STATE OF ARKANSAS

ARKANSAS DEPARTMENT OF ENVIRONMENTAL QUALITY

FINAL

RCRA HAZARDOUS WASTE PERMIT 31H-RN1

AUSTIN POWDER COMPANY AND HIGHLAND INDUSTRIAL PARK, INC.

Calhoun County, Arkansas

June 2015

RENEWAL PERMIT SIGN-OFF SHEET

Permittees:	Austin Powder Company & Highland Industrial Park
Operator:	Austin Powder Company
Owner:	Highland Industrial Park
Facility Location:	7-LC010 Blandy Road, East Camden, Calhoun County, AR
EPA I.D. Number:	ARD093417525
AFIN:	07-00032
Permit Number:	31H-RN1

Pursuant to the Federal Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976 (RCRA), as amended (42 USC 6901 et seq.) The Hazardous and Solid Waste Amendments of 1984 (HSWA), the Arkansas Hazardous Waste Management Act (A. C. A. §8-7-201 et seq.), as amended, the Arkansas Remedial Action Trust Fund Act (A.C.A. §8-7-501 et seq.), as amended, and the Arkansas Pollution Control and Ecology Commission (APC&EC) Regulation No. 23, a Renewal Permit is issued by the Arkansas Department of Environmental Quality (ADEQ) to Austin Powder Company & Highland Industrial Park, Inc. (Permittee), to operate a hazardous waste management facility located in East Camden, Calhoun County, Arkansas. APC&EC Regulation No. 23, as adopted June 22, 2012, and effective August 12, 2012, has incorporated verbatim all applicable hazardous waste federal regulations formerly cited in permits by "40 CFR" part number but now cited by the equivalent APC&EC Regulation No. 23 section number, unless specifically noted otherwise.

The Permittee's location is summarily described as follows:

> 7-LC010 Blandy Road, Highland Industrial Park, Latitude: 33 degrees 34 minutes 52.76 seconds North, Longitude: 92 degrees 35 minutes 22.82 seconds West.

The Permittee shall comply with all terms and conditions of this Renewal Permit. This Renewal Permit consists of the conditions contained in APC&EC Regulation No. 23, Sections 260 through 266, 268, and 270 and 40 CFR Part 124, as specified in the Renewal Permit. Applicable regulations are those which are in effect on the date of issuance of the Renewal Permit, in accordance with APC&EC Regulation No. 23 §270.32(c). Nothing contained herein shall negate the Permittee's duty to comply with the regulations and this Renewal Permit, or ADEQ's ability to enforce the regulations and this Renewal Permit. This Renewal Permit is based on the information submitted in the RCRA Part A and Part B Application, dated March 14, 2015, (hereafter referred to as the Renewal Permit Application), is accurate, and the facility will be operated as specified in the Renewal Permit Application and this Renewal Permit.

Any inaccuracies found in the submitted information may be grounds for the termination, revocation, and reissuance, or modification of this Renewal Permit in accordance with APC&EC Regulation No. 23 §270.41 and §270.43 and for enforcement action. The Permittee shall inform ADEQ of any deviation from or changes in the information in the Renewal Permit Application which would affect the Permittee's ability to comply with the applicable regulations or Permit conditions.

The Director reserves the right to amend or add conditions to this Renewal Permit, as necessary to be protective of human health and the environment.

This Renewal Permit, which incorporates Modules I, II, XI, XII(b), and XIV as conditions herein, shall be effective on service of notice of the Renewal Permit decision, as specified in APC&EC Regulation No. 8 (Administrative Procedures), Part 2, Section 2.1.10(b), and shall remain in effect for a period of ten (10) years from the effective date unless revoked and reissued under APC&EC Regulation No. 23 §270.41, terminated under APC&EC Regulation No. 23 §270.43, continued in accordance with APC&EC Regulation No. 23 §270.51(a) and §270.51(d) or modified under APC&EC Regulation No. 23 §270.41.

For the purposes of resolving conflicts between requirements to which the Permittee is subject, the following hierarchy and order of authority will govern in the Permittee's duty to comply: Regulations promulgated under APC&EC Regulation No. 23; General Permit Conditions (Module I); General Facility Conditions (Module II); Groundwater Compliance Monitoring (Module XI); Conditions/standards specific to activity (Modules XII(b) and XIV) and Part B Permit Renewal Application.

Instructions:

Attach this Permit Renewal Sign-Off Sheet to the front of Permit 31H-RN1.

Issued this 10th Day of June, 2015

Tammie J. Hynum, Chief
Hazardous Waste Division
Arkansas Department of Environmental Quality

Right to Adjudicatory Hearing:

This final permitting decision may be appealed by filing a written Request for Commission Review and Adjudicatory Hearing with the Secretary of the Commission within thirty (30) calendar days of the Certificate of Service (mailing) below (as stipulated in APC&EC Regulation 8, Section 2.1.14). If you want to appeal this matter, your appeal must be filed in accordance with Arkansas Pollution Control & Ecology Commission's (APC&EC or Commission) Regulation No. 8, available at www.adeq.state.ar.us. If you have any questions regarding the appeal procedure, please contact your attorney. All appeal procedures must be filed with the Commission's Secretary who is located at 101 E. Capitol, Suite 205, Little Rock, AR 72201. For directions to the Commission's office, call (501) 682-7893.

ADEQ's decision to approve this RCRA Permit Renewal to permit 31H-RN1 is final for purposes of appeal as of the date indicated in the Certificate of Service (mailing) below:

I, Kelli Johnson, hereby certify that a copy of this Notice of Decision has been mailed by first class mail to Mr. Gerald Stewart, Environmental Engineer, P.O. Box 317, McArthur, OH 45651, on or before this 11th day of June, 2015.

Kelli Johnson
Signature of person mailing this notice

PERMIT SUMMARY SHEET

AUSTIN POWDER COMPANY AND HIGHLAND INDUSTRIAL PARK
RESOURCE CONSERVATION AND RECOVERY ACT (RCRA)
HAZARDOUS WASTE MANAGEMENT FACILITY

PERMIT ORGANIZATION

This RCRA Permit 31H-RN1 is divided into the following sections:

1. A permit sign-off cover sheet setting forth the basic legal authority for issuing the permit.
2. Modules I and II containing general permit and facility conditions which must be met by all hazardous waste management facilities.
3. Modules XI, XII(b), and XIV containing specific permit conditions applicable to Austin Powder Company.

FACILITY DESCRIPTION

Austin Powder Company leases portions of the Highland Industrial Park, Inc. and is near the city of East Camden in Calhoun County, Arkansas. Austin Powder manufactures TNT-based cast boosters.

SUMMARY OF PERMIT OPERATIONS

This permit is for operation of an open burning (OB) unit and a groundwater compliance monitoring system. The OB unit consists of three (3) bum cages which bum energetic wastes and explosive-contaminated material generated from the manufacture of explosive booster charges at the facility. The groundwater monitoring system is for compliance monitoring of hazardous substances released from Solid Waste Management Units (SWMUs).

HSWA CORRECTIVE ACTION

The Hazardous and Solid Waste Amendments of 1984 (HSWA) requires the Austin Powder Company to investigate releases from Solid Waste Management Units (SWMUs) and to implement a corrective action program for releases of hazardous constituents if such have occurred. Six SWMUs have been identified at the Austin Powder Company facility for investigation and possible remediation.

The permit includes Module XII(b) which lists the SWMUs identified, details the investigating and reporting requirements, and provides corrective action processes for remediation of any releases of hazard constituents from SWMUs if determined necessary for the protection of public health and the environment. Module XI of the permit covers the groundwater compliance monitoring system.

SUMMARY OF THE PERMIT CONDITIONS

Module I - General Permit Conditions

Module I sets forth the standard procedural conditions that are applicable to all hazardous waste management facilities. The justification for these proposed permit conditions can be found in APC&EC Regulation No. 23 §270.30.

