76	1.92	4.44	7.80	12.24	17.64
5.0	0.80	1.85	3.25	5.10	7.35	1.60	3.70	6.50	10.20	14.70	2.40	5.55	9.75	15.30	22.05
6.0	0.96	2.22	3.90	6.12	8.82	1.92	4.44	7.80	12.24	17.64	2.88	6.66	11.70	18.36	26.46
7.0	1.12	2.59	4.55	7.14	10.29	2.24	5.18	9.10	14.28	20.58	3.36	7.77	13.65	21.42	30.87
8.0	1.28	2.96	5.20	8.16	11.76	2.56	5.92	10.40	16.32	23.52	3.84	8.88	15.60	24.48	35.28
9.0	1.44	3.33	5.85	9.18	13.23	2.88	6.66	11.70	18.36	26.46	4.32	9.99	17.55	27.54	39.69
10.	1.60	3.70	6.50	10.20	14.70	3.20	7.40	13.00	20.40	29.40	4.80	11.10	19.50	30.60	44.10
15.	2.40	5.55	9.75	15.30	22.05	4.80	11.10	19.50	30.60	44.10	7.20	16.65	29.25	45.90	66.15
20.	3.20	7.40	13.00	20.40	29.40	6.40	14.80	26.00	40.80	58.80	9.60	22.20	39.00	61.20	88.20
25.	4.00	9.25	16.25	25.50	36.75	8.00	18.50	32.50	51.00	73.50	12.00	27.75	48.75	76.50	110
30.	4.80	11.10	19.50	30.60	44.10	9.60	22.20	39.00	61.20	88.20	14.40	33.30	58.50	91.80	132

40 ft. x 0.16 gals/ft = 6.4 gals. per casing volume

- therefore, 19.2 gallons of fluid would need to be evacuated before a sample is taken (3 casing volumes)

Well Evacuation

Well evacuation is performed with the use of dedicated stainless steel bailers and attached Tefl rope for the stainless steel wells, or with PVC bailers and attached polyethylene rope for the PV wells, or by other methods approved by the MDEQ. When not in use, both the bailer and rope stored inside of the well and are protected from contamination.

Just prior to well evacuation, a clean plastic sheet or a 30 gallon trash can lined with clean plast is placed adjacent to the monitor well to keep the bailer and rope from coming in contact with tl ground. This procedure is done to prevent the bailer and rope from possibly being contaminate from touching the ground before, during and after the bailing and sampling process.

When well evacuation is performed with a bailer, the bailer is lowered slowly downhole to prevent de-gassing of the fluid column. The bailer is allowed to fill and is then retrieved from th well. All purged water is saved in a 55 gallon drum placed adjacent to the well. The sampler wi note on the field parameter form observations on the bailed water (i.e., odor, color, oily, etc).

In the case of poorly yielding wells where the minimum three casing evacuations cannot be mad the well is allowed to recover until enough sample volume can be removed for the necessary

analyses. This may require going back to a well several hours after it was initially evacuated to dryness or returning the following day to obtain the samples.

For those clean monitor wells which do not contain free product or dissolved creosote constituents, the purged water is disposed of on the ground surface. For those sampled wells that historically contain either dissolved phase or free product, the drummed purge water is disposed of by a licensed waste hauler.

Field Measurements and Field QA/QC Procedures

Groundwater samples are collected in inert containers (ie, plastic beakers or glass bottles) and analyzed during the purging process for field determinations of pH, specific conductivity, turbidity and temperature. Following instrument calibration according to manufacturer specifications, the calibration data is recorded in a field calibration book, and field measurements for each of the samples is recorded on the field parameter form.

Groundwater samples are collected for field measurements during the purging process after successive casing volumes have been removed. Specific conductivity, pH and temperature are measured after the first, second and third casing volumes have been removed. Criteria for no further purging is met when three successive casing volumes are purged and pH readings vary by no more than ±0.1 units, conductivity readings vary by 10% or less, and temperature varies by no more than 0.2°C. No specific criteria to cease purging are tied to the turbidity readings since no amount of well development/well purging has eliminated elevated turbidity readings from many of the site monitor wells. Still, a single turbidity reading is recorded only after the pH, specific

conductivity, and temperature measurements are determined to be stable. The samples on whic the field measurements are obtained are discarded into the 55 gallon collection drum and the beakers are rinsed with deionized water.

Equipment Blanks - Because of the use of dedicated sampling devices, equipment blanks are no generally collected. If dedicated sampling equipment is not used, equipment blanks are prepare using "organic free" water that is placed in direct contact with the sampling equipment, followed by collecting the water in appropriate containers for analysis. This action will determine if contamination of samples could occur from sampling methodology or from poor decontaminatio methods.

Trip Blanks - Trip blanks are provided by the laboratory only when sampling events include analysis for volatile organic compounds. Contaminants found in the analysis of trip blanks may be attributed to 1) an interaction between the sample and container or 2) a handling/storage procedure. Trip blank procedures would be required under conditions in which volatiles are present in the groundwater samples so that possible sample contaminant sources could be identified. Routine, analytical requirements of the facility are directed to semi-volatiles, not volatiles, and therefore trip blanks are not ordinarily used.

For those special programs where volatile organics may be measured (Confirmatory Sampling, RI/FS activities, etc), trip blanks will accompany the samples to and from the field.

Sample Collection

Following well purging and field measurement determinations, sample containers are filled during the routine sampling events in the following order: 1) volatile organics (collected as soon as sufficient volume is available to fill 40ml VOA vials); 2) extractable organics. If a regulatory agency should require an extended sampling event, to include the analysis of non-routine parameters, they would be filled in the following order: 1) volatile organics (collected as soon as sufficient volume is available to fill 40ml VOA vials; 2) volatile organic halogens; 3) total organic halogens; 4) total organic carbon; 5) extractable organics; 6) total metals; 7) dissolved metals; 8) phenols; 9) cyanide; 10) sulfate and chloride; 11) turbidity; 12) nitrate and ammonia; 13) radionuclides. KMC-LLC has contracted with Southwest Laboratory (SWL) of (Broken Arrow), Oklahoma, to do the laboratory analyses.

All sample containers are shipped to the Meridian facility by SWL with labeled bottles, field parameter forms (Table 1) and chain of custody forms (Table 3). Sample bottles for each well are coded with the appropriate monitor well designations.

Water samples for laboratory analyses are filled into appropriate clean containers. Sample containers for organic analyses are amber glass bottles with Teflon-lined caps. Samples requiring volatile organic analyses are small glass vials with Teflon septa. Samples for inorganic metal analyses are collected in either glass or plastic containers. Sample containers which are to be used for organic analyses are filled to the top to eliminate any headspace and therefore the possible change in certain volatile constituents. Preservation methods and holding times for each analytical parameter, as well as the sample container type are included on Table 4.

TABLE 3

CHAIN OF CUSTODY RECORD

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
1700 W. Albany • Broken Arrow, Oklahoma 74012
Office: 918-251-2858 • Fax 918-251-2599

SAMPLING FIRM	CLIENT CONTACT	PHONE NUMBER

PROJECT NUMBER	PROJECT NAME

SAMPLERS: *(Signature)*

STA. NO	DATE	TIME	COMP.	GRAB	STATION LOCATION	MATRIX	NO OF CONTAINERS	ANALYTICAL TESTS REQUESTED	REMARKS

RELINQUISHED BY: *(Signature)*	DATE	TIME	RECEIVED BY: *(Signature)*

RELINQUISHED BY: *(Signature)*	DATE	TIME	RECEIVED BY: *(Signature)*

RELINQUISHED BY: *(Signature)*	DATE	TIME	RECEIVED BY: *(Signature)*

RELINQUISHED BY: *(Signature)*	DATE	TIME	RECEIVED BY: *(Signature)*

RELINQUISHED BY: *(Signature)*	DATE	TIME	RECEIVED FOR LABORABORY BY: *(Signature)*

TABLE 4 RECOMMENDATION FOR SAMPLING AND PRESERVATION OF SAMPLES ACCORDING TO MEASUREMENT[1]

Measurement	Vol. Req. (mL)	Container[2]	Preservative[3,4]	Holding Time[5]
Physical Properties				
Color	50	P,G	Cool, 4°C	48 Hrs.
Conductance	100	P,G	Cool, 4°C	28 days
Hardness	100	P	HNO_3 to pH <2	6 mos.
Odor	200	G only	Cool, 4°C	24 Hrs.
pH	2	P,G	None Req.	Analyze Immediately
Residue				
Filterable	100	P,G	Cool, 4°C	7 days
Non-Filterable	100	P,G	Cool, 4°C	7 days
Total	100	P,G	Cool, 4°C	7 days
Volatile	100	P,G	Cool, 4°C	7 days
Settleable Matter	1,000	P,G	Cool, 4°C	48 Hrs.
Temperature	1,000	P,G	None Req.	Analyze
Turbidity	100	P,G	Cool, 4°C	48 Hrs.
Metals				
Dissolved	200	P	Filter on site HNO_3 to pH <2	6 Mos.
Suspended	200		Filter on site	6 Mos.[8]
Total	100	P	HNO_3 to pH <2	6 Mos.
Chromium^{+6}	200	P	Cool, 4°C	24 Hrs.
Mercury (Dissolved)	100	P	Filter HNO_3 to pH <2	28 Days
Mercury (Total)	100	P	HNO_3 to pH <2	28 Days

(from Quality Assurance Manual, Southwest Laboratory of Oklahoma, July 15, 1996)

TABLE 4 (CONTINUED)

Measurement	Vol. Req. (mL)	Container[2]	Preservative[3,4]	Holding Time[5]
Inorganics, Non-Metallics				
Acidity	100	P,G	Cool, 4°C	14 Days
Alkalinity	100	P,G	Cool, 4°C	14 Days
Bromide	100	P,G	None Req.	28 Days
Chloride	50	P,G	None Req.	28 Days
Chlorine	200	P,G	None Req.	Analyze Immediately
Cyanides	500	P,G	Cool, 4°C NaOH to pH >12 0.6g ascorbic acid[6]	14 Days[7]
Fluoride	300	P,G	None Req.	28 Days
Iodide	100	P,G	Cool, 4°C	24 Hrs.
Nitrogen				
Ammonia	400	P,G	Cool, 4°C H_2SO_4 to pH <2	28 Days
Kjeldahl, Total	500	P,G	Cool, 4°C H_2SO_4 to pH <2	28 Days
Nitrate plus Nitrite	100	P,G	Cool, 4°C H_2SO_4 to pH <2	28 Days
Nitrate[9]	100	P,G	Cool, 4°C	48 Hrs.
Nitrite	50	P,G	Cool, 4°C	48 Hrs.
Dissolved Oxygen				
Probe	300	G bottle and top	None Req.	Analyze Immediately
Winkler	300	G bottle and top	Fix on site and store in dark	8 Hrs.
Phosphorus				
Ortho-phosphate Dissolved	50	P,G	Filter on site Cool, 4°C	48 Hrs.
Hydrolyzable	50	P,G	Cool, 4°C H_2SO_4 to pH <2	28 Days
Total	50	P,G	Cool, 4°C H_2SO_4 to pH <2	28 Days
Total, Dissolved	50	P,G	Filter on site Cool, 4°C H_2SO_4 to pH <2	24 Hrs.
Silica	50	P only	Cool, 4°C	28 Days
Sulfate	50	P,G	Cool, 4°C	28 Days

TABLE 4 (CONTINUED)