Module II- General Facility Conditions

Module II sets forth the general facility conditions applicable to all storage, treatment, incineration, and land disposal facilities. The regulatory basis for these conditions can be found in APC&EC Regulation No. 23, Section 264, Subsections A through E, G, and H.

Module XI- Ground Water Compliance Monitoring

Module XI sets forth the conditions applicable to ground water compliance monitoring system. The regulatory basis for these conditions can be found in APC&EC Regulation No. 23, Section 264, Subsections F and X.

Module XII(b)- Special Conditions for Corrective Action Related to Solid Waste Management Units

Module XII(b) contains conditions applicable to the corrective action of Solid Waste Management Units (SWMUs)(past or present) at the Austin Powder Company Facility.

Module XII(b) is issued as a specific condition of Austin Powder Company obtaining an operating permit for hazardous waste management. The regulatory basis for these conditions is contained in APC&EC Regulation No. 23, Section 264, Subsections F and H, and APC&EC Regulation No. 23, Section 270.

Module XIV- Treatment of Energetic Wastes

Module XIV contains conditions applicable to the treatment of energetic wastes. This Module requires the facility to conduct an environmental assessment for the Thermal Treatment Unit. This module also includes a compliance schedule (see Module XIV, Section I). The regulatory basis for these conditions is contained in APC&EC Regulation No. 23, Section 264, Subsection X. The regulatory basis for these conditions can be found in APC&EC Regulation No. 23, Section 264, Subsection X.

End of Permit Summary Sheet

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MODULE I- GENERAL PERMIT CONDITIONS

A. EFFECT OF PERMIT

The Permittee is allowed to open burn (OB) hazardous waste in accordance with the conditions of this Permit. Any storage/treatment/disposal of hazardous waste which requires a permit and which is not specifically authorized in this Permit is prohibited. Subject to APC&EC Regulation No. 23 §270.4, compliance with this Permit generally constitutes compliance, for purposes of enforcement, with Subtitle C of RCRA as amended, the Arkansas Remedial Action Trust Fund Act (A.C.A. §8-7-501), as amended, and the Arkansas Hazardous Waste Management Act (A.C.A. §8-7-201 *et seq*.), as amended. Issuance of a RCRA permit consists of a permit issued by ADEQ which addresses the provisions of the RCRA program and the Hazardous and Solid Waste Amendments of 1984 (HSWA) for which ADEQ is authorized by EPA for the administration of the programs.

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, or any infringement of state or local law or regulations. 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), as amended, the Arkansas Hazardous Waste Management Act (A.C.A. §8-7-201 *et seq.*), as amended, or any other law providing for protection of public health or the environment. [APC&EC Regulation No. 23 §270.4(b) and (c); §270.30(g)]

B. PERMIT ACTIONS

1. Permit Modification, Revocation and Reissuance, and Termination

   This Permit may be modified, revoked and reissued, or terminated for cause, as specified in APC&EC Regulation No. 23 §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. [APC&EC Regulation No. 23 §270.30(f)]

2. Permit Renewal

   This Permit may be renewed as specified in APC&EC Regulation No. 23 §270.30(b) and Permit Module I, Condition 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. [APC&EC Regulation No. 23 §270.30(b)]

3. Fees and Costs

   a. Permit Application: Any person who applies for a permit for the construction, operation, or post closure care of a hazardous waste

management facility or unit shall submit as part of said application a money order or cashier's check payable to the ADEQ to cover permit fees in accordance with the APC&EC Regulation No. 23 §6(a).

b. Permit Modification Applications: All permit modification applications other than Class 1 Modifications as defined at APC&EC Regulation No. 23 § 270.42, must be accompanied by a money order or cashier's check payable to the ADEQ. The fee shall be 50% of the base permit application fee as set forth APC&EC Regulation No. 23 §6(a). If additional waste management activities are applied for or operating capacities increased, an additional waste management fee shall be calculated from APC&EC Regulation No. 23 §6(b) and added to the modification fee total. [APC&EC Regulation No. 23 §6(e)]

c. Annual Permit Maintenance Fee: Any person who holds a permit for the construction, operation, or post closure care of a hazardous waste management facility or unit shall submit annually no later than the effective date of this permit a money order or cashier's check payable to the ADEQ to cover annual permit maintenance fees in accordance with the APC&EC Regulation No. 23 §6(a).

d. Annual Monitoring/Inspection Fee: All treatment, storage, and disposal facilities shall submit annually a money order or cashier's check payable to the ADEQ to cover applicable monitoring and inspection fees in accordance with APC&EC Regulation No. 23 §6(n) and add any applicable inspection and monitoring fees for generators of hazardous waste in accordance with APC&EC Regulation No. 23 §6(o) to (q) into the total by January 1 of every year.

e. Annual Fees on the Generation of Hazardous Waste: Every person who generates hazardous waste shall submit annually a money order or cashier's check payable to the ADEQ to cover the applicable fee according to APC&EC Regulation No. 23 §6(aa)(l)(ii) by July 1 of every year.

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. [40 CFR 124.16(a) and APC&EC Regulation No. 23§3(b)]

D. DEFINITIONS

For purposes of this Permit, terms used herein shall have the same meaning as those in APC&EC Regulation No. 23 Sections 260.10 and 270.2, 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. "Director" means the Director of ADEQ or designee or authorized representative. The Director, or designee, of ADEQ is the authorized representative for all permit condition enforcement, reports,

notifications, and other submission requirements.

E. DUTIES AND REQUIREMENTS

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 RCRA and is grounds for enforcement action; for Permit termination, revocation and reissuance, or modification; or for denial of a Permit renewal application. [APC&EC Regulation No. 23 §270.30(a)]

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 one hundred eighty (180) calendar days prior to permit expiration. [APC&EC Regulation No. 23 §§270.10(h) and 270.30(b)]

3. Permit Expiration

This Permit shall be effective for a fixed term not to exceed ten years. 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 APC&EC Regulation No. 23 §270.10, and §270.13 through §270.28) and, through no fault of the Permittee, the Director or designee has not issued a new permit. [APC&EC Regulation No. 23 §§270.50 and 270.51]

4. 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. [APC&EC Regulation No. 23 §270.30(c)]

5. 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. [APC&EC Regulation No. 23 §270.30(d)]

6. 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. [APC&EC Regulation No. 23 §270.30(e)]

7. Duty to Provide Information

The Permittee shall furnish to the Director or designee, within a reasonable time, any relevant information which the Director or designee may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Permit, or to determine compliance with this Permit. This requirement to maintain and make available (at the facility) all records as necessary to comply with the conditions of this Permit shall apply to contractors and sub-contractors of the Permittee. The Permittee shall also furnish to the Director or designee, upon request, copies of records required to be kept by this Permit. [APC&EC Regulation No. 23 §§264.74(a) and 270.30(h)]

8. Inspection and Entry

The Permittee shall allow the Director, designee, or an authorized representative, upon the presentation of credentials and other documents, as may be required by law, to: [APC&EC Regulation No. 23 §270.30(i)]

a. Enter at reasonable times upon the Permittee's premises where a regulated facility or activity is located or conducted, or where records shall be kept under the conditions of this Permit;

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

c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Permit including all corrective action work; and

d. Sample or monitor, at reasonable times, for the purposes of assuring Permit compliance or as otherwise authorized by RCRA or HSWA and A.C.A. §8-7-209(a)(7), any substances or parameters at any location.