Measurement	Vol. Req. (mL)	Container[2]	Preservative[3,4]	Holding Time[5]
Phosphorus (continued)				
Sulfide	500	P,G	Cool, 4°C add 2 mL zinc acetate + 3 NaOH to pH >9	7 Days
Sulfite	50	P,G	None Req.	Analyze Immediately
Organics				
BOD	1,000	P,G	Cool, 4°C	48 Hrs.
COD	50	P,G	Cool, 4°C H_2SO_4 to pH <2	28 Days
Oil & Grease	1,000	G only	Cool, 4°C H_2SO_4 or HCl to pH <2	28 Days
Organic Carbon	25	P,G	Cool, 4°C H_2SO_4 or HCl to pH <2	28 Days
Phenolics	500	G only	Cool, 4°C H_2SO_4 or HCl to pH <2	28 Days
MBAS	250	P,G	Cool, 4°C	48 Hrs.
NTA	50	P,G	Cool, 4°C	24 Hrs.
Purgeable Halocarbons (601)	40	G, Teflon-lined Septum	Cool, 4°C 0.008% $Na_2S_2O_3$[6]	14 Days
Purgeable Aromatic Hydrocarbons (602)	40	G, Teflon-lined Septum	Cool, 4°C, 0.008% $Na_2S_2O_3$[6], HCl to Ph 2	14 Days
Acrylonitrile & Acrolein (603)	40	G, Teflon-lined Septum	Cool, 4°C, 0.008% $Na_2S_2O_3$[6], Adjust pH to 4-5[11]	14 Days
Phenols[12] EPA Method 604	1,000	G, Teflon-lined Cap	Cool, 4°C, 0.008% $Na_2S_2O_3$	7 days until extraction 40 days after extraction
Benzidines[12] EPA Method 605	1,000	G, Teflon-lined Cap	Cool, 4°C, 0.008% $Na_2S_2O_3$[6], H_2SO_4 to pH 2-7[13]	7 days until extraction
Phthalate Esters[12] EPA Method 606	1,000	G, Teflon-lined Cap	Cool, 4°C	7 days until extraction 40 days after extraction
Nitrosamines[12] EPA Method 607	1,000	G, Teflon-lined Cap	Cool, 4°C, store in dark, 0.008% $Na_2S_2O_3$[6]	7 days until extraction 40 days after extraction
Organochlorine Pesticides/PCBs[12] EPA Method 608	1,000	G, Teflon-lined Cap	Cool, 4°C, pH 5-9	7 days until extraction 40 days after extraction.

TABLE 4 (CONTINUED)

Measurement	Vol. Req. (mL)	Container[2]	Preservative[3,4]	Holding Time[5]
Organics (Cont.)				
Nitroaromatics and Isophorone[12]	1,000	G, Teflon-lined	Cool, 4°C, 0.008%	7 days until extraction
EPA Method 609		Cap	$Na_2S_2O_3$[6], store in dark	40 days after extraction
Polynuclear Aromatic Hydrocarbons[12]	1,000	G, Teflon-lined	Cool, 4°C, 0.008%	7 days until extraction
EPA Method 610		Cap	$Na_2S_2O_3$[6], store in dark	40 days after extraction
Haloethers[12]	1,000	G, Teflon-lined	Cool, 4°C, 0.008%	7 days until extraction
EPA Method 611		Cap	$Na_2S_2O_3$	40 days after extraction
Chlorinated Hydrocarbon[12] (612)	1,000	G, Teflon-lined Cap	Cool, 4°C	7 days until extraction 40 days after extraction
TCDD[12]	1,000	G, Teflon-lined	Cool, 4°C, 0.008%	7 days until extraction
EPA Method 613		Cap	$Na_2S_2O_3$[6]	40 days after extraction
Purgeables EPA Method 624	2x40	G, Teflon-lined Septum	Cool, 4°C, 0.008% $Na_2S_2O_3$[6]	14 Days
Base/Neutrals Acids	1,000	G, Teflon-lined	Cool, 4°C, 0.008%	7 days until extraction
EPA Method 625		Cap	$Na_2S_2O_3$[6]	40 days after extraction

1. More specific instructions for preservation and sampling are found with procedures as detailed in EPA-600/4-79-020, revised March 1983, and in the Federal Register, Vol. 49, No. 209, Oct. 26, 1984, EPA 40 CFR part 136.

2. Plastic (P) or Glass (G). Only EPA certified precleaned bottles are used. For metals, polyethylene with a polypropylene cap (no liner) is preferred.

3. Sample preservation should be performed immediately upon sample collection. For composite samples, each aliquot should be preserved at the time of collection. When use of an automated sampler makes it impossible to preserve each aliquot, then samples may be preserved by maintaining at 4°C until compositing and sample splitting is completed.

4. When any sample is to be shipped by common carrier of sent through the United States Mails, it must comply with the Department of Transportation Hazardous Materials Regulations (49 CFR part 172). The person offering such material for transportation is responsible for ensuring such compliance. For the preservation requirements of Table 1, the Office of Hazardous Materials, Materials Transportation Bureau, Department of Transportation has determined that the Hazardous Materials Regulations do not apply to the following materials: Hydrochloric acid (HCl) in water solutions at concentrations of 0.04% by weight or less (pH about 1.96 or greater); Nitric acid (HNO_3) in water solutions at concentrations of 0.15% by weight or less (pH about 1.62 or greater); Sulfuric acid (H_2SO_4) in water solutions at concentrations of 0.35% by weight or less (pH about 1.15 or greater); Sodium hydroxide (NaOH) in water solutions at concentrations of 0.08% by weight or less (pH about 12.30 or less).

5. Samples should be analyzed as soon as possible after collection. The times listed are the maximum times that

TABLE 4 (CONTINUED)

samples may be held before analysis and still considered valid. Samples may be held for longer periods only if the permittee, or monitoring laboratory, has data on file to show that the specific types of sample under study are stable for the longer time, and has received a variance from the Regional Administrator. Some samples may not be stable for the maximum time period given in the table. A permittee, or monitoring laboratory, is obligated to hold the sample for a shorter time if knowledge exists to show this is necessary to maintain sample stability.

6. Should only be used in the presence of residual chlorine.

7. Maximum holding time is 24 hours when sulfide is present. Optionally, all samples may be tested with lead acetate paper before the pH adjustment in order to determine if sulfide is present. If sulfide is present, it can be removed by the addition of cadmium nitrate powder until a negative spot test is obtained. The sample is filtered and then NaOH is added to pH 12.

8. Samples should be filtered immediately on-site before adding preservatives for dissolved metals.

9. For samples from non-chlorinated drinking water supplies concentrated H_2SO_4 should be added to lower sample pH to less than 2. The sample should be analyzed before 14 days.

10. Sample receiving no pH adjustment must be analyzed within seven days of sampling.

11. The pH adjustment is not required if acrolein will be measured. Samples for acrolein receiving no pH adjustment must be analyzed within three days of sampling

12. When the extractable analytes of concern fall within a single chemical category, the specified preservative and maximum holding times should be observed for optimum safeguard of sample integrity. When the analytes of concern fall within two or more chemical categories, the sample may be preserved by cooling to 4°C, reducing residual chlorine with 0.008% sodium thiosulfate, storing in the dark, and adjusting the pH to 6-9; samples preserved in this manner may be held for seven days before extraction and for 40 days after extraction. Exceptions to this option preservation and holding time procedure are noted in footnote 6 (requirement for thiosulfate reduction of residual chlorine).

13. If 1,2-diphenylhydrazine is likely to be present, adjust the sample pH to 4.0 + 0.2 to prevent rearrangement to benzidine.

All sample containers used by KMC-LLC are obtained from the contract laboratory as outlin Appendix A. The contract laboratory purchases containers that have been pre-cleaned by a vendor according to EPA methodology. Sample containers are never re-used.

Split Sampling Events

In the event an authorized regulatory agency wishes to obtain split samples, it is the agency's responsibility to supply their own collection containers and preservatives. Well purging will b done according to this Sampling and Analysis Plan, and sample containers will be filled alternately between KMC-LLC and the regulatory agency.

Sample Preservation and Shipment

Immediately after collection, all samples are stored in an insulated sample shuttle (chest) and cooled to 4°C with ice. Those samples to be analyzed for volatile organics are sometimes preserved with hydrochloric acid to extend the hold time before samples have to be analyzed. Samples to be analyzed for the extractable hydrocarbons are preserved only by keeping them o ice. Samples to be analyzed for other, non-routine analyses for this site (in the event of an extended sampling) are preserved according to the preservatives shown on Table 4. Samples to be analyzed for "dissolved metals" are field filtered through a 0.45µ filter before being preserve with nitric acid.

Samples are generally shipped on the day they are collected in the insulated shuttle mentioned above, but in no case are held longer than 24 hours before shipped. Depending on the number c samples in a cooler, "blue ice" ice packs may number six or more per chest. Alternatively, the

samples are carefully packed in regular ice. All samples are shipped via overnight express delivery service to the laboratory (SWL) and are accompanied with field parameter forms and chain of custody forms.

Contaminated Equipment Disposal

All contaminated field equipment will be disposed of in accordance with applicable local, state and federal regulations.

FIELD CHAIN OF CUSTODY

SWL prepares all sample shuttles with the necessary type and number of bottles to be filled and ships the shuttles to the facility. Accompanying the shuttles are field parameter forms and chain of custody forms which are placed inside the shuttles. The field technician doing the sampling will inspect the shuttles for tampering when he arrives at the facility before sampling.

Following sample collection, the field technician prepares the shuttles for shipment back to SWL. The shuttles are packed with bottles, ice or "blue ice", field parameter and chain of custody forms and are shipped via overnight express delivery back to SWL where the shuttles are inspected on arrival for evidence of tampering. A custody seal is placed across the opening of the shuttle such that it must be broken to gain access to the bottles. A broken seal may indicate the possibility that the bottles were tampered with before arrival at the lab.

Upon arrival at the lab, the shuttle is opened and the chain of custody form signed as to the date and time opening occurred. Additional sample preservation techniques (if required) and storage are logged on a laboratory chain of custody form from this point forth.

LABORATORY SAMPLE CUSTODY LOG

Once the sample shuttle arrives at the laboratory, the shuttle is checked and stored in a secure area prior to analysis. The sample custodian records the disposition of each sample to an analyst or technician on the sample custody log shown in Table 5. The use of the sample in each sample bottle is also documented along with the appropriate testing procedure. The record shows for each link in the process, the person with custody and the date each person accepted or relinquished custody.

DATA REPORTING

KMC-LLC will report all routine, quarterly analytical data to the appropriate regulatory agency by way of a semi-annual report, unless specified otherwise in the facility permit. Data generated during a Confirmatory Sampling program, RI/FS study, or for other reasons required by the MDEQ or USEPA will be submitted per agreement with the regulatory agencies.

INTERNAL CHAIN OF CUSTODY
SAMPLE TRACKING SHEET
SDG NUMBER : 401
FRACTION : ICP
MATRIX : Water

SWOK/AATS

WALK-IN DATE LOGGED-IN/ ANALYST	SAMPLE #	CASE/SAMPLE ID	NC	DATE LOGGED-OUT FOR PREP/ ANALYST	DATE RETURNED TO WALK-IN/ ANALYST	DATE DISCARDED/ ANALYST
01/24/91	4876.01	MFN444 (CASE#15714)	2			
01/24/91	4876.02	MFN448 FIELD BLANK	2			
01/24/91	4876.05	MFN458 (CASE#15714)	2			
01/24/91	4876.06	MFN459 (CASE#15714)	2			
01/24/91	4876.07	MFN460 (CASE#15714)	2			
01/24/91	4876.08	MFN461 (CASE#15714)	2			
01/24/91	4876.13	MFN466 (CASE#15714)	2			
01/24/91	4876.14	MFN467 (CASE#15714)	2			
01/24/91	4876.15	MFN468 (CASE#15714)	2			
01/24/91	4876.16	MFN469 (CASE#15714)	2			

TABLE 5: LABORATORY CHRONICLE

SURFACE WATER SAMPLING PROTOCOL

INTRODUCTION

Surface water sampling is an important part of the overall facility sampling program. The potential impact(s) to surface water quality from groundwater discharges or facility operations must be defined and documented. All sampling procedures listed below must be followed to ensure the collection and analysis of representative surface water samples. Surface water samples in this text generally refer to streams, but may also include springs, seeps, and impoundments.

STEPS TAKEN PRIOR TO OBTAINING WATER SAMPLE

Initial Observations

Field personnel who obtain surface water samples for KMC-LLC record site weather conditions for the sampling date on the field parameter form. A notation is made for unusual weather events just prior to sampling (for example, drought, heavy rain previous week, etc.). The presence of a floating or settled immiscible liquid in the stream is noted. Other observations are recorded if deemed appropriate.

OBTAINING A WATER SAMPLE

Sample Collection

Grab samples are taken from surface water bodies from either the shore or by wading into the stream. When sampling streams, the field sampler turns toward the upstream direction and dips the sample bottles to just below the water surface. Filling and capping the bottles under water eliminates the potential of headspace in the bottles, particularly important where the measurement of organics is concerned. Sampling is performed beginning at the furthest-most downstream

location first and progressing upstream to avoid the possibility of impacting downstream samples from suspended sediment, etc.

For those bottles that have already been prepared with preservatives by the laboratory, (for example, bottles for metals analyses are preserved with nitric acid), the bottles are filled with sample poured from one of the other bottles. This eliminates the loss of preservative that may otherwise occur if such bottles were filled under water. Any sample transfer between bottles is done slowly and in a manner to prevent the loss of volatiles.

Field Measurements and Field QA/QC Procedures

The field technician measures specific conductivity, pH and temperature at each surface water sampling location. Specific conductivity and pH are measured in quadruplicate at the time of sampling and recorded on the field parameter form.

Sample Preservation and Shipment

The sample preservation and shipment procedures described in the groundwater sampling section (see p. 18) pertain to samples collected from surface waters. Reference is made to that section for complete details.

FIELD CHAIN OF CUSTODY

Field chain of custody protocol for surface water samples in no way differs from that described in the groundwater sampling section (see p. 19). Refer to that section for complete details.

LABORATORY SAMPLE CUSTODY LOG

Laboratory sample custody for stream samples in no way differs from that described in the groundwater sampling section (see p. 20). Refer to that section for complete details.

DATA REPORTING

KMC-LLC will report all routine, quarterly analytical data to the appropriate regulatory agency by way of a semi-annual report, unless specified otherwise in the facility permit. Data generated during a Confirmatory Sampling program, RI/FS study, or for other reasons required by the MDEQ or USEPA will be submitted per agreement with the regulatory agencies.

SURFACE AND NEAR SURFACE SOIL SAMPLING PROTOCOL

Surface and near surface soil samples (depth: 0 to 1 meter) will be collected following procedures described in "Preparation of Soil Sampling Protocol: Techniques and Strategies," an EPA document prepared by Benjamin J. Mason (1983). (A copy of an appropriate section of this document is contained in Appendix B). Generally, the procedures allow for the use of soil punches, scoops and shovel, soil probes and augers, and power augers.

INITIAL OBSERVATIONS

Soil sampling locations will be marked in the field and referenced on field parameter and chain of custody forms so as to enable re-sampling of that exact location at a later date, if necessary. Weather conditions on the sampling date will be described as will any unusual weather events (i.e., drought) just prior to the sampling. Other appropriate notes will be made as deemed necessary.

OBTAINING SOIL SAMPLES

Depending upon the required laboratory analyses, soil samples will be collected using various methods. Surface and near surface samples that require chemical testing (i.e., wet analyses) will be collected with soil punches, scoops, shovels, probes or augers and stored in glass jars. Those sample to be tested for physical parameters (i.e., permeability, Atterburg Limits, etc.) will be collected using dedicated Shelby (thin walled) tubes advanced by a drill rig. Both ends of the Shelby tube will be capped and secured upon retrieval from a hole so as to create no disturbance to the sample.

Soil samples collected with scoops, shovels, probes and augers will be described according to ASTM Method D2488, Description and Identification of Soils (Visual Manual Procedures).

Field Compositing

Where composite samples must be taken, compositing will be done with large glass or stainless steel mixing bowls. In each case, clods of soil will be broken up before being mixed with hand tools. Following mixing, the soil will be placed in a pile, sectioned into four quarters, and a small sample from each quarter will be taken and mixed together to form the composite. The composite will then be placed in a glass jar and shipped with the rest of the samples to the laboratory. The excess soil will be discarded.

Sample Preservation

Soil samples collected in jars for wet chemistry analyses will be stored at 4°C in the sample shuttle pack and shipped to the laboratory within 24 hours of collection via overnight express

delivery. Other than capping both ends of a Shelby tube, no special preservation procedures will occur for these type samples.

Decontamination Procedures

All sampling implements will be decontaminated between use with a steam cleaner or in a detergent solution (i.e., Alconox or similar), followed by rinsing with clean water.

FIELD CHAIN OF CUSTODY

Chain of custody forms will accompany all soil samples collected and shipped for analyses (see page 19).

LABORATORY SAMPLE CUSTODY LOG

A laboratory sample custody log will accompany all samples undergoing analyses. A complete description of this procedure is described in the groundwater sampling section (see page 20).

DATA REPORTING

KMC-LLC will report all routine, quarterly analytical data to the appropriate regulatory agency by way of a semi-annual report, unless specified otherwise in the facility permit. Data generated during a Confirmatory Sampling program, RI/FS study, or for other reasons required by the MDEQ or USEPA will be submitted per agreement with the regulatory agencies.

SUB-SURFACE SOIL SAMPLING PROTOCOL

Sub-surface soil sampling refers to those procedures used to obtain soil samples from a depth of greater than 1 meter. In some instances, small portable power augers may be useful to slightly greater depths, but generally the procedures require the use of a drill rig and Shelby tube (thin wall) or split-barrel (split-spoon) devices.

INITIAL OBSERVATIONS

Borehole locations will be referenced on field parameter and chain of custody forms to permanent/semi-permanent structures and located on facility site drawings. (In some cases, it may be necessary to survey exact location of the borings). Weather conditions on the sampling date will be described as will any unusual weather conditions leading up to the sampling date. Other appropriate notes may be made as necessary.

OBTAINING SUB-SURFACE SOIL SAMPLES

Some borings will require either continuous or intermittent sampling from grade level to total depth. Such samples will be collected by either the use of dedicated Shelby (thin walled) tubes or split-barrel (split-spoon) devices. Shelby tube samples will be collected following the method described in ASTM Method D1587 and split-barrel samples will be collected following ASTM Method D1586.

All boreholes will be visually logged from grade level to the target depth. Soil and formation description will follow ASTM Method D2488, with notes also made as to water level and visual

or olfactory evidence of contamination. A photoionization detector or comparable instrument may be used in the field to screen logged samples for volatile constituents.

Borings not completed as monitor wells will be grouted back to the surface using a tremie line and Type I Portland cement with 5 percent bentonite (see page 33 of this document).

Field Compositing

Where composite samples must be taken, compositing will be done with large glass or stainless steel mixing bowls. In each case, clods of soil will be broken up before being mixed with hand tools. Following mixing, the soil will be placed in a pile, sectioned into four quarters, and a small sample from each quarter will be taken and mixed together to form the composite. The composite will then be placed in a glass jar and shipped with the rest of the samples to the laboratory. The excess soil will be discarded.

Sample Preservation

Soil samples collected off auger flights or from the split barrel for wet chemistry analyses will be stored in glass jars and kept at 4°C and shipped to the laboratory within 24 hours of collection via overnight express delivery. No special preservation will be done on the Shelby tube samples other than capping both ends of the tube after removal from the borehole.

Decontamination Procedures

All sampling implements will be decontaminated between use with a steam cleaner or in a detergent solution (i.e. Alconox or similar), followed by rinsing with clean water.

FIELD CHAIN OF CUSTODY

Chain of custody forms will accompany all soil samples collected and shipped for analyses (see page 19 for complete details).

LABORATORY SAMPLE CUSTODY LOG

A laboratory sample custody log will document sample disposition in the laboratory (see page 20 for complete details).

DATA REPORTING

KMC-LLC will report all routine, quarterly analytical data to the appropriate regulatory agency by way of a semi-annual report, unless specified otherwise in the facility permit. Data generated during a Confirmatory Sampling program, RI/FS study, or for other reasons required by the MDEQ or USEPA will be submitted per agreement with the regulatory agencies.

ANALYSES OF ALL WATER AND SOIL SAMPLES

WET CHEMICAL ANALYSES

All water and soil samples submitted to the contract analytical laboratory for analyses will be handled and analyzed according to the highest standards. Most analytical methodologies originate from USEPA SW-846, but a few methods are referenced to EPA procedures. In no way will these analyses be compromised in terms of reliable data, but they are the methods the current contract laboratory (SWL) is set up to perform.

Tables 6 and 7 have been prepared to summarize the methods the contract laboratory will use for water quality and soil analyses, respectively.

SPECIAL ANALYSES

The contract laboratory uses a gas chromatography procedure for naphthalene, acenaphthylene and acenaphthene for those monitor well samples which may have a history of high levels of K001 constituents. The procedure is equivalent to USEPA Method 610 and SW-846 Methods 3510 and 8100, and yields a reporting limit of 25 ug/l for aqueous matrices. This method is used for those monitor wells mutually agreed upon by Kerr-McGee Chemical LLC and the regulatory agency. Currently, no monitor wells are analyzed using this screening procedure.

PHYSICAL (SOIL) TESTING

Some soil samples may be submitted to a soils-testing laboratory for the determination of physical properties of that sample. As yet, testing parameters have not been specified, but may include such parameters as 1) particle size analysis (ASTM Method D421/D422); 2) permeability-constant head (ASTM Method D2434); 3) Atterberg Limits (ASTM Method D4318). Any other physical testing that may be required will also comply with ASTM specifications.

LABORATORY QA/QC PROGRAM

The contract analytical laboratory performing the wet chemical analyses has provided a copy of their quality assurance project plan. This information is provided in Appendix A.

TABLE 6: ANALYTICAL METHODOLOGIES FOR WATER SAMPLES

Parameter	Prep	SW846 Method	EPA Method	Holding Times
Conductivity		9050		Done on-site
pH		9040		Done on-site
TOC			415.1	28 days
TOH		9020		7 days
Chloride			325.3	28 days
Iron	3010	6010A		6 months
Manganese	3010	6010A		6 months
Sodium	3010	6010A		6 months
Sulfate			375.4	28 days
Barium	3010	6010A		6 months
Cadmium	3020	6018		6 months
Fluoride			340.2	28 days
Nitrate			353.2	28 days
Mercury		7470A		28 days
Selenium	3020	7740		6 months
Silver	3010	6010A		6 months
Arsenic	3020	7740		6 months
Chromium	3010	6010A		24 hours
Lead	3010	6010A		6 months
Cyanides		9010A		14 days
Total Recoverable Petroleum Hydrocarbons			418.1	28 days
Phenols			420.2	40 days
Acid/Base/Neutral Extractables	3520	8270A		40 days
Volatile Organics	5030	8240A		14 days
Organochlorine Pesticides			608/625	40 days
Chlorinated Herbicides	3550	8150A		40 days
Radium			903.1	6 months
Gross Alpha			900.0	6 months
Gross Beta			900.0	6 months
Coliform Bacteria			180.0	6 hours
BTEX	5030	8020		14 days
Naphthalene, Acenaphthylene, Acenaphthene	3510	610		40 days

TABLE 7: ANALYTICAL METHODOLOGIES FOR SOIL SAMPLES

Parameter	Prep	SW846 Method	EPA Method	Holding Times
pH		9040		Done on-site
TOH		9020		7 days
Chloride			300	28 days
Iron	3050	6010A		6 months
Manganese	3050	6010A		6 months
Sodium	3050	6010A		6 months
Sulfate			375.3	28 days
Barium	3050	6010A		6 months
Cadmium	3050	6018		6 months
Fluoride			300	28 days
Nitrate			300	28 days
Mercury		7471A		28 days
Selenium	3020	7740		6 months
Silver	3050	6010A		6 months
Arsenic	3020	7060		6 months
Chromium	3050	6010A		24 hours
Lead	3050	6010A		6 months
Cyanides		9010A		14 days
Total Recoverable Petroleum Hydrocarbons		9073		28 days
Acid/Base/Neutral Extractables	3540	8270A		40 days
Volatile Organics	5030	8240A		14 days
BTEX	5030	8020		14 days
Naphthalene, Acenaphthylene, Acenaphthene	3510	8100		40 days

SWL implements varied quality control procedures routinely during normal operational procedures. For example:

- EPA known ampules are available for the analyst to dilute and analyze to determine precision.
- EPA blind samples are made according to the quality control director's predetermined amounts and then processed through the laboratory as ordinary samples. The results are checked for accuracy.
- Standards, field blanks, duplicates and spikes are analyzed along with each parameter tested and results are incorporated with the final report.