9. Monitoring and Records

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 shall be the appropriate method from Appendix I of APC&EC Regulation No. 23, Section 261, or an equivalent method approved by the Director or designee. Laboratory methods shall be those specified in Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846, as revised; 40 CFR Part 136- Guidelines Establishing Test Procedures for the Analysis of Pollutants; RCRA Ground-Water Monitoring Technical Enforcement Guidance Document, 1986; OSWER Directive 9950.1; or an equivalent method, as specified in the Waste Analysis Plan, Section C of the Part B Application, and as approved by the Director or designee. [APC&EC Regulation No. 23 §270.30(j)(1)]

b. The Permittee shall retain records of all monitoring information, copies of all reports and records required by this Permit, the certification required by APC&EC Regulation No. 23 §264.73(b)(9), and records of all data used to

complete the application for this Permit until approved closure of the facility. [APC&EC Regulation No. 23 §270.30(j)(2)]

c. Records of monitoring information shall specify: [APC&EC Regulation No. 23 §270.30(j)(3)]

i. The date(s), exact place, and time(s) of sampling or measurement(s);

ii. The individual(s) who performed the sampling or measurements;

iii. The date(s) analyses were performed;

iv. The individual(s) who performed the analyses;

v. The analytical technique(s) or method(s) used; and

vi. The results of such analyses.

10. Reporting Planned Changes

The Permittee shall give notice to the Director or designee as soon as possible, of any planned physical alterations or additions to the Permitted facility. [APC&EC Regulation No. 23 §270.30(1)(1)]

11. Reporting Anticipated Noncompliance

The Permittee shall give advance notice to the Director or designee of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. [APC&EC Regulation No. 23 §270.30(1)(2)]

12. Certification of Construction or Modification

The Permittee may not commence, after the effective date of this Permit, to open burn hazardous waste at any newly constructed units or in any modified portion of the facility until the Permittee has submitted to the Director or designee, by certified mail or hand delivery, a letter signed by the Permittee and an Arkansas Registered Professional Engineer stating that the facility has been constructed or modified in compliance with this Permit [APC&EC Regulation No. 23 §270.30(1)(2)(i)]; and

a. The Director or designee has inspected the modified or newly constructed facility and finds it is in compliance with the conditions of the Permit; or

b. The Director or designee has either waived the inspection or has not within fifteen (15) calendar days notified The Permittee of his intent to inspect. [APC&EC Regulation No. 23 §270.30(1)(2)(ii)(B)]

13. Transfer of Permits

a. This Permit is not transferable to any person, except after notice to the Director or designee. The Director or designee may require modification or revocation and reissuance of the Permit pursuant to APC&EC Regulation No. 23 §270.40. [APC&EC Regulation No. 23 §270.30(1)(3)]

b. Changes in the ownership or operational control of the Permittee may be

made as a Class 1 modification with prior written approval of the Director or designee in accordance with APC&EC Regulation No. 23 §§270.42 and 270.30(1)(3). A written agreement containing a specific date for transfer of permit responsibility between the current and new permittees shall be submitted to the Director or designee. The Permittee shall be responsible for the requirements of APC&EC Regulation No. 23 Section 264, Subsection H until the new owner or operator has demonstrated that he or she is complying with the requirements of Subsection H. The Director or designee will notify the Permittee that the Permittee is no longer responsible for Subsection H requirements when the new owner or operator has demonstrated compliance with Subsection H requirements. 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 APC&EC Regulation No. 23, Sections 264 and 270 and this Permit. [APC&EC Regulation No. 23 §270.30(1)(3) and §264.12(c)]

The Permittee shall also meet the additional requirements of Sections §§270.7(g) and 270.10(l) of APC&EC Regulation No. 23 regarding ownership change and new partial owners.

14. Twenty-Four Hour Reporting

a. The Permittee shall report to the Director or designee any noncompliance which may endanger human 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: [APC&EC Regulation No. 23 §270.30(l)(6)(i)]

i. Information concerning release of any hazardous waste that may cause an endangerment to public drinking water supplies.

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.

b. The description of the occurrence and its cause shall include: [APC&EC Regulation No. 23 §270.30(l)(6)(ii)]

i. Name, address, and telephone number of the owner or operator;

ii. Name, address, and telephone number of the facility;

iii. Date, time, and type of incident;

iv. Name and quantity of materials involved; (5) The extent of injuries, if any;

v. An assessment of actual or potential hazards to the environment and human health outside the facility, where this is applicable; and

vi. Estimated quantity and disposition of recovered material that

resulted from the incident.

c. A written submission shall also be provided within five (5) calendar 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 or designee may waive the five (5) calendar day written notice requirement in favor of a written report within fifteen (15) calendar days. [APC&EC Regulation No. 23 §270.30(1)(6)(iii)]

15. Other Noncompliance

The Permittee shall report all other instances of noncompliance not otherwise required to be reported above in Permit Module I, Conditions E.10 - E.14, at the time monitoring reports are submitted. The reports shall contain the information listed in Permit Module I, Condition E.14. [APC&EC Regulation No. 23 §270.30(1)(10)]

16. Other Information

Whenever the Permittee becomes aware that it failed to submit any relevant facts in the Part B Application, or submitted incorrect information in a permit application, or in any report to the Director or designee, the Permittee shall promptly submit such facts or information. [APC&EC Regulation No. 23 §270.30(1)(11)]

17. Request for Additional Authority

The Permittee may, if appropriate, request implementation of ADEQ's authority pursuant to the Remedial Action Trust Fund Act of 1985, as amended, for purposes of implementing remedial activities and for entitlement to rights of contribution.

F. SIGNATORY REQUIREMENT

All applications, reports, or information submitted to or requested by the Director or designee, or authorized representative, shall be signed and certified in accordance with APC&EC Regulation No. 23 §§270.11 and 270.30(k).

G. REPORTS, NOTIFICATIONS, AND SUBMISSIONS TO THE DIRECTOR

All reports, notifications, or other submissions which are required by this Permit to be sent or hand-delivered to the Director or designee should be sent by certified mail or hand-delivered to:

Senior Manager, Regulated Waste Operations
Office of Land Resources
Arkansas Department of Environmental Quality
5301 Northshore Drive
North Little Rock, AR 72118-5317

H. CONFIDENTIAL INFORMATION

The Permittee may claim confidential any trade secrets required to be submitted by this Permit. The Director or designee shall determine which records are confidential. Any record not deemed confidential shall be marked "REJECTED" and promptly returned to the person submitting such information. [APC&EC Regulation No. 23 §270.12]

I. DOCUMENTS TO BE MAINTAINED AT THE FACILITY

The Permittee shall maintain at the facility, until closure is completed and certified by an independent, Arkansas Registered Professional Engineer and has been reviewed and approved by the ADEQ, the following documents and all amendments, revisions, and modifications to these documents:

1. Waste Analysis Plan, as required by APC&EC Regulation No. 23 §264.13 and this Permit;
2. Inspection schedules, as required by APC&EC Regulation No. 23 §264.15(b)(2) and this Permit;
3. Personnel training documents and records, as required by APC&EC Regulation No. 23 §264.16(d) and (e) and this Permit;
4. Contingency Plan, as required by APC&EC Regulation No. 23 §264.53(a) and this Permit;
5. Operating record, as required by APC&EC Regulation No. 23 §264.73 and of this Permit including but not limited to Module II, L.1;
6. Closure Plan, as required by APC&EC Regulation No. 23 §264.112(a) and this Permit;
7. Annually-adjusted cost estimate for facility closure, as required by APC&EC Regulation No. 23 §264.142(d) and this Permit;
8. Post-Closure Plan, as required by APC&EC Regulation No. 23 §264.118(a) and this Permit;
9. Annually-adjusted cost estimate for closure and post-closure, as required by APC&EC Regulation No. 23 §264.144(d) and this Permit;
10. Arkansas Registered Professional Engineer certified "as built" drawings and specifications for the facility's regulated constructed units, as regulated under this Permit and required by APC&EC Regulation No. 23 §270.30(1)(2)(i);
11. All corrective action documents developed as a requirement of Module XII(b) or alternative corrective action procedure or authority;
12. Arkansas Registered Professional Engineer certified "as built" drawings for all corrective measures facilities including, but not limited to, monitoring well locations, closure facilities, et cetera, developed as a requirement of Module XII(b). Monitoring wells must be drilled by a driller licensed by the Arkansas Commission on Water Well Construction and the boring logs from the monitoring wells must be certified by a professional geologist registered to practice geology in the State of Arkansas;

13. A facility map which is kept current (semi-annual) showing all regulated units and HSWA Solid Waste Management Units (SWMUs) and the status of all RCRA units (operating, post-closure etc.) and HSWA corrective action work;

14. All other documents required by Permit Module I, Condition E.9, and all other applicable required information; and

15. Documentation of the attempt to provide written arrangements to familiarize police, fire departments, and emergency response teams with the layout of the facility, properties of the hazardous waste handled at the facility and associated hazards, places where facility personnel would normally be working, entrances to and roads inside the facility, and possible evacuation routes as required by APC&EC Regulation No. 23 §264.37.

End of Module I

MODULE II- GENERAL FACILITY CONDITIONS

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, sediment, surface water, or groundwater which could threaten human health or the environment. [APC&EC Regulation No. 23 §264.31]

B. RECEIPT OF HAZARDOUS WASTE

The Permittee may not receive hazardous waste from off-site sources, with exception of the Austin Powder Manufacturing Plant located in Highland Industrial Park (HIP).

C. GENERAL WASTE ANALYSIS

The Permittee shall follow the waste analysis procedures required by APC&EC Regulation No. 23 §264.13, as well as those described in the Waste Analysis Plan, Section C of the Part B Application.

The Permittee shall verify the analysis of each waste stream annually as part of its quality assurance program, in accordance with *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*, EPA Publication SW-846, or equivalent methods approved by the Director or designee (See Permit Module I, Condition E.9., Duties and Requirements).

At a minimum, the Permittee shall maintain proper functional instruments, use approved sampling and analytical methods, verify the validity of sampling and analytical procedures, and perform correct calculations. If the permittee uses a contract laboratory to perform analyses, then the Permittee shall inform the laboratory in writing that it shall operate under the waste analysis conditions set forth in this Permit. Any contract laboratory used must be certified by ADEQ pursuant to A.C.A. § 8-2-201.

D. SECURITY

The Permittee shall comply with the security requirements of APC&EC Regulation No. 23 §264.14(b) and §264.14(c) and Section F of the Part B Application.

E. GENERAL INSPECTION REQUIREMENTS

1. The Permittee shall submit within thirty (30) calendar days of the effective date of this Permit to the ADEQ a revised Daily Report Form which meets the requirements of APC&EC Regulation No. 23 §264.15(d), including but not limited to: [APC&EC Regulation No. 23 §264.15]

    a. The date and time of the inspection;

    b. The name of the inspector;

    c. A notation of the observations; and

    d. The date and nature of any repairs or other remedial actions.

    If the Permittee chooses to use a computer program/database to retain all their required documentation, that program/database must include, at a minimum, all

the requirements found in APC&EC Regulation No. 23 §264.15(d).

[Completed]

2. The Permittee shall submit within thirty (30) calendar days of the effective date of this Permit to the ADEQ a revised schedule for inspecting monitoring equipment, safety and emergency equipment, security devices, and operating and structural equipment that meets the requirements of APC&EC Regulation No. 23 §264.15(b).

[Completed]

3. The Permittee shall inspect OB units prior to each use; and shall follow the inspection schedule set out in Section F of the Part B Application (At least weekly).

4. The Permittee shall **IMMEDIATELY** upon discovery of any deterioration, damage from use, or malfunction of an OB unit take such unit out of service by means of a Lock Out Tag Out (LOTO) procedure and the following:

   a. Where a hazard is imminent or has already occurred, remedial action must be taken **IMMEDIATELY** (i.e. begin containing the release, controlling ingress, notifying emergency response parties, etc...); and

   b. For non-imminent hazards, the Permittee shall submit within five (5) calendar days to the ADEQ a work plan that ensures the conditions of APC&EC Regulation No. 23 §264.15(c) are met.

5. The Permittee shall keep OB units in LOTO (from the above condition) until repairs are complete.

6. Records of inspection or repairs shall be kept as a condition of this Permit by the Permittee until approved closure of the facility.

F. PERSONNEL TRAINING

The Permittee shall conduct personnel training as described in Section H of the Part B Application.· The Permittee shall maintain training documents and records for all employees, contractors, and subcontractors who transfer, handle, sort, mix, treat, or dispose of hazardous waste until approved closure of the facility. [APC&EC Regulation No. 23 §264.16]

G. SPECIAL PROVISIONS FOR IGNITABLE, REACTIVE, OR INCOMPATIBLE WASTE

The Permittee shall follow the procedures for handling ignitable, reactive, and incompatible wastes set forth in Section F of the Part B Application. [APC&EC Regulation No. 23 §264.17(a)]

H. LOCATION STANDARDS

The Permittee shall construct, operate, and maintain the facility to prevent washout of any hazardous waste as specified in the drawings and specifications in Section G of the Part B Application. [APC&EC Regulation No. 23 §264.18(b) (1)]

I. PREPAREDNESS AND PREVENTION

1. Required Equipment

   At a minimum, the Permittee shall maintain at the facility the equipment set forth in the Contingency Plan, Section G of the Part B Application. [APC&EC Regulation No. 23 §264.32]

2. Testing and Maintenance of Equipment

   The Permittee shall test and maintain the equipment specified in the above permit condition, as necessary, to assure its proper operation in time of emergency. This test will be completed on a weekly basis. [APC&EC Regulation No. 23 §264.33]

3. Access to Communications or Alarm System

   The Permittee shall maintain access to the communications or alarm system as set forth in Sections F and G of the Part B Application.[APC&EC Regulation No. 23 §264.34]

4. Arrangements with Local Authorities

   The Permittee shall maintain arrangements with state and local authorities for emergency response. If state or local officials refuse to enter into preparedness and prevention arrangements with the Permittee, the Permittee shall document this refusal in the operating record. These can be found In Section F Attachment I of the Part B Application. The agreements are with the City of Camden Fire Department, Highland Industrial Park, Ouachita County Hospital for ambulance services, and the Calhoun County Sheriff. [APC&EC Regulation No. 23 §264.37]

J. CONTINGENCY PLAN

1. Implementation of Plan

   The Permittee shall IMMEDIATELY carry out the provisions of the Contingency Plan, Section G of the Part B Application, whenever there is a fire, explosion, or other release of hazardous waste or constituents which could threaten human health or the environment (i.e. as soon as a fire, explosion, or release occurs the Permittee begins controlling ingress, notifying emergency response parties, etc. as detailed in the Contingency Plan). [APC&EC Regulation No. 23 §264.51(b)]

2. Copies of Plan

   The Permittee shall maintain a copy of the Contingency Plan at the facility and shall provide a copy to all local police departments, fire departments, hospitals, and state and local emergency assistance teams. [APC&EC Regulation No. 23 §264.53]

3. Amendments to Plan

   a. The Permittee shall review and IMMEDIATELY amend, if necessary, the Contingency Plan in accordance with APC&EC Regulation No. 23 §264.54 for the following:

      i. The facility permit is revised;

ii. The plan fails in an emergency;

iii. The facility changes in its design, construction, operation, maintenance, or other circumstances in a way that materially increases the potential for fires, explosions, or releases of hazardous waste or hazardous waste constituents, or changes the response necessary in an emergency;

iv. The list of emergency coordinators changes; or

v. The list of emergency equipment changes.

b. Any amended Contingency Plan shall be submitted to ADEQ for review or approval within two (2) calendar days of modification.

c. The Permittee shall submit to ADEQ annually a certification statement that the Contingency Plan has been reviewed in accordance with APC&EC Regulation No. 23 §264.54 no later than the effective date of this Permit every year.

4. Emergency Coordinator

A trained emergency coordinator shall be available at all times either on the facility premises or on call in case of an emergency. [APC&EC Regulation No. 23 §§264.16(f) and 264.55]

K. MANIFEST SYSTEM

The Permittee shall comply with the manifest requirements of APC&EC Regulation No. 23 §264.71, §264.72, and §264.76.