Because physical testing of the soils has not yet been designed, a laboratory QA/QC program for these tests has not been prepared. All testing, however, will be done in accordance with ASTM specifications.

Laboratory Spike

A laboratory spike is a known concentration of standard added to a specific volume of sample which is then analyzed and compared to the calculated results. This determines percent recovery and is included on the final report. Laboratory spikes are run on at least 5 percent of the samples.

Laboratory Duplicate

A laboratory duplicate is performed by analyzing a sample twice at different points during a run and comparing results to determine accuracy. This is reported as percent difference and is also included in the final report. Duplicates are run on at least 5 percent of the samples.

WELL INSTALLATION/ABANDONMENT PROCEDURES

All groundwater monitor wells have been installed so as to yield representative groundwater quality data. Installation methods will include the use of hollow stem auger with a five-foot continuous sampler barrel or rotary wash drilling techniques with minimal introduction of drilling fluid into the borehole. If the continuous sampler yields less than adequate sample recovery (<50%), the field geologist may elect to log all borings using either the split spoon method or by the cuttings.

Temporary wells may remain open-hole completed if all that is required is a water level elevation measurement or a grab sample for chemical analysis. Temporary wells will be plugged within two days after being drilled by cementing them with a tremie line from total depth to grade using a neat Portland Type I cement with 5 percent bentonite. Any monitor wells needing to be abandoned or replaced will be drilled out or casing pulled out in its entirety. If borehole collapse occurs or casing/screen remains in the hole, the borehole will be drilled out before plugging with a tremie line and neat cement/bentonite grout. If the casing or screen cannot be removed or drilled out, the casing is cut at ground surface and is filled using a tremie line with cement mixed with 5 percent bentonite. Well abandonment/plugging report forms will be filed, as appropriate, with the Mississippi Department of Environmental Quality.

Wells installed for longer term monitoring will be 2 inches or larger in diameter and constructed of PVC or stainless steel (as agreed upon between KMC-LLC and the regulatory agency). All joints will be flush threaded without the use of cementing compounds.

Monitor well completion will be in accordance with the guidelines contained in the "RCRA Groundwater Monitoring Technical Enforcement Guidance Document" (1986). Specifically, the annular space between the screen and borehole will be filled with a filter pack of proper gradation to provide mechanical retention of the formation sand and silt. The filter pack typically extends two to five feet above the top of the well screen. At the bottom of the screen will be a dense phase sampling cup of teflon or stainless steel, at least 0.5 feet in length.

A minimum of two feet of bentonite pellets will be placed immediately above the filter pack in the annular space between the well casing and borehole. Above the bentonite seal will be a cement/bentonite grout mixture consisting of 3 to 5 pounds of bentonite per 94 pound sack of cement with approximately 6.5 gallons of water. A tremie line will be used to place the grout from depth to three feet below grade level. Following a suitable amount of time to allow grout settlement, the annular space from three feet below grade to grade level will be sealed with concrete, blending into a cement apron extending three feet from the outer edge of the borehole. Figure 1 has been reproduced from the "RCRA Groundwater Monitoring Technical Enforcement Guidance Document" (1986) to show how the wells will be constructed.

Following well completion, well development will be initiated to remove any fluids used during drilling and to remove fines from the natural formation to provide a particulate free discharge. Development will be done by reversing flow direction or surging the well. No fluids other than natural formation water will be added during development, and any collected water remaining from the development process will be properly disposed. A locking cap will be placed on all wells.

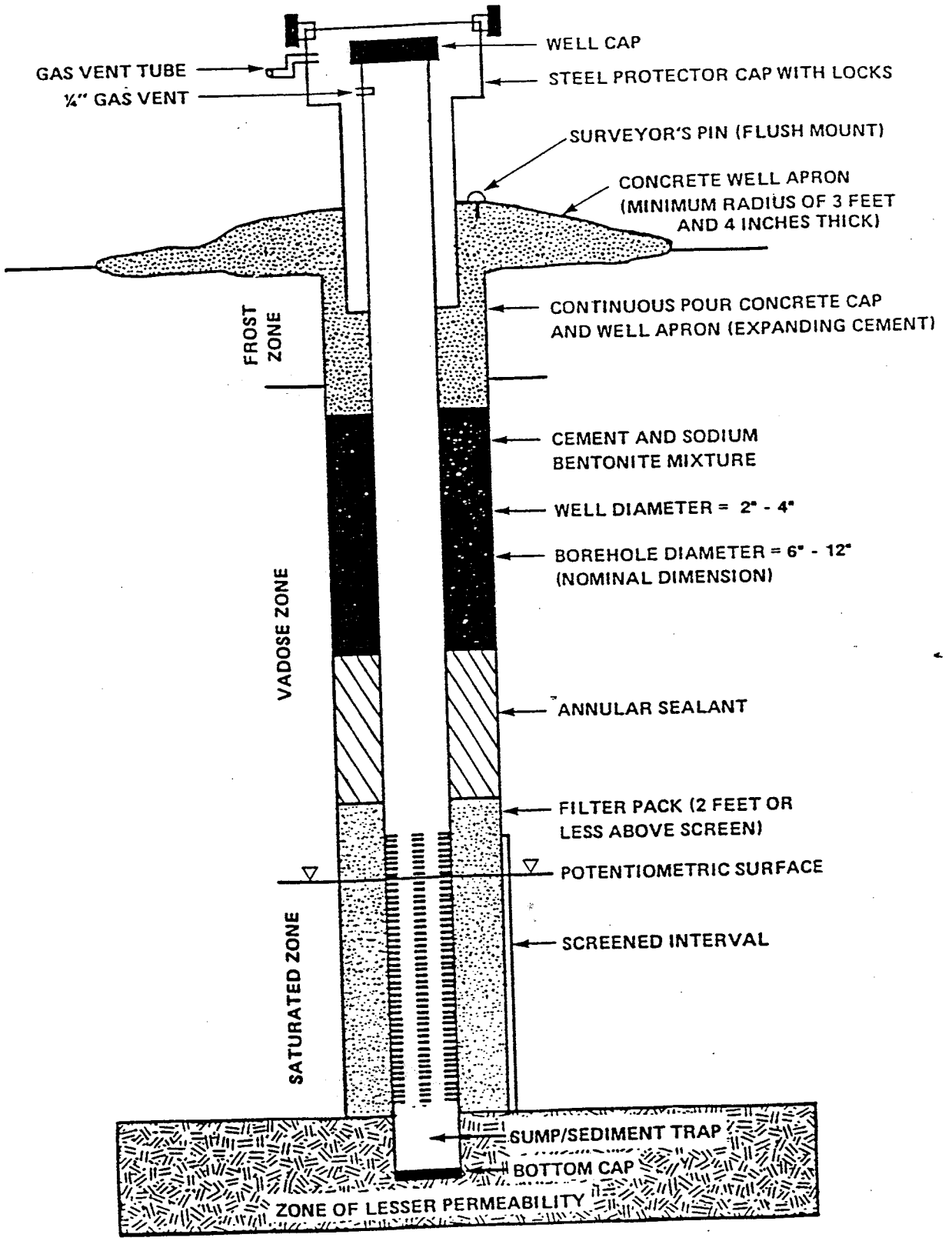


FIGURE 1: GENERAL MONITORING WELL CROSS-SECTION
(modified from RCRA Technical Enforcement Guidance Document)

A record of drilling (Table 8) and well construction details (Figure 2) will be completed for all wells/borings. The record will include:

- date/time of construction
- drilling method/fluid use
- well location (±0.5 ft.)
- borehole diameter and well casing diameter
- well depth (±0.1 ft.)
- drilling and lithologic logs
- depth to first saturated zone
- casing material
- screen material and design
- casing and screen joint type
- screen slot size length
- filter pack material/size
- filter pack volume
- filter pack placement method
- sealant materials
- sealant volume
- sealant placement method
- surface seal design/construction
- well development procedure
- type of protective well cap

TABLE 8

SOIL BORING LOG KM—5655-A

KERR-McGEE CORPORATION Hydrology Dept. Engineering Services	KM SUBSIDIARY	LOCATION	BORING NUMBER

DEPTH IN FEET	LITHOLOGIC DESCRIPTION	GRAPHIC LOG	UNIFIED SOIL FIELD CLASS.	BLOWS PER FOOT	PID (ppm)	SOIL SAMPLE NO.	SOIL SAMPLE TYPE	SOIL SAMPLE DEPTH	SOIL SAMPLE REC.	REMARKS OR FIELD OBSERVATIONS

EXPLANATION

- ▼ Water Table (24 Hour)
- ▽ Water Table (Time of Boring)
- PID Photoionization Detection (ppm)
- NO. Identifies Sample by Number
- TYPE Sample Collection Method

SPLIT-BARREL; AUGER; ROCK CORE; THIN-WALLED TUBE; CONTINUOUS SAMPLER; NO RECOVERY

DEPTH Depth Top and Bottom of Sample
REC. Actual Length of Recovered Sample in Feet

GRAPHIC LOG LEGEND

CLAY; SILT; SAND; GRAVEL; SILTY CLAY; CLAYEY SILT; DEBRIS FILL; HIGHLY ORGANIC (PEAT); SANDY CLAY; CLAYEY SAND; ☐ _____; ☐ _____

DATE DRILLED | PAGE of

DRILLING METHOD

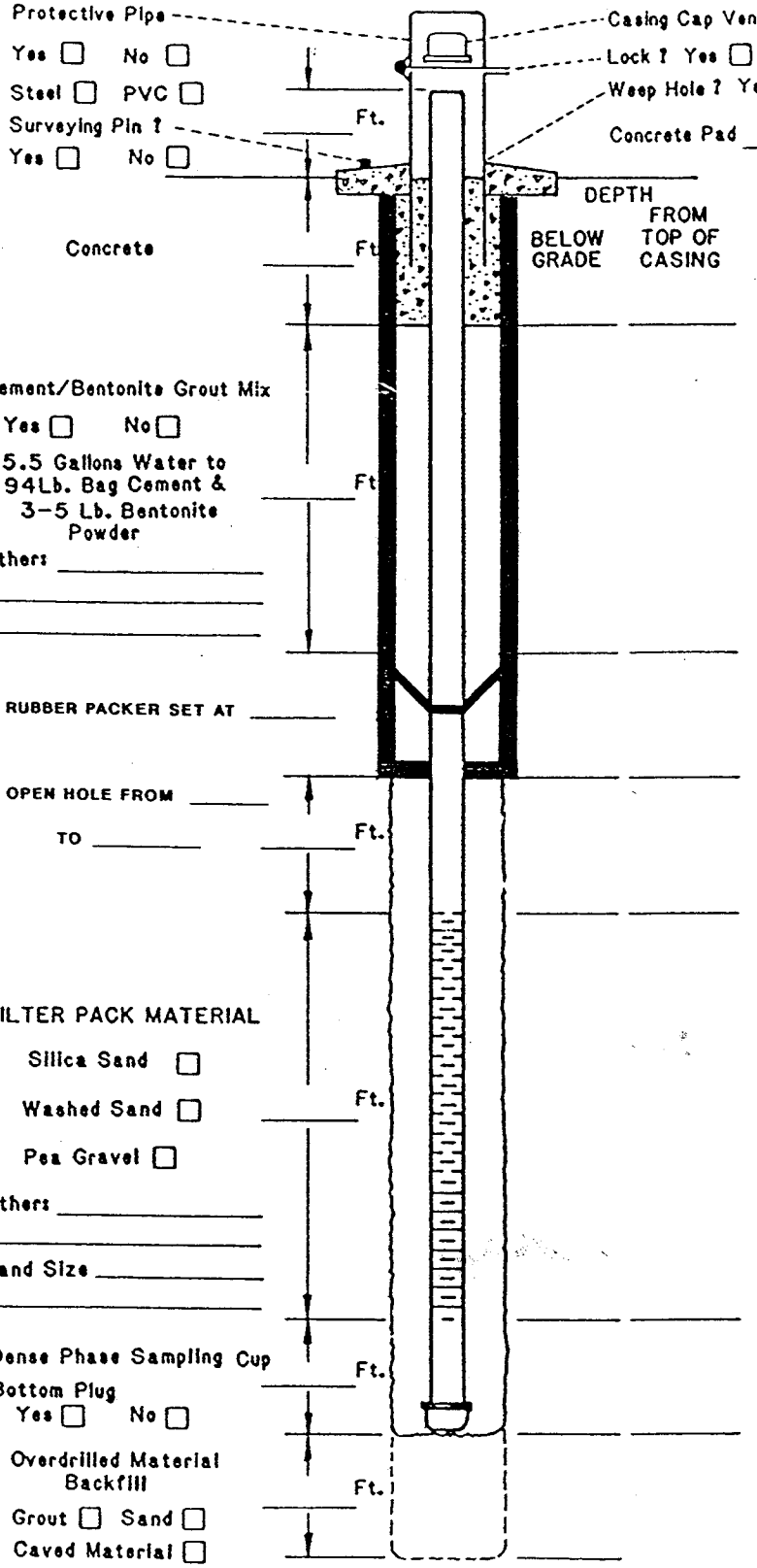
DRILLED BY

LOGGED BY

EXISTING GRADE ELEVATION (FT. AMSL)

LOCATION OR GRID COORDINATES

FIGURE 2: KERR-McGEE CORPORATION
HYDROLOGY DEPARTMENT
MONITORING WELL INSTALLATION DIAGRAM



DRILLING INFORMATION:

1. Borehole Diameter= _____ inches.
2. Were Drilling Additives Used ? Yes ☐ No ☐
   Revert ☐ Bentonite ☐ Water ☐
   Solid Auger ☐ Hollow Stem Auger ☐
3. Was Outer PVC Casing Used ? Yes ☐ No ☐
   Depth= _____ to _____ Feet.
4. Borehole Diameter for Outer Casing _____ inches.

WELL CONSTRUCTION INFORMATION:

1. Type of Casing: PVC ☐ Galvanized ☐ Teflon ☐
   Stainless ☐ Other _____
2. Type of Casing Joints: Screw-Couple ☐ Glue-Couple ☐ Other _____
3. Type of Well Screen: PVC ☐ Galvanized ☐
   Stainless ☐ Teflon ☐ Other _____
4. Diameter of Casing and Well Screen:
   Casing _____ inches, Screen _____ inches.
5. Slot Size of Screens:
6. Type of Screen Perforation: Factory Slotted ☐
   Hacksaw ☐ Drilled ☐ Other _____
7. Installed Protector Pipe w/Lock: Yes ☐ No ☐

WELL DEVELOPMENT INFORMATION:

1. How was Well Developed ? Bailing ☐ Pumping ☐
   Air Surging (Air or Nitrogen) ☐ Other _____
2. Time Spent on Well Development ?
   _____ / _____ Minutes/Hours
3. Approximate Water Volume Removed ? _____ Gallons
4. Water Clarity Before Development ? Clear ☐
   Turbid ☐ Opaque ☐
5. Water Clarity After Development ? Clear ☐
   Turbid ☐ Opaque ☐
6. Did Water have Odor ? Yes ☐ No ☐
   If Yes, Describe _____
7. Did Water have any Color ? Yes ☐ No ☐
   If Yes , Describe _____

WATER LEVEL INFORMATION:

Water Level Summary (From Top of Casing)

During Drilling _____ Ft. Date _____
Before Development _____ Ft. Date _____
After Development _____ Ft. Date _____

Driller/Firm _____ Drill Rig Type _____ Date Installed _____

Drill Crew _____ Well No. _____ Kerr-McGee Hydrologist _____

- ground surface elevation
- top of casing elevation (to 0.01 ft MSL)
- detailed drawing of well (including dimensions)

Following well construction, a certification report will be prepared by a qualified geologist or geotechnical engineer which includes an accurate log of the soil boring and depicts the location, elevations, material specifications, construction details and soil conditions encountered in the boring of the well.

All wells will be permanently numbered and surveyed by a licensed surveyor as to location (±0.5 ft) and elevation (MSL) of the top of each well casing (±0.01 ft). Well locations will be plotted on the facility base map.

Repair or replacement of any monitor well will occur if it is determined that the well no longer yields water representative of the formation or if the well has been damaged or vandalized. Repairs to the concrete surface pad will be made if the pad shows excessive deterioration due to damage or weathering.

SITE HEALTH AND SAFETY PLAN

Potential hazards to the health and safety of on-site personnel is included in a Site Health and Safety Plan (Appendix C). Required personal protective equipment, types of exposures that may occur, and how to handle emergency contingencies are included in this Site Health and Safety Plan. The KMC- LLC field technician will carry a copy of the Site Safety Plan with him while

performing groundwater sampling. A copy of the Site Health and Safety Plan will be kept at the facility for contractors to review before conducting sampling activities.

REFERENCES

Annual Book of ASTM Standards - Section 4, Volume 04.08, 1986, ASTM Philadelphia, PA, 1078 p.

Mason, Benjamin, J., 1983 Preparation of Soil Sampling Protocol: Techniques and Strategies, EMSL/USEPA, Las Vegas, NV. EPA-600-4-83-020

Methods for Chemical Analysis of Water and Wastes, 1979, EMSL/USEPA, Cincinnati, OH. EPA-600/4-79-020, Revised, March 1983

National Enforcement Investigation Center Policies and Procedures Manual, EPA-330/9/79/ 001R, October, 1979

RCRA Groundwater Monitoring Technical Enforcement Guidance Document 1986, USEPA. OSWER-9950.1

Standard Methods for the Examination of Water and Wastewater - 16th Edition, 1985, APHA-AWWA-WPCF, Washington, D.C.

Test Methods for Evaluating Solid Waste - Physical/Chemical Methods, 3rd Edition, 1986, USEPA, Washington, D.C. SW846

USEPA Contract Laboratory Program Statement of Work, Soil/Sediment and Water Matrices, Multi-Concentration, Selected Ion Monitoring (SIM), GC/MS Analysis for 2,3,78-TCCD, USEPA 3/84 with 12/86 modifications.

Attachment VI-1

VI-1 List of solid waste management units (SWMUs) and areas of concern (AOCs) requiring no further action at this time:			
SWMU/AOC No/Letter	SWMU/AOC Name	Unit Comment	Dates of Operation
1, 2	Sap Tanks	Two on-ground metal tanks	Pre 1964 - 1986
3, 4 & 5	Work Tanks	Three above ground tanks over a concrete pad with sump	Pre 1964 - 1986
7, 8 & 9	Settlers	Three on-ground metal tanks	1982 - 1986
10 & 11	Auxillary Tanks	Two on-ground metal tanks	1982 - 1986
12	Chemical Oxidation Vessel (COV)	On-ground metal tank	1982 - 1986
14	Pad under Charcoal Filters	Concrete pad	1984
15	Sampling Station	Concrete lined sump	1980 - 1986
16	Lift Station	Concrete lined sump	1980 - 1986
22	Particulate Emission Cyclone	Metal structure	Pre 1964 - 1986
24	Wood Waste Boiler	Brick and metal structure within a building	Pre 1964 - 1975
25	Bag House (pent storage)	Metal structure	Pre 1964 - 1985
26*	Surface Impoundment	323' x 175' surface impoundment lined with native clay, received wastewater from process cylinders and sumps	1962 - 1986
33	Metal Decontamination Bin	Welded metal box	1985
34	Dumpster(s)	Metal boxes	Pre 1964 - 1986
35	Temporary Drum Storage Area	Plastic lined metal drums	1987 - 1989
A	Direct Dumping to Sowashee Creek	Concrete culvert with wooden control gate for wastewater discharge through berm	Pre 1964 - Present
C, D & E	Sewer line Pits	Three pits dug to sewer line (SWMU 27) during a 1984 investigation	1984
* Unit Regulated by Modules III and IV.			

VI-2 List of solid waste management units (SWMUs) and areas of concern (AOCs) requiring Confirmatory Sampling (CS):				
SWMU/AOC No/Letter	SWMU/AOC Name	Unit Comment	Dates of Operation	Potentially Affected Media
6	API Seperator	30' x 20' x 8' deep concrete basin	1980 - 1986	soil, groundwater
13	Cooling Tower Basin	In-ground concrete basin, 75' x 35' x 6' deep	pre 1964 - 1986	soil, groundwater
17	Penta Storage Sump	3' x 3' concrete within concrete curbed tank area	1982 - 1986	soil, groundwater
18	Process Cylinders Sump & Drain	35' x 10' concrete sump and connecting concrete drain	1924 - 1986	soil, groundwater
19	Hot Well	30' x 8' x 8' deep in-ground concrete block sump	1924 - 1986	soil, groundwater
20, 21	Tank Car Loading Sumps	10' x 8 concrete pads with a 4" curb and drain pipe	1982-1986	soil, groundwater
23	Waste Pile	Unlined storage area that received wood chips	Pre 1964 - 1975	soil, groundwater
27	Sewer Line & Sump Area	tile sewer line running 800-1000' terminating in wooden sump	pre 1964 - 1981	soil, groundwater
28	Drippage/ kickback area	Unlined area 100' x 400' SW of Process Bldg.	pre 1964 - 1986	soil, groundwater
29	Black Tie Yard	unlined storage areas for treated wood	pre 1964 - 1986	soil, groundwater
30, 31	Storm Runoff ditches	Unlined ditches which collect surface water runoff	pre 1964 - present	soil, groundwater
32	Process Wastewater sewers	Buried ceramic tile/concrete piping, part of WWTS	pre 1964 - 1986	soil, groundwater
B	Creosote Storage Area	Unlined area enclosed by concrete wall, contained 3 creosote storage tanks	pre 1964 - 1986	soil, groundwater

Attachment VI-3

RCRA Facility Investigation (RFI)
Work Plan Outline

RCRA FACILITY INVESTIGATION (RFI) WORK PLAN OUTLINE

I. RFI WORK PLAN REQUIREMENTS

The Permittee shall prepare a RCRA Facility Investigation (RFI) Work Plan that meets the requirements of Part II of this appendix and the RFI Guidance, EPA-530/SW-89-031. This Work Plan shall also include the development of the following plans, which shall be prepared concurrently:

A. Project Management Plan

Permittee shall prepare a Project Management Plan which will include a discussion of the technical approach, schedules and personnel. The Project Management Plan will also include a description of qualifications of personnel performing or directing the RFI, including contractor personnel. This plan shall also document the overall management approach to the RCRA Facility Investigation.

B. Sampling and Analysis Plan(s)

The Permittee shall prepare a plan to document all monitoring procedures: field sampling, sampling procedures and sample analysis performed during the investigation to characterize the environmental setting, source, and releases of hazardous constituents, so as to ensure that all information and data are valid and properly documented. The Sampling Strategy and Procedures shall be in accordance with EPA Region 4 Environmental Compliance Branch's Standard Operating Procedure and Quality Assurance Manual (SOP) (most recent version). Any deviations from this reference must be requested by the applicant and approved by EPA. The Sampling and Analysis Plan must specifically discuss the following unless the SOP procedures are specifically referenced.

1. Sampling Strategy

a. Selecting appropriate sampling locations, depths, etc.;
b. Obtaining all necessary ancillary data;
c. Determining conditions under which sampling should be conducted;
d. Determining which media are to be sampled (e.g., groundwater, air, soil, sediment, subsurface gas);
e. Determining which parameters are to be measured and where;
f. Selecting the frequency of sampling and length of sampling period;
g. Selecting the types of samples (e.g., composites vs. grabs) and number of samples to be collected.