L. RECORDKEEPING AND REPORTING

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

1. Operating Record [APC&EC Regulation No. 23 §264.73]

a. The Permittee shall maintain a written operating record; and

b. The operating record shall include the following but not be limited to:

i. A description and the quantity of each hazardous waste received, and the method(s) and date(s) of its treatment, storage, or disposal at the facility as required by APC&EC Regulation No. 23 Appendix I;

ii. The location of each hazardous waste within the facility and the quantity at each location. For all facilities, this information must include cross-references to specific manifest document numbers, if the waste was accompanied by a manifest;

iii. Records and results of waste analyses performed as specified in APC&EC Regulation No. 23 §§264.13, 264.17, and 268.7;

iv. Summary reports and details of all incidents that require implementing the contingency plan as specified in APC&EC

Regulation No. 23 §264.56(j);

v. Records and results of inspections as required by APC&EC Regulation No. 23 §264.15(d);

vi. Monitoring, testing or analytical data, and corrective action where required by APC&EC Regulation No. 23 §264, Subsection F and §§264.19, 264.191, 264.193, 264.195, and 264.602;

vii. All closure cost estimates under APC&EC Regulation No. 23 §264.142;

viii. A certification by the permittee no less often than annually, that the permittee has a program in place to reduce the volume and toxicity of hazardous waste that he generates to the degree determined by the permittee to be economically practicable; and the proposed method of treatment, storage or disposal is that practicable method currently available to the permittee which minimizes the present and future threat to human health and the environment;

ix. For an on-site treatment facility, the information contained in the notice (except the manifest number), and the certification and demonstration if applicable, required by the generator or the owner or operator under APC&EC Regulation No. 23 §268.7 or §268.8;

x. Any records required under APC&EC Regulation No. 23 §264.1G)(B); and

xi. Certifications as required by APC&EC Regulation No. 23 §264.196(f) must be maintained in the operating record until the approved closure of the facility.

2. Annual Report

The Permittee shall comply with the annual reporting requirements of APC&EC Regulation No. 23 §264.75 by preparing and submitting the report no later than March 1 of every year.

M. GENERAL CLOSURE REQUIREMENTS

1. Performance Standard

The Permittee shall close the facility, as required by APC&EC Regulation No. 23 §264.111 and in accordance with the Closure Plan, Section I of the Part B Application. [APC&EC Regulation No. 23 §264.110]

2. Amendment to Closure Plan

The Permittee shall amend the Closure Plan whenever necessary. [APC&EC Regulation No. 23 §264.112(c)]

3. Notification of Closure

The Permittee shall notify the Director or designee in writing at least sixty (60) calendar days prior to the date on which he expects to begin closure of the open burn (OB) unit or final closure of the facility. [APC&EC Regulation No. 23

§264.112(d)]

4. Time Allowed for Closure

After receiving the final volume of hazardous waste, the Permittee shall treat or remove from the unit or facility all hazardous waste and shall complete closure activities, in accordance with the schedules specified in the Closure Plan, Section I of the Part B Application. [APC&EC Regulation No. 23 §264.113]

5. Disposal or Decontamination Equipment, Structures, and Soils

The Permittee shall decontaminate or properly dispose of all contaminated equipment, structures, and soils, as required by the Closure Plan, Section I of the Part B Application. [APC&EC Regulation No. 23 §264.114]

6. Certification of Closure

The Permittee shall certify that the facility has been closed in accordance with the specifications in the Closure Plan. Within sixty (60) calendar days of completion of closure activities, Austin Powder Company must submit a Closure Certification Report for ADEQ review and approval. [APC&EC Regulation No. 23 §264.115]

7. Reserved

N. SPECIFIC CONDITIONS

1. Waste Minimization

The Permittee shall submit a certified report (according to APC&EC Regulation No. 23 §270.11) in writing annually by December 1, for the previous year ending September 30, that discusses the following items: [APC&EC Regulation No. 23 §264.73(b)(9)]

a. The Permittee shall have a program in place to reduce the volume and toxicity of all hazardous wastes which are generated by the Permittee's facility's operation to the degree determined to be economically practicable; and the proposed method of treatment, storage, or disposal is that practical method currently available to the Permittee which minimizes the present and future threat to human health and the environment. This certified report shall address the items below:

i. Any written policy or statement that outlines goals, objectives, and/or methods for source reduction and recycling of hazardous waste at the facility;

ii. Any employee training or incentive programs designed to identify and implement source reduction and recycling opportunities;

iii. Any source reduction and/or recycling measures implemented in the last five years or planned for the near future;

iv. An itemized list of the dollar amounts of capital expenditures (plant and equipment) and operating costs devoted to source reduction and recycling of hazardous waste;

v. Factors that have prevented implementation of source reduction

and/or recycling;

vi. Sources of information on source reduction and/or recycling received at the facility (e.g., local government, trade associations, suppliers, etc.);

vii. An investigation of additional waste minimization efforts which could be implemented at the facility. This investigation shall analyze the potential for reducing the quantity and toxicity of each waste stream through production reformulation, recycling, and all other appropriate means. The analysis shall include an assessment of the technical feasibility, cost, and potential waste reduction for each option;

viii. The Permittee shall submit a flow chart or matrix detailing all hazardous waste it produces, by quantity and type and by building or area; and

ix. The Permittee shall demonstrate the need to use those processes which could produce a particular hazardous waste due to a lack of alternative processes that would produce less volume of hazardous waste.

b. The Permittee shall include this certified report in the operating record until approved closure of the facility.

2. Dust Suppression

The Permittee shall not use waste, used oil, or any other material which is contaminated with dioxin, polychlorinated biphenyls (PCBs), or any other hazardous waste (other than a waste identified solely on the basis of ignitability) for dust suppression or road treatment. [APC&EC Regulation No. 23 §§266.23(b) and 279.82]

3. Permit Review

This Permit may be reviewed at any time (A.C.A. §8-7-220) and shall be modified as necessary as provided by APC&EC Regulation No. 23 §270.41.

4. Reserved

O. RESERVED

P. GENERAL CONTINGENT POST-CLOSURE REQUIREMENTS

1. The Permittee shall submit to ADEQ for approval a Post-Closure Plan within sixty (60) calendar days of the effective date of this permit that is contingent on clean closure NOT being achieved during closure activities.

2. Post-Closure Care Period

The Permittee shall begin post-closure care for each unit that is not clean closed after completion of closure of the unit and continue for thirty (30) years after that date. Post-closure care shall be in accordance with Regulation No. 23 §264.117 and the Post-Closure Plan in Section I of the Part B Application, unless the time

period is reduced as provided in Regulation No. 23 §264.117(a)(2)(i) or extended as provided in Regulation No. 23 §264.117(a)(2)(ii).

3. Post-Closure Security

The Permittee shall maintain security at the facility during the post-closure care period in accordance with the Post-Closure Plan in Section I of the Part B Application. [Regulation No. 23 §264.117(b)]

4. Amendment to Post-Closure Plan

The Permittee shall amend the Post-Closure Plan whenever necessary and submit to the ADEQ for review and approval within five (5) calendar days after modification. [APC&EC Regulation No. 23 §264.118(d)]

5. Post-Closure Notices

a. No later than sixty (60) calendar days after certification of closure of each hazardous waste disposal unit, the Permittee shall submit to the local zoning authority, or the authority with jurisdiction over local land use, and to ADEQ, records of the type and quantity of hazardous waste disposed within each cell or disposal unit. [APC&EC Regulation No. 23 §264.119(a)]

b. Within sixty (60) calendar days of certification of closure of the first hazardous waste disposal unit and the last hazardous waste disposal unit, the Permittee shall do the following:

i. Record a notation on the deed to the facility property; and [APC&EC Regulation No. 23 §264.119(b)(l)]

ii. Submit a certification to the ADEQ that a notation has been recorded. [APC&EC Regulation No. 23 §264.119(b)(2)]

c. The Permittee shall submit a request to ADEQ and obtain a Permit modification prior to post-closure removal of hazardous wastes, hazardous waste residues, liners, or contaminated soils. [APC&EC Regulation No. 23 §264.119(c)]