2. Sampling Procedures

a. Documenting field sampling operations and procedures, including;

(1) Documentation of procedures for preparation of reagents or supplies which become an integral part of the sample (e.g., filters, preservatives, and absorbing reagents);
(2) Procedures and forms for recording the exact location and specific considerations associated with sample acquisition;
(3) Documentation of specific sample preservation method;
(4) Calibration of field instruments;
(5) Submission of field-biased blanks, where appropriate;
(6) Potential interferences present at the facility;
(7) Construction materials and techniques, associated with monitoring wells and piezometers;
(8) Field equipment listing and sampling containers;
(9) Sampling order; and
(10) Decontamination procedures.

b. Selecting appropriate sample containers;
c. Sampling preservation; and
d. Chain-of-custody, including:
(1) Standardized field tracking reporting forms to establish sample custody in the field prior to shipment; and

(2) Pre-prepared sample labels containing all information necessary for effective sample tracking.

3. Sample Analysis

Sample analysis shall be conducted in accordance with SW-846: "Test Methods for Evaluating Solid Waste - Physical/Chemical Methods" (most recent version). The sample analysis section of the Sampling and Analysis Plan shall specify the following:

a. Chain-of-custody procedures, including:

(1) Identification of a responsible party to act as sampling custodian at the laboratory facility authorized to sign for incoming field samples, obtain documents of shipment, and verify the data entered onto the sample custody records;
(2) Provision for a laboratory sample custody log consisting of

serially numbered standard lab-tracking report sheets; and

(3) Specification of laboratory sample custody procedures for sample handling, storage, and dispersement for analysis.

b. Sample storage;

c. Sample preparation methods;

d. Analytical Procedures, including:

(1) Scope and application of the procedure;
(2) Sample matrix;
(3) Potential interferences;
(4) Precision and accuracy of the methodology; and
(5) Method detection limits.

e. Calibration procedures and frequency;

f. Data reduction, validation and reporting;

g. Internal quality control checks, laboratory performance and systems audits and frequency, including:

(1) Method blank(s);
(2) Laboratory control sample(s);
(3) Calibration check sample(s);
(4) Replicate sample(s);
(5) Matrix-spiked sample(s);
(6) "Blind" quality control sample(s);
(7) Control charts;
(8) Surrogate samples;
(9) Zero and span gases; and
(10) Reagent quality control checks.

h. External quality control checks by EPA, including:

(1) Spikes and blanks at sampling events for which EPA or its technical representative provides oversight; and
(2) The equivalent of a CLP data package for samples split with EPA or for which EPA specifically requests the package.

i. Preventive maintenance procedures and schedules;

j. Corrective action (for laboratory problems); and

k. Turnaround time.

C. Data Management Plan

The Permittee shall develop and initiate a Data Management Plan to document and track investigation data and results. This plan shall identify and set up data documentation materials and procedures, project file requirements, and project-related progress reporting procedures and documents. The plan shall also provide the format to be used to present the raw data and conclusions of the investigation.

1. Data Record

The data record shall include the following:

a. Unique sample or field measurement code;
b. Sampling or field measurement location and sample or measurement type;
c. Sampling or field measurement raw data;
d. Laboratory analysis ID number;
e. Property or component measures; and
f. Result of analysis (e.g. concentration).

2. Tabular Displays

The following data shall be presented in tabular displays:

a. Unsorted (raw) data;
b. Results for each medium, or for each constituent monitored;
c. Data reduction for statistical analysis, as appropriate;
d. Sorting of data by potential stratification factors (e.g., location, soil layer, topography); and
e. Summary data

3. Graphical Displays

The following data shall be presented in graphical formats (e.g., bar graphs, line graphs, area or plan maps, isopleth plots, cross-sectional plots or transits, three dimensional graphs, etc.):

a. Display sampling location and sampling grid:
b. Indicate boundaries of sampling area, and area where more data are required;
c. Display geographical extent of contamination;
d. Illustrate changes in concentration in relation to distances from the source, time, depth or other parameters; and
e. Indicate features affecting inter-media transport and show potential

receptors.

II. RCRA Facility Investigation (RFI) Requirements

RCRA Facility Investigation:
The Permittee shall conduct those investigations necessary to: characterize the facility (Environmental Setting); define the source (Source Characterization); define the degree and extent of release of hazardous constituents (Contamination Characterization); and identify actual or potential receptors.

The investigations should result in data of adequate technical content and quality to support the development and evaluation of the corrective action plan if necessary. The information contained in previously developed documents such as a RCRA Part B permit application and/or RCRA Section 3019 Exposure Information Report may be referenced as appropriate, but must be summarized in both the RFI Work Plan and RFI Report.

All sampling and analyses shall be conducted in accordance with the Sampling and Analysis Plan. All sampling locations shall be documented in a log and identified on a detailed site map.

A. Environmental Setting

The Permittee shall collect information to supplement and/or verify Part B information on the environmental setting at the facility. The Permittee shall characterize the following as they relate to identified sources, pathways and areas of releases of hazardous constituents from Solid Waste Management Units.

1. Hydrogeology

The Permittee shall conduct a program to evaluate hydrogeologic conditions at the facility. This program shall provide the following information:

a. A description of the regional and facility specific geologic and hydrogeologic characteristics affecting ground-water flow beneath the facility, including:

(1) Regional and facility specific stratigraphy: description of strata including strike and dip, identification of stratigraphic contacts;
(2) Structural geology: description of local and regional structural features (e. g., folding, faulting, tilting, jointing, etc.);
(3) Depositional history;

(4) Regional and facility specific ground-water flow patterns; and
(5) Identification and characterization of areas and amounts of recharge and discharge.

b. An analysis of any topographic features that might influence the ground-water flow system.

c. Based on field data, tests, and cores, a representative and accurate classification and description of the hydrogeologic units which may be part of the migration pathways at the facility (i. e., the aquifers and any intervening saturated and unsaturated units), including:

(1) Hydraulic conductivity and porosity (total and effective);
(2) Lithology, grain size, sorting, degree of cementation;
(3) An interpretation of hydraulic interconnections between saturated zones; and
(4) The attenuation capacity and mechanisms of the natural earth materials (e. g., ion exchange capacity, organic carbon content, mineral content etc.).

d. Based on data obtained from groundwater monitoring wells and piezometers installed upgradient and downgradient of the potential contaminant source, a representative description of water level or fluid pressure monitoring including:

(1) Water-level contour and/or potentiometric maps;
(2) Hydrologic cross sections showing vertical gradients;
(3) The flow system, including the vertical and horizontal components of flow; and
(4) Any temporal changes in hydraulic gradients, for example, due to tidal or seasonal influences.

e. A description of man-made influences that may affect the hydrology of the site, identifying:

(1) Local water-supply and production wells with an approximate schedule of pumping; and
(2) Man-made hydraulic structures (pipelines, french drains, ditches, etc.).

2. Soils

The Permittee shall conduct a program to characterize the soil and rock units above the water table in the vicinity of contaminant release(s). Such characterization may

include, but not be limited to, the following types of information as appropriate:

a. Surface soil distribution;
b. Soil profile, including ASTM classification of soils;
c. Transects of soil stratigraphy;
d. Hydraulic conductivity (saturated and unsaturated);
e. Relative permeability;
f. Bulk density;
g. Porosity;
h. Soil sorption capacity;
i. Cation exchange capacity (CEC);
j. Soil organic content;
k. Soil pH;
l. Particle size distribution;
m. Depth of water table;
n. Moisture content;
o. Effect of stratification on unsaturated flow;
p. Infiltration;
q. Evapotranspiration;
r. Storage capacity;
s. Vertical flow rate; and
t. Mineral content.

3. Surface Water and Sediment

The Permittee shall conduct a program to characterize the surface water bodies in the vicinity of the facility. Such characterization may include, but not be limited to, the following activities and information:

a. Description of the temporal and permanent surface water bodies including:

(1) For lakes and estuaries: location, elevation, surface area, inflow, outflow, depth, temperature stratification, and volume;
(2) For impoundments: location, elevation, surface area, depth, volume, freeboard, and construction and purpose;
(3) For streams, ditches, and channels: location, elevation, flow, velocity, depth, width, seasonal fluctuations, flooding tendencies (i. e., 100 year event), discharge point(s), and general contents.
(4) Drainage patterns; and
(5) Evapotranspiration.

b. Description of the chemistry of the natural surface water and sediments. This includes determining the pH, total dissolved solids, total suspended solids, biological oxygen demand, alkalinity, conductivity, dissolved oxygen profiles, nutrients, chemical oxygen demand, total organic carbon, specific contaminant concentrations, etc.

c. Description of sediment characteristics including:

(1) Deposition area;
(2) Thickness profile; and
(3) Physical and chemical parameters (e. g., grain size, density, organic carbon content, ion exchange capacity, pH, etc.)

4. Air

The Permittee shall provide information characterizing the climate in the vicinity of the facility. Such information may include, but not be limited to:

a. A description of the following parameters:

(1) Annual and monthly rainfall averages;
(2) Monthly temperature averages and extremes;
(3) Wind speed and direction;
(4) Relative humidity/dew point;
(5) Atmospheric pressure;
(6) Evaporation data;
(7) Development of inversions; and
(8) Climate extremes that have been known to occur in the vicinity of the facility, including frequency of occurrence. (i. e. Hurricanes)

b. A description of topographic and man-made features which affect air flow and emission patterns, including:

(1) Ridges, hills or mountain areas;
(2) Canyons or valleys;
(3) Surface water bodies (e. g. rivers, lakes, bays, etc.); and
(4) Buildings.

B. Source Characterization

For those sources from which releases of hazardous constituents have been detected, the

Permittee shall collect analytical data to completely characterize the wastes and the areas where wastes have been placed, to the degree that is possible without undue safety risks, including: type, quantity; physical form; disposition (containment or nature of deposits); and facility characteristics affecting release (e. g., facility security, and engineering barriers). This shall include quantification of the following specific characteristics, at each source area:

1. Unit/Disposal Area Characteristics:

   a. Location of unit/disposal area;
   b. Type of unit/disposal area;
   c. Design features;
   d. Operating practices (past and present)
   e. Period of operation;
   f. Age of unit/disposal area;
   g. General physical conditions; and
   h. Method used to close the unit/disposal area.

2. Waste Characteristics:

   a. Type of wastes placed in the unit;

      (1) Hazardous classification (e. g., flammable, reactive, corrosive, oxidizing or reducing agent);
      (2) Quantity; and
      (3) Chemical composition.

   b. Physical and chemical characteristics such as;

      (1) Physical form (solid, liquid, gas);
      (2) Physical description (e. g., powder, oily sludge);
      (3) Temperature;
      (4) pH;
      (5) General chemical class (e. g., acid, base, solvent);
      (6) Molecular weight;
      (7) Density;
      (8) Boiling point;
      (9) Viscosity;
      (10) Solubility in water;
      (11) Cohesiveness of the waste; and
      (12) Vapor pressure.

   c. Migration and dispersal characteristics of the waste such as:

(1) Sorption capability;
(2) Biodegradability, bioconcentration, biotransformation;
(3) Photodegradation rates;
(4) Hydrolysis rates; and
(5) Chemical transformations.

The Permittee shall document the procedures used in making the above determinations.

C. Characterization of Releases of Hazardous Constituents

The Permittee shall collect analytical data on groundwater, soils, surface water, sediment, and subsurface gas contamination in the vicinity of the facility in accordance with the sampling and analysis plan as required above. These data shall be sufficient to define the extent, origin, direction, and rate of movement of contamination. Data shall include time and location of sampling, media sampled, concentrations found, conditions during sampling, and the identity of the individuals performing the sampling and analysis. The Permittee shall address the following types of contamination at the facility:

1. Groundwater Contamination

The Permittee shall conduct a groundwater investigation to characterize any plumes of contamination detected at the facility. This investigation shall at a minimum provide the following information:

a. A description of the horizontal and vertical extent of any plume(s) of hazardous constituents originating from within the facility;
b. The horizontal and vertical direction of contamination movement;
c. The velocity of contaminant movement;
d. The horizontal and vertical concentration profiles of hazardous constituents in the plume(s);
e. An evaluation of factors influencing the plume movement; and
f. An extrapolation of future contaminant movement.