6. Certification of Completion of Post-Closure Care

The Permittee shall submit to ADEQ for approval within sixty (60) calendar days of completion of the established post-closure care period for each unit a certification that the post-closure care period was performed in accordance with the specifications in the Post-Closure Plan. Documentation supporting the certification report shall be kept until the Director or designee releases the owner or operator from the financial assurance requirements for post-closure care. [APC&EC Regulation No. 23 §264.120]

Q. FINANCIAL ASSURANCE

1. Cost Estimate for Facility Closure and Post-Closure

a. The Permittee's initial closure and post-closure cost estimate, prepared in accordance with APC&EC Regulation No. 23 §264.142, §264.144,

§264.197(c)(3) and (5), §264.228(c)(2), and §264.258(c)(2), are specified in Section I of the Part B Application.

b. The Permittee shall adjust and submit annually to ADEQ for review and approval the closure cost estimate and post-closure cost estimate adjusted for inflation no sooner than sixty (60) calendar days prior and no later than thirty (30) days prior to the anniversary date of the establishment of the financial instrument(s) used to comply with APC&EC Regulation No. 23 §264.143 and Permit Module II, Condition Q.3, Liability Requirements, or when using an approved state-required mechanism, upon such date as required by the state. [APC&EC Regulation No. 23 §264.142(b)]

c. The Permittee shall revise and submit for ADEQ approval the closure cost estimate and post-closure cost estimate whenever there is a change in the facility's Closure Plan or Post-Closure Plan as required by APC&EC Regulation No. 23 §264.142(c) and §264.144(c).

d. The Permittee shall keep at the facility the latest closure cost estimate and post-closure cost estimate until approved closure of the facility. [APC&EC Regulation No. 23 §264.142(d) and §264.144(d)]

2. Financial Assurance for Facility Closure/Post-Closure

The Permittee shall demonstrate continuous compliance with APC&EC Regulation No. 23 §264.143, §264.145, and §264.146 by providing documentation of financial assurance, as required by APC&EC Regulation No. 23 §264.143, §264.145, §264.146, §264.147, or §264.149 in no less than the amount of the most current cost estimates required by Permit Module II, Condition Q.1., Cost Estimate for Facility Closure/Post-Closure. The Permittee's method of financial assurance as shown in the Part B Application is a letter of credit. Changes in financial assurance mechanisms shall be approved by the Director or designee pursuant to APC&EC Regulation No. 23 §264.143 and §264.145.

3. Liability Requirements

The Permittee shall have and maintain liability coverage for sudden accidental occurrences of at least $1 million per occurrence, with an annual aggregate of at least $2 million, exclusive of legal defense costs. [APC&EC Regulation No. 23 §264.147(a)] The Permittee shall submit annually to ADEQ for approval the financial mechanism used to comply with this condition no sooner than sixty (60) calendar days and no later than thirty (30) calendar days prior to the anniversary of the mechanism.

4. Cost Estimate for Corrective Action

a. The Permittee shall, within ninety (90) calendar days of the effective date of this Permit, submit a detailed and itemized cost estimate for the corrective actions required in Permit Module XII(b) to the Director or designee for concurrence. Such estimate shall be based on costs to the Permittee of hiring a third party to perform the corrective actions. (A third party is a party who is neither a parent nor a subsidiary of the Permittee).

b. The cost estimates for Corrective Action under Permit Module XII(b) shall be reviewed and evaluated in the same manner as for the closure [and post-closure] cost estimates required in Module II Condition Q.1 of this permit. The Corrective Action cost estimate must be submitted annually to ADEQ for review and approval no sooner than sixty (60) calendar days prior and no later than thirty (30) days prior to the anniversary date of the establishment of the financial instrument(s). Adjustments to the cost estimates shall be made during the annual evaluation and are necessary due to:

i. Inflation, as determined using the procedures outlined in APC&EC Regulation No. 23 §264.142(b); and

ii. Changes in the corrective actions and as various tasks of the investigation, remedy selection, design and implementation work are completed allowing more accurate cost estimates.

5. Financial Assurance for Corrective Action

a. The Permittee shall financially assure the corrective actions required pursuant to Permit Module XII(b) by use of a Surety Bond, Letter of Credit, Closure Insurance, Trust Fund, Financial Test or Corporate Guarantee, or a combination of these as outlined in APC&EC Regulation No. 23 §264.143 and following the procedures as required pursuant to Permit Module II, Condition Q.2. The phasing of financial assurance for corrective action may be allowed with prior approval of the Director or designee for specific work phases. This condition will not apply to previously completed work.

b. "Phasing" financial assurance for corrective action may be considered, subject to approval by the Director or designee, when a final Remedial Action Decision for corrective action at the facility has not yet been made or approved, in order to reduce the uncertainty of costs for which the Permittee must provide financial assurance. Phased Financial Assurance for Corrective Action shall consist of two (2) phases: Phase I shall address the costs of investigating conditions at the facility, and evaluating the appropriate courses of remedial actions. Phase II shall include the costs of designing appropriate corrective measures and implementing the selected remedy pursuant to the Remedial Action Decision Document (RADD), to include any necessary operations and maintenance (O&M) activities. The Corporate Financial Test, Corporate Guarantee, or Corrective Action Trust Fund may not be used as mechanisms when financial assurance for corrective action is phased.

c. In phasing these cost estimates, the Permittee shall first estimate and provide compliant financial assurance for Phase I pursuant to Permit Module II, Condition Q.5.b. Within one hundred eighty (180) calendar days of the issuance of a Remedial Action Decision Document (RADD), the Permittee is then responsible for establishing compliant financial assurance for Phase II.

d. Mechanism Selection

i. The Permittee shall, within ninety (90) calendar days of the effective date of this Permit, submit to the Director or designee for approval the wording of a Corrective Action Financial Assurance (CAFA) Instrument(s). The Director or designee shall be named as third party beneficiary of any Corrective Action Trust Fund which may be established.

ii. The Permittee shall within one hundred eighty (180) calendar days of the effective date of this Permit, submit an executed CAFA Instrument(s) as approved by the Director or designee pursuant to Permit Module II, Condition Q.5.a above.

iii. In the event a Trust Fund is selected as the CAFA Instrument, the Permittee shall fund the Trust Fund in accordance with the following:

1. The pay-in period for the Trust Fund shall be the estimated time frame to complete the work addressed, or ten (10) years, whichever is shorter.

2. The initial payment into the Trust Fund shall be made within one hundred eighty (180) calendar days of the effective date of this Permit.

3. Annually, on the anniversary of the initial payment, the Permittee shall make payments into the Trust Fund for the duration of the pay-in period.

4. The amount of the payments into the Trust Fund shall be determined by the following formula:

$$\frac{CE-CV}{Y} = \text{payment}$$

Where CE is the most recent estimate of the required Trust Fund Balance, CV is the current value of the Trust Fund, and Y is the number of years remaining in the pay-in period.

5. The Corrective Action Trust Fund shall be additionally guaranteed with a Surety Bond, Letter of Credit, Closure Insurance, or a combination of these.

6. <u>Changes in Financial Assurance Mechanisms</u>

a. Changes in financial assurance mechanisms shall be approved by the Director or designee pursuant to APC&EC Regulation No. 23 §264.143 and §264.145.

b. Any changes of financial assurance instruments shall be considered a Class 1 permit modification, subject to prior approval of the Director or designee.

7. Incapacity of Owners or Operators, Guarantors, or Financial Institutions

The Permittee shall comply with APC&EC Regulation No. 23 §264.148 whenever necessary.

R. RESERVED

S. RESERVED

End of Module II

MODULE XI- GROUND WATER COMPLIANCE MONITORING

A. MODULE HIGHLIGHTS

This module covers ground water compliance monitoring for a RCRA regulated Hazardous Waste Management unit known as Austin Powder Open Burn (OB) Unit. The OB unit consists of three (3) steel bum pans approximately eight (8) feet in diameter topped by wire mesh cages eleven (11) feet in height. The OB unit receives various amounts of waste and materials contaminated with explosives generated by the explosives manufacturing process. These wastes and materials consist of 1) wastewater treatment sludge from the manufacturing and processing of explosives (K044); 2) spent carbon from the treatment of wastewater containing explosives (K045); and 3) waste materials containing 2,4,6-trinitrotoluene (TNT), TNT-mixtures, or Pentaerythritol Tetranitrate (PETN), and off-specification or outdated explosives (D003).

The ground water compliance monitoring system at the OB unit consists of one (1) upgradient well (MW-1), fifteen (15) downgradient monitoring wells, and two (2) downgradient monitoring wells used for ground water level measurements only. Eight (8) of the sixteen (16) downgradient monitoring wells are located in the immediate vicinity of the OB unit and are nested pairs consisting of one (1) shallow well that is screened at the top of the aquifer and one (1) deeper well that is screened at the base of the aquifer. Two (2) monitoring wells (MW-16R and MW-17) are installed at the point of compliance as shown in Permit Attachment XI-1.

Concentration limits for constituents of concern (COC) in ground water are background values found at the upgradient well MW-1 that represent the quality of background ground water unaffected by leakage from the regulated OB unit.

B. WELL LOCATION, INSTALLATION AND CONSTRUCTION

The Permittee shall maintain a ground water monitoring system, as specified below: [APC&EC Regulation No. 23 §264.99(b)]

1. The Permittee shall maintain ground water monitoring wells at the locations specified on the map in Permit Attachment XI-1 and in accordance with the following list:

Existing Wells	
Upgradient	Downgradient
MW-1	MW-2*, Austin Well*
	MW-3S, MW-3D
	MW-4S, MW-4D
	MW-5S, MW-5D
	MW-6S**, MW-6SS**
	MW-11,MW-12,MW-14
	MW-15,MW-16R,MW-17,MW-18

*Monitoring well(s) used for ground water level measurements only.

** MW-6S is the deep well and MW-6SS is the shallow well for this nested pair.

2. The Permittee shall maintain the monitoring wells identified in Permit Module XI, Condition B.1., in accordance with the plans and specifications presented in Permit Attachment XI-2 and XI-3.

3. Within ninety (90) calendar days from the effective date of this permit, Permittee shall assess the integrity of the monitoring wells listed in the Permit Module XI, Condition B.1. Wells to be included in the monitoring program shall be installed in accordance with the construction and performance standards of the RCRA Groundwater Monitoring Technical Enforcement Guidance Document, 1986, OSWER Directive 9950.1, or an alternative standard approved by the Director or designee. Any wells not included in the monitoring program shall not compromise the integrity of the monitoring program and shall not permit the migration of chemical contaminants from the surface to the subsurface or between hydrogeological units. Permittee shall, within thirty (30) calendar days of completion of the integrity assessment, submit a written report to ADEQ for review and approval of the results of the assessment. The report shall identify any reason wells were determined to be improperly constructed, and a schedule for plugging and abandoning such wells.

   a. If the integrity assessment indicates any of the Permittee's monitoring program wells are improperly constructed, Permittee shall submit a schedule as part of the written integrity assessment report for the replacement of any improperly constructed wells.

      i. Any replacement monitoring well(s) shall be constructed in accordance with the plans and specifications presented in Permit Module XI Attachments XI-2 and XI-3.

      ii. Upon ADEQ approval, the replacement monitoring well(s) shall become a part of this Permit.

      iii. The Permittee shall begin sampling according to the approved schedule.

4. Any changes to the monitoring program, such as changes in the quantity, location, depth, design, or replacement of wells, will require a Permit Class 1 or Permit Class 2 modification. [APC&EC Regulation No. 23 § 270.42 Appendix I, Part C.1.a or C.1.b]

5. All wells deleted from the monitoring program shall be plugged and abandoned in accordance with Permit Module XI Attachment XI-2. Well plugging and abandonment methods and certification shall be submitted to the ADEQ within thirty (30) calendar days from the date the wells are removed from the monitoring program.

C. GROUND WATER PROTECTION STANDARD

1. The Permittee shall monitor the ground water to determine whether regulated units are in compliance with the ground water protection standard under APC&EC Regulation No. 23 §264.92. The list of indicator parameters and site specific constituents and their concentration limits are listed in Permit Module XI Attachment XI-4. [APC&EC Regulation No. 23 §264.93 and §264.94]

a. The Permittee shall submit a revised Groundwater Sampling and Analysis Plan for approval by the ADEQ, within thirty (30) calendar days of the effective date of the Permit. Upon approval, this plan shall become a part of this Permit and shall replace the current sampling plan in Section E - Attachment IV of the Part B Application. Permittee shall follow the sampling schedule in the approved Groundwater Sampling and Analysis Plan.

2. The Permittee shall monitor well numbers: MW-16R and MW-17 at the point of compliance, as described in Permit Module XI, Condition B.1., and as designated in Permit Attachment XI-I. [APC&EC Regulation No. 23 §264.95]

3. The compliance period, during which the ground-water protection standard applies, is in effect until ADEQ approval of closure of the regulated unit. The compliance period shall begin at the time Austin Powder Co. begins the compliance monitoring program. [APC&EC Regulation No. 23 §264.96(a) and (b)]

   If the Permittee is conducting corrective action at the end of the compliance period specified, then the compliance period shall be extended until the Permittee demonstrates that the ground water protection standard has not been exceeded for three consecutive years. [APC&EC Regulation No. 23 §264.96(c)]

D. SAMPLING AND ANALYSIS PROCEDURES

The Permittee shall use the following techniques and procedures when obtaining and analyzing samples from the ground water monitoring wells described in Permit Module XI, Condition B.1.: [APC&EC Regulation No. 23 §264.97(d) and (e)] (Procedures and techniques found below will be replaced with updated Groundwater Sampling and Analysis Plan as described in Permit Module XI, Condition C.1.a.)

1. Samples shall be collected using the techniques described m Section E - Attachment IV of the Part B Application;

2. Samples shall be preserved and shipped off site for analysis in accordance with the procedures specified in Section E- Attachment IV of the Part B Application;

3. Samples shall be analyzed in accordance with the procedures specified in Section E- Attachment IV of the Part B Application;

4. Samples shall be tracked and controlled using the chain-of-custody procedures specified in Section E- Attachment IV of the Part B Application; and

5. The Permittee must determine whether there is statistically significant evidence of increased contamination for any chemical parameter or hazardous constituent specified in the permit, pursuant to APC&EC Regulation No. 23 §264.99(a), at a frequency specified under APC&EC Regulation No. 23 §264.99(f). The concentration of hazardous constituents in the ground water at the compliance point must be determined by collecting a sequence of at least four samples from each well (background and compliance wells) at least semi-annually during the compliance period which was specified in Permit Module XI, Condition C.3.