The Permittee shall document the procedures used in making the above determinations (e. g., well design, well construction, geophysics, modeling, etc.).

2. Soil Contamination

The Permittee shall conduct an investigation to characterize the contamination of the soil and rock units above the saturated zone in the vicinity of any contaminant release. The investigation may include the following information:

a. A description of the vertical and horizontal extent of contamination;
b. A description of appropriate contaminant and soil chemical properties within the contaminant source area and plume. This may include contaminant solubility, speciation, absorption, leachability, exchange capacity, biodegradability, hydrolysis photolysis, oxidation and other factors that might affect contaminant migration and transformation;
c. Specific contaminant concentrations;
d. The velocity and direction of contaminant movement; and
e. An extrapolation of future contaminant movement.

The Permittee shall document the procedures used in making the above determinations.

3. Surface Water and Sediment Contamination

The Permittee shall conduct a surface water investigation to characterize contamination in surface water bodies resulting from releases of hazardous constituents at the facility. The investigation may include, but not be limited to, the following information:

a. A description of the horizontal and vertical extent of any plume(s) originating from the facility, and the extent of contamination in underlying sediments;
b. The horizontal and vertical direction of contaminant movement;
c. The contaminant velocity;
d. An evaluation of the physical, biological and chemical factors influencing contaminant movement;
e. An extrapolation of future contaminant, movement; and
f. A description of the chemistry of the contaminated surface waters and sediments. This includes determining the pH, total dissolved solids, specific contaminant concentrations, etc.

4. Air Contamination

The Permittee shall conduct an investigation to characterize gaseous releases of hazardous constituents into the atmosphere or any structures or buildings. This investigation may provide the following information:

a. A description of the horizontal and vertical direction and velocity of contaminant movement;
b. The rate and amount of the release; and
c. The chemical and physical composition of the contaminant(s) released, including horizontal and vertical concentration profiles.

The Permittee shall document the procedures used in making the above determinations.

D. Potential Receptors

The Permittee shall collect data describing the human populations and environmental systems that are susceptible to contaminant exposure from the facility. Chemical analysis of biological samples and/or data on observable effects in ecosystems may also be obtained as appropriate. The following characteristics shall be identified:

1. Current local uses and planned future uses of groundwater:

   a. Type of use (e. g., drinking water source: municipal or residential, agricultural, domestic/non-potable, and industrial); and
   b. Location of ground water users, to include withdrawal and discharge wells, within one mile of the impacted area.

   The above information should also indicate the aquifer or hydrogeologic unit used and/or impacted for each item.

2. Current local uses and planned future uses of surface waters directly impacted by the facility:

   a. Domestic and municipal (e. g., potable and lawn/gardening watering);
   b. Recreational (e. g. swimming, fishing);
   c. Agricultural;
   d. Industrial; and
   e. Environmental (e. g., fish and wildlife propagation).

3. Human use of or access to the facility and adjacent lands, including but not limited to:

   a. Recreation;
   b. Hunting;
   c. Residential;
   d. Commercial; and
   e. Relationship between population locations and prevailing wind direction.

4. A general description of the biota in surface water bodies on, adjacent to, or affected by the facility.
5. A general description of the ecology within the area adjacent to the facility.

6. A general demographic profile of the people who use have access to the facility and adjacent land, including, but not limited to: age; sex; and sensitive subgroups.
7. A description of any known or documented endangered or threatened species near the facility.

Attachment VI-4

Corrective Measures Study (CMS)
Outline

CORRECTIVE MEASURE STUDY (CMS) OUTLINE

The purpose of the CMS portion of the RCRA corrective action process is to identify and evaluate potential remedial alternatives for the releases of hazardous constituents that have been identified at the facility through the RFI or other investigations to need further evaluation. The scope and requirements of the CMS are balanced with the expeditious initiation of remedies and rapid restoration of contaminated media. The scope and requirements of the CMS should be focused to fit the complexity of the site-specific situation. It is anticipated that Permittee's with sites with complex environmental problems may need to evaluate a number of technologies and corrective measure alternatives. For other facilities, however, the evaluation of a single corrective measure alternative may be adequate. Therefore, a streamlined or focused approach to the CMS may be initiated. Information gathered during any stabilizations or interim measures will be used to augment the CMS and in cases where corrective action goals are met, may be a substitute for the final CMS.

Regardless of whether a streamlined/focused or a detailed CMS is required, a CMS Work Plan and CMS Report are generally required elements. The requirements for a full, detailed CMS are listed below. The Agency has the flexibility not to require sections of the plan and/or report, where site-specific situations indicate that all requirements are not necessary. Additionally, the Agency may require additional studies besides these discussed in order to support the CMS.

I. Corrective Measures Study (CMS) Work Plan

A. Elements of the CMS Work Plan

The Corrective Measures Study (CMS) Work Plan shall include at a minimum the following elements:

1. A site-specific description of the overall purpose of the CMS;
2. A description of the corrective measure objectives, including proposed target media cleanup standards (e.g., promulgated federal and state standards) and preliminary points of compliance or a description of how a risk assessment will be performed (e.g., guidance documents);
3. A description of the specific corrective measure technologies and/or corrective measure alternatives which will be studied;
4. A description of the general approach to investigating and evaluating potential corrective measures;
5. A detailed description of any proposed pilot, laboratory and/or bench scale studies;
6. A proposed outline for the CMS Report including a description of how information will be presented;

7. A description of overall project management including overall approach, levels of authority (include organization chart), lines of communication, project schedules, budget and personnel. Include a description of qualifications for personnel directing or performing the work;
8. A project schedule that specifies all significant steps in the process and when key documents (*e.g.*, CMS Progress Reports, draft CMS Report) are to be submitted to the Agency;
9. A detailed Public Involvement Plan.

II. Corrective Measures Study (CMS) Report

The detail of a CMS may vary based upon the complexity of the site, on-going Interim Measures, etc. However, the CMS Report may include the following elements:

A. Introduction/Purpose

The Permittee shall describe the purpose of the CMS Report and provide a summary description of the project.

B. Description of Current Situation

The Permittee shall submit a summary and an update to the information describing the current situation at the facility and the known nature and extent of the contamination as documented by the RCRA Facility Investigation (RFI) Report. This discussion should concentrate on those issues which could significantly affect the evaluation and selection of the corrective measures alternative(s). The Permittee shall provide an update to information presented in the RFI regarding previous response activities and interim measures which have or are being implemented at the facility. The Permittee shall also make a facility-specific statement of the purpose for the response, based on the results of the RFI. The statement of purpose should identify the actual or potential exposure pathways that should be addressed by corrective measures.

C. Establishment of Proposed Media Specific Cleanup Standards

The Permittee shall describe the proposed media cleanup standards and point of compliance. The standards must be either background, promulgated federal and state standards or risk-derived standards. If media clean-up standards are not proposed, then the Agency will unilaterally propose setting media clean-up standards to either background, promulgated federal and state standards or the most conservative risk-derived standards.

D. Identification, Screening and Development of Corrective Measure Technologies

1. Identification: List and briefly describe potentially applicable technologies

for each affected media that may be used to achieve the corrective action objectives. Include a table that summarizes the available technologies.

The Permittee should consider innovative treatment technologies, especially in situations where there are a limited number of applicable corrective measure technologies.

Screening: The Permittee shall screen the corrective measure technologies to eliminate those that may prove infeasible to implement, that rely on technologies unlikely to perform satisfactorily or reliably, or that do not achieve the corrective measure objective within a reasonable time period. This screening process focuses on eliminating those technologies which have severe limitations for a given set of waste and site-specific conditions. The screening step may also eliminate technologies based on inherent technology limitations.

Site, waste, and technology characteristics which are used to screen inapplicable technologies are described in more detail below:

a. Site Characteristics: Site data should be reviewed to identify conditions that may limit or promote the use of certain technologies. Technologies whose use is clearly precluded by site characteristics should be eliminated from further consideration.

b. Waste Characteristics: Identification of waste characteristics that limit the effectiveness or feasibility of technologies is an important part of the screening process. Technologies clearly limited by these waste characteristics should be eliminated from consideration. Waste characteristics particularly affect the feasibility of in-situ methods, direct treatment methods, and land disposal (on/off-site).

c. Technology Limitations: During the screening process, the level of technology development, performance record, and inherent construction, operation, and maintenance problems should be identified for each technology considered. Technologies that are unreliable, perform poorly, or are not fully demonstrated may be eliminated in the screening process. For example, certain treatment methods have been developed to a point where they can be implemented in the field without extensive technology transfer or development.

3. Corrective Measure Development: The Permittee shall assemble the technologies that pass the screening step into specific alternatives that have

the potential to meet the corrective action objectives for each media. Options for addressing less complex sites could be relatively straight-forward and may only require evaluation of a single or limited number of alternatives. Each alternative may consist of an individual technology or a combination used in sequence (i.e., treatment train). Different alternatives may be considered for separate areas of the facility, as appropriate. List and briefly describe each corrective measure alternative.

E. Evaluation of a Final Corrective Measure Alternative

For each remedy which warrants a more detailed evaluation (i.e., those that passed through the screening step), including those situations when only one remedy is being proposed, the Permittee shall provide detailed documentation of how the potential remedy will comply with each of the standards listed below. These standards reflect the major technical components of remedies including cleanup of releases, source control and management of wastes that are generated by remedial activities. The specific standards are as follows:

1. Protect human health and the environment.
2. Attain media cleanup standards set by EPA.
3. Control the source of releases so as to reduce or eliminate, to the extent practicable, further releases that may pose a threat to human health and the environment.
4. Comply with applicable standards for management of wastes.
5. Other factors.

In evaluating the selected alternative or alternatives, the Permittee shall prepare and submit information that documents that the specific remedy will meet the standards listed above. The following guidance should be used in completing this evaluation.

6. Protect Human Health and the Environment

Corrective action remedies must be protective of human health and the environment. Remedies may include those measures that are needed to be protective, but are not directly related to media cleanup, source control or management of wastes. An example would be a requirement to provide alternative drinking water supplies in order to prevent exposures to releases from an aquifer used for drinking water purposes. Therefore, the Permittee shall provide a discussion of any short term remedies necessary to meet this standard, as well as discuss how the corrective measures alternative(s) meet this standard.

7. Attain Media Cleanup Standards

Remedies will be required to attain media cleanup standards. As part of the

necessary information for satisfying this requirement, the Permittee shall address whether the potential remedy will achieve the remediation objectives. An estimate of the time frame necessary to achieve the goals shall be included. Contingent remedies may be proposed if there is doubt if the initial remedy will be successful (*e.g.*, contingent remedies to innovative technologies).

8. Control of Sources of Releases

The Permittee shall address the issue of whether source control measures are necessary, and if so, the type of actions that would be appropriate. Any source control measure proposed should include a discussion on how well the method is anticipated to work given the particular situation at the facility and the known track record of the specific technology.

9. Comply With any Applicable Standards for Management of Wastes

The Permittee shall include a discussion of how the specific waste management activities will be conducted in compliance with all applicable state and federal regulations (e.g., closure requirements, LDRs)

10. Other Factors

There are five general factors that will be considered as appropriate by EPA in selecting/approving a remedy that meets the four standards listed above. These five decision factors include:

a. Long-term reliability and effectiveness;
b. Reduction in the toxicity, mobility or volume of wastes;
c. Short-term effectiveness;
d. Implementability; and
e. Cost.

Examples of the type of information to include are provided below:

(1) Long-term reliability and effectiveness: The Permittee may consider whether the technology, or combination of technologies, have been used effectively under analogous site conditions, whether failure of any one technology in the alternative would have any immediate impact on receptors, and whether the alternative would have the flexibility to deal with uncontrollable changes at the site. Operation and maintenance requirements include the frequency and complexity of necessary operation and maintenance. In

addition, each corrective measure alternative should be evaluated in terms of the projected useful life of the overall alternative and of its component technologies. Useful life is defined as the length of time the level of effectiveness can be maintained.

(2) Reduction in the toxicity, mobility or volume of wastes: As a general goal, remedies will be preferred that employ techniques that are capable of eliminating or substantially reducing the potential for the wastes in SWMUs and/or contaminated media at the facility to cause future environmental releases. Estimates of how the corrective measure alternative will reduce toxicity, mobility and or volume of the waste is required and may be accomplished through a comparison of initial site conditions to expected post-corrective measures conditions.

(3) Short-term effectiveness: The Permittee shall evaluate each corrective measure alternative for short-term effectiveness. Possible factors to consider are fire, explosion, exposure to hazardous constituents and potential threats associated with the treatment, excavation, transportation and re-disposal or containment of the waste material.

(4) Implementability: Information to consider when assessing implementability include:

(a) The administrative activities needed to implement the corrective measure alternative (e.g. permits, rights of way, etc.) and the length of time these activities will take;
(b) The constructibility, time for implementation, and time for beneficial results;
(c) The availability of adequate off-site treatment, storage capacity, disposal services, needed technical services and materials; and
(d) The availability of prospective technologies for each corrective measure alternative.

(5) Cost: The Permittee shall develop an estimate of the cost of each corrective measure alternative (and for each phase or segment of the alternative). The cost estimate shall include both capital and operation and maintenance costs. The capital

costs shall include, but are not limited to, costs for: engineering, site preparation, construction, materials, labor, sampling/analysis, waste management/disposal, permitting, health and safety measures, etc. The operation and maintenance costs shall include labor, training, sampling and analysis, maintenance materials, utilities, waste disposal and/or treatment, etc. Costs shall be calculated as the net present value of the capital and operation and maintenance costs.

F. Justification and Recommendation of the Corrective Measure or Measures

The Permittee shall justify and recommend in the CMS Report a corrective measure alternative for consideration by the Agency. Such a recommendation should include a description and supporting rationale for the preferred alternative that is consistent with the corrective action standards and remedy selection decision factors discussed above. In addition, this recommendation shall include summary tables which allow the alternative or alternatives to be understood easily. Trade-offs among health risks, environmental effects, and other pertinent factors shall be highlighted. The Regional Administrator will select the corrective measure alternative or alternatives to be implemented based on the results presented in the CMS Report.

Attachment VI-5

Schedule of Compliance

Schedule of Compliance	Due Date
Renewal of Part B Application Permit Condition I.E.2.	180 days prior to expiration of the permit
Release reporting Permit Condition I.E.15.	• Orally within 24 hours of the Permittee becoming aware of the release • Written within 5 days of the Permittee becoming aware of the release
• Install additional compliance monitoring well • Submit Class 1 permit modification Permit Condition III.B.1.d.	• Within 90 days of receiving approval of facility RFI Work plan • Within 30 days of the installation of the monitoring well
Well abandonment methods and certification Permit Condition III.B.4.	Within 7 days from the date the wells are removed from the monitoring program
Determination of significant evidence of a release Permit Condition III.G.5.	Within 90 days of collecting required samples
Analytical results for samples collected: • January - June • July - December Permit Condition III.H.2.	• September 1 • March 1
Notice that significant evidence of a release has been detected Permit Condition III.H.3.a.	Within seven days of the determination
Application for a permit modification to establish a compliance monitoring program. Permit Condition III.H.3.d.	Within 90 days of making a determination of significant evidence of a release.
Notice of intent to demonstrate that evidence of a release was caused by error or a source other than the regulated unit. Permit Condition III.H.4.b.	Within 90 days of the determination of significant evidence of a release
Certification that the post-closure care for the regulated unit was performed in accordance with the specification in the approved Post-Closure Plan. Permit Condition IV.E.2.	Within 60 days after completion of the established post-closure care period.
Notification of Newly Identified SWMUs and AOCs Condition II.B.1. and Condition II.B.2.	Within fifteen (15) calendar days of discovery

Schedule of Compliance	Due Date
SWMU Assessment Report Condition II.B.3.	Within ninety (90) calendar days of notification
Notification for Newly Discovered Releases at Previously Identified SWMUs and AOCs Condition II.C.1.	Within fifteen (15) calendar days of discovery
Confirmatory Sampling Work Plan for SWMUs identified under Condition II.B.4.	Within forty-five (45) calendar days of notification by the Regional Administrator (RA)
Confirmatory Sampling Report Condition II.D.4.	In accordance with the approved CS Work Plan
RFI Work Plan for SWMU(s) and AOC(s) Identified under Condition II.B.4., Condition II.C.2., or Condition II.D.5.	Within one hundred-twenty (120) calendar days after receipt of notification by Regional Administrator (RA) which SWMUs or AOCs require an RFI
RFI Implementation Condition II.E.2.	At least ten (10) working days prior to any sampling activity
RFI Progress Reports Condition II.E.3.a.	Quarterly, beginning ninety (90) calendar days from the start date specified by the RA *
Draft RFI Report Condition II.E.3.b.	In accordance with the approved RFI Work Plan
Final RFI Report Condition II.E.3.b.	Within thirty (30) calendar days after receipt of RA's final comments on Draft RFI Report
Interim Measures Work Plan Condition II.F.1.a.	Within sixty (60) calendar days of notification by RA
Interim Measures Progress Reports Condition II.F.3.a.	In accordance with the approved Interim Measures Work Plan **
Interim Measures Report Condition II.F.3.b.	Within ninety (90) calendar days of completion

Schedule of Compliance	Due Date
CMS Work Plan Condition II.G.1.a.	Following RA approval of the final RFI Report and within ninety (90) calendar days of notification by RA that a CMS is required
Implementation of CMS Work Plan Condition II.G.2.	Within thirty (30) calendar days after receipt of RA approval of Plan
Draft CMS Report Condition II.G.3.a.	In accordance with the schedule in the approved CMS Work Plan
Final CMS Report Condition II.G.3.a.	Within thirty (30) calendar days of RA's final comments on Draft CMS Report
Demonstration of Financial Assurance Condition II.H.3.	Within one hundred twenty (120) calendar days after permit modification for remedy
Noncompliance/Imminent Hazard Report Condition I.D.14.	Oral within 24 hours and written within fifteen (15) calendar days of becoming aware of the hazardous circumstances
Waste Minimization Certification Part III	If Condition III.A. is applicable, annually from effective date of permit

The above reports must be signed and certified in accordance with 40 CFR §270.11.

* This applies to Work Plan execution that requires more than one hundred eighty (180) calendar days

** This applies to Work Plan execution that requires more than one year.

Attachment VI-6

Waste Minimization Objectives

Waste Minimization Certification Objectives

The Waste Minimization Program should include the following elements:

1. Top Management Support

- Dated and signed policy describing management support for waste minimization and for implementation of a waste minimization plan.

- Description of employee awareness and training programs designed to involve employees in waste minimization planning and implementation to the maximum extent feasible.

- Description of how a waste minimization plan has been incorporated into management practices so as to ensure ongoing efforts with respect to product design, capital planning, production operations, and maintenance.

2. Characterization of Waste Generation

- Identification of types, amounts, and hazardous constituents of waste streams, with the source and date of generation.

3. Periodic Waste Minimization Assessments

- Identification of all points in a process where materials can be prevented from becoming a waste, or can be recycled.

- Identification of potential waste reduction and recycling techniques applicable to each waste, with a cost estimate for capital investment and implementation.

- Description of technically and economically practical waste reduction/recycling options to be implemented, and a planned schedule for implementation.

- Specific performance goals, preferably quantitative, for the source reduction of waste by stream. Whenever possible, goals should be stated as weight of waste generated per standard unit of production, as defined by the generator.

4. Cost Allocation System

- Identification of waste management costs for each waste, factoring in liability,

transportation, recordkeeping, personnel, pollution control, treatment, disposal, compliance and oversight costs to the extent feasible.

- Description of how departments are held accountable for the wastes they generate.
- Comparison of waste management costs with costs of potential reduction and recycling techniques applicable to each waste.

5. Technology Transfer

- Description of efforts to seek and exchange technical information on waste minimization from other parts of the company, other firms, trade associations, technical assistance programs, and professional consultants.

6. Program Evaluation

- Description of types and amounts of hazardous waste reduced or recycled.
- Analysis and quantification of progress made relative to each performance goal established and each reduction technique to be implemented.
- Amendments to waste minimization plan and explanation.
- Explanation and documentation of reduction efforts completed or in progress before development of the waste minimization plan.
- Explanation and documentation regarding impediments to hazardous waste reduction specific to the individual facility.

References:

"Draft Guidance to Hazardous Waste Generators on the Elements of a Waste Minimization Program", 54 FR 25056, June 12, 1989.

"Waste Minimization Opportunity Assessment Manual", EPA/625/7-88/003, July 1988.

November 18, 1987, Effective December 18, 1987; 52 FR 45798, December 1, 1987; 52 FR 46963, December 10, 1987, Effective January 11, 1988; 53 FR 7740, March 10, 1988; 53 FR 27164, July 19, 1988; 53 FR 31211, August 17, 1988; 53 FR 34086, September 2, 1988; 53 FR 39728, October 11, 1988; 54 FR 26198, June 22, 1989; 54 FR 26647, June 23, 1989; 54 FR 33393, August 14, 1989; 55 FR 11798, March 29, 1990, Effective September 25, 1990, 55 FR 19262, May 9, 1990; 55 FR 22520, June 1, 1990; 55 FR 25454, June 21, 1990, Effective December 21, 1990; 55 FR 25978, June 26, 1990; 55 FR 26986, June 29, 1990, Effective September 25, 1990; 55 FR 31387, August 2, 1990; 55 FR 32733, August 10, 1990; 55 FR 39409, September 27, 1990, Effective September 25, 1990; 56 FR 7134, February 21, 1991, Effective August 21, 1991; 56 FR 19290, April 26, 1991, Effective December 21, 1990; 56 FR 32688, July 17, 1991, Effective August 21, 1991; 56 FR 30200, July 1, 1991; 57 FR 3486, January 29, 1992, Effective July 29, 1992; 57 FR 8088, March 6, 1992; 53 FR 37934, September 28, 1988; 57 FR 37262, August 18, 1992, Effective February 18, 1993; 57 FR 38564, August 25, 1992, Effective August 11, 1992; 57 FR 39275, August 28, 1992; 57 FR 41173, September 9, 1992; 57 FR 42835, September 16, 1992; 57 FR 54452, November 18, 1992, Effective May 18, 1993; 55 FR 50482, December 6, 1990, Effective January 1, 1994; 56 FR 30195, July 1, 1991, Effective January 1, 1994; 57 FR 61502, December 24, 1992, Effective January 1, 1994; 58 FR 8682, February 16, 1993, Effective April 19, 1993; 58 FR 26424, May 3, 1993, Effective March 8, 1993; 58 FR 29884, May 24, 1993, Effective May 10, 1993; 58 FR 46049, August 31, 1993; 59 FR 13891, March 24, 1994; 59 FR 29959, June 10, 1994, Effective August 9, 1994; 59 FR 48041, September 19, 1994; 59 FR 62926, December 6, 1994, Effective June 5, 1995; 60 FR 25540, May 11, 1995; 60 FR 26828, May 19, 1995, Effective December 6, 1995; 60 FR 35452, July 7, 1995; 60 FR 35705, July 11, 1995, Effective September 11, 1995; 60 FR 50428, September 29, 1995, Effective December 6, 1995; 61 FR 4911, February 9, 1996, Effective June 6, 1996; 61 FR 16309, April 12, 1996, Effective July 11,1996; 61 FR 59950, November 25, 1996; 62 FR 6650, February 12, 1997, Effective August 12, 1997; 62 FR 32462, June 13, 1997; 62 FR 64656, December 8, 1997),and all conditions of any additional siting requirements stated in this part.

Part 264.S1 - Annual Reporting

The owner or operator of any facility for the treatment, storage, recycling, or disposal of hazardous waste shall report by March 1 of each calendar year to the Department, on forms provided by the Department, the types and amounts of hazardous waste treated, stored, recycled, and/or disposed during the preceding calendar year.

Part 264.S2 - Location Standards for the Establishment or Expansion