[APC&EC Regulation No. 23 §264.99(d)]

E. ELEVATION OF THE GROUND WATER SURFACE

1. The Permittee shall determine the ground water surface elevation at each monitoring well each time ground water is sampled in accordance with Permit Module XI, Condition G. [APC&EC Regulation No. 23 §264.97(f)]

F. STATISTICAL PROCEDURES

1. When evaluating the monitoring results in accordance with Permit Module XI, Condition G., the Permittee shall use one of the following procedures: (All statistical procedures shall be conducted in accordance with USEPA Unified Guidance Document, Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, March 2009)

    a. A parametric analysis of variance (ANOVA) followed by multiple comparisons procedures to identify statistically significant evidence of contamination. The method used must include estimation of testing of the contrasts between each compliance well's mean and the background mean levels for each constituent; [APC&EC Regulation No. 23 §264.97(h)(l)]

    b. An analysis of variance (ANOVA) based on ranks followed by multiple comparisons procedures to identify statistically significant evidence of contamination. The method must include estimation and testing of the contrasts between each compliance well's median and the background median levels for each constituent; [APC&EC Regulation No. 23 §264.97(h)(2)]

    c. A tolerance or prediction interval procedure in which an interval for each constituent is established from the distribution of the background data, and the level of each constituent in each compliance well is compared to the upper tolerance or prediction limit; [APC&EC Regulation No. 23 §264.97(h)(3)]

    d. A control chart approach that gives control limits for each constituent; or [APC&EC Regulation No. 23 §264.97(h)(4)]

    e. Another statistical test method submitted by the owner or operator and approved by the ADEQ. [APC&EC Regulation No. 23 §264.97(h)(5)]

2. Any statistical method chosen in Permit Module XI, Condition F., shall comply with the following standards:

    a. The statistical method used to evaluate ground water monitoring data shall be appropriate for the distribution of chemical parameters or hazardous constituents. If the distribution of the chemical parameters or hazardous constituents is shown by Permittee to be inappropriate for a normal theory test, then the data should be transformed or a distribution-free theory test should be used. If the distributions for the constituents differ, more than one statistical method may be needed; [APC&EC Regulation No. 23 §264.97(i)(1)]

b. If an individual well comparison procedure is used to compare an individual compliance well constituent concentration with background constituent considerations or a ground water protection standard, the test shall be done at a Type 1 error level no less than 0.01 for each testing period. If a multiple comparisons procedure is used, the Type 1 experience-wise error rate for each testing period shall be no less than 0.05; however, the Type 1 error of no less than 0.01 for individual well comparisons must be maintained. This performance level does not apply to tolerance intervals, prediction intervals, or control charts; [APC&EC Regulation No. 23 §264.97(i)(2)]

c. If a control chart approach is used to evaluate ground water monitoring data, the specific type of control chart and its associated parameter values shall be proposed by Permittee and approved by the ADEQ; [APC&EC Regulation No. 23 §264.97(i)(3)]

d. If a tolerance level or a prediction interval is used to evaluate ground water monitoring data, the levels of confidence and, for tolerance levels, the percentage of the population that the interval must contain, shall be proposed by Permittee and approved by the ADEQ. These parameters will be determined after considering the number of samples in the background database, the data distribution, and the range of the concentration values for each constituent of concern. [APC&EC Regulation No. 23 §264.97(i)(4)]

e. The statistical method shall account for data below the limit of detection with one or more statistical procedures that are protective of human health and the environment. Any practical quantitation limit (PQL) that is used in the statistical method shall be the lowest concentration level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions that are available to the facility; and [APC&EC Regulation No. 23 §264.97(i)(5)]

f. If necessary, the statistical method shall include procedures to control or correct for seasonal and spatial variability as well as temporal correlation in the data. [APC&EC Regulation No. 23 §264.97(i)(6)]

G. MONITORING PROGRAM AND DATA EVALUATION

The Permittee shall determine ground-water quality as follows:

1. The Permittee shall collect, preserve, and analyze ground-water samples pursuant to Permit Module XI, Condition D;

2. The Permittee shall determine the concentration of hazardous constituents as (specified in Permit Module XI, Condition C., in ground water at each monitoring well (required under Permit Module XI, Condition B.), at the compliance point, during the compliance period. These determinations shall be made semi-annually during the compliance period; [APC&EC Regulation No. 23 §264.99(d)]

3. The Permittee shall determine the ground-water flow rate and direction in the uppermost aquifer at least annually; [APC&EC Regulation No. 23 §264.99(e)]

4. For each hazardous constituent identified in Permit Module XI, Condition C., the Permittee shall determine whether statistically significant evidence of increased contamination exists. In determining whether such an increase has occurred, the Permittee shall use the method(s) specified in the permit under APC&EC Regulation No. 23 §264.97(h). The method(s) must compare data collected at the compliance point(s) to a concentration limit developed in accordance with APC&EC Regulation No. 23 §264.94; and [APC&EC Regulation No. 23 §264.99(d)(l) and §264.99(d)(2)]

5. The Permittee shall perform the statistical evaluation required by Permit Module XI, Condition 0.4., and submit to ADEQ for approval within thirty (30) calendar days from completion of the sampling analysis. [APC&EC Regulation No. 23 §264.99(d)(2) and §270.30(1)(4)]

H. REPORTING AND RECORDKEEPING

1. The Permittee shall enter all monitoring, testing, and analytical data obtained pursuant to Permit Module XI, Condition G., in the operating record. The data must include all computations, calculated means, variances, and results of statistical tests. [APC&EC Regulation No. 23 §264.73(b)]

2. The Permittee shall collect samples as required by Permit Module XI, Conditions E.1., 0.2., G.3., and 0.4., semi-annually during the preceding months of April-June and October-December.

3. The Permittee shall submit the analytical results required by Permit Module XI, Conditions E.1., G.2., G.3., and 0.4., within thirty (30) calendar days from completion of the sampling analysis.

4. If the Permittee determines, pursuant to Permit Module XI, Condition G., there is a statistically significant increase above the concentration limits for the constituents specified in Permit Attachment XI-4 (indicating that the ground-water protection standard is being exceeded), the Permittee shall notify the ADEQ in writing within seven (7) calendar days. [APC&EC Regulation No. 23 §264.99(h)(l)]

I. ASSURANCE OF COMPLIANCE

The Permittee shall assure that monitoring and corrective action measures necessary to achieve compliance with the ground water protection standard are taken during the term of the Permit.

J. SPECIAL REQUIREMENT IF THE GROUND-WATER PROTECTION STANDARD IS EXCEEDED

1. The Permittee shall notify the ADEQ in writing within seven (7) calendar days if the ground water protection standard has been exceeded at any monitoring well. The notification must indicate which concentration limits have been exceeded. [APC&EC Regulation No. 23 §264.99(h)(1)]

2. The Permittee must submit to the ADEQ a permit modification to establish a corrective action program meeting APC&EC Regulation No. 23 §264.100 requirements within one hundred eighty (180) calendar days, or within ninety (90)

calendar days if the Permittee has previously submitted an engineering feasibility study if the ground water protection standard has been exceeded at any monitoring well at the point of compliance. [APC&EC Regulation No. 23 §264.99(h)(2)]

3. The Permittee may make a demonstration that the ground water protection(standard was exceeded due to sources other than a regulated unit or errors in sampling, analysis or evaluation. [APC&EC Regulation No. 23 §264.99(i)]

   a. The Permittee must notify ADEQ in writing, within seven (7) calendar days, that a demonstration will be made. [APC&EC Regulation No. 23 §264.99(i)(1)]

   b. The Permittee must submit a report to ADEQ, within ninety (90) calendar days, that demonstrates that a source other than a regulated unit caused the ground water protection standard to be exceeded or that the apparent noncompliance was a result of an error in sampling, analysis, or evaluation. [APC&EC Regulation No. 23 §264.99(i)(2)]

   c. The Permittee shall submit to ADEQ within ninety (90) calendar days an application for a permit modification to make any appropriate changes in the compliance monitoring program at the facility. [APC&EC Regulation No. 23 §264.99(i)(3)]

   d. The Permittee shall continue the compliance monitoring program in accordance with APC&EC Regulation No. 23 §264.99.

4. If the Permittee or ADEQ determines that the compliance monitoring program no longer satisfies the requirements of APC&EC Regulation No. 23 §264.99, the Permittee shall submit a permit modification application within ninety (90) calendar days of the determination detailing appropriate changes to the compliance monitoring program. [APC&EC Regulation No. 23 §264.99(j)]

K. REQUEST FOR PERMIT MODIFICATION

1. If the Permittee or ADEQ determines the ground water protection standard is being exceeded, the Permittee shall submit to the ADEQ an application for a permit modification to establish a corrective action program, within one hundred eighty (180) days, or within ninety (90) days if an engineering feasibility study has been previously submitted to the ADEQ. [APC&EC Regulation No. 23 §264.99(h)(2) and §270.42]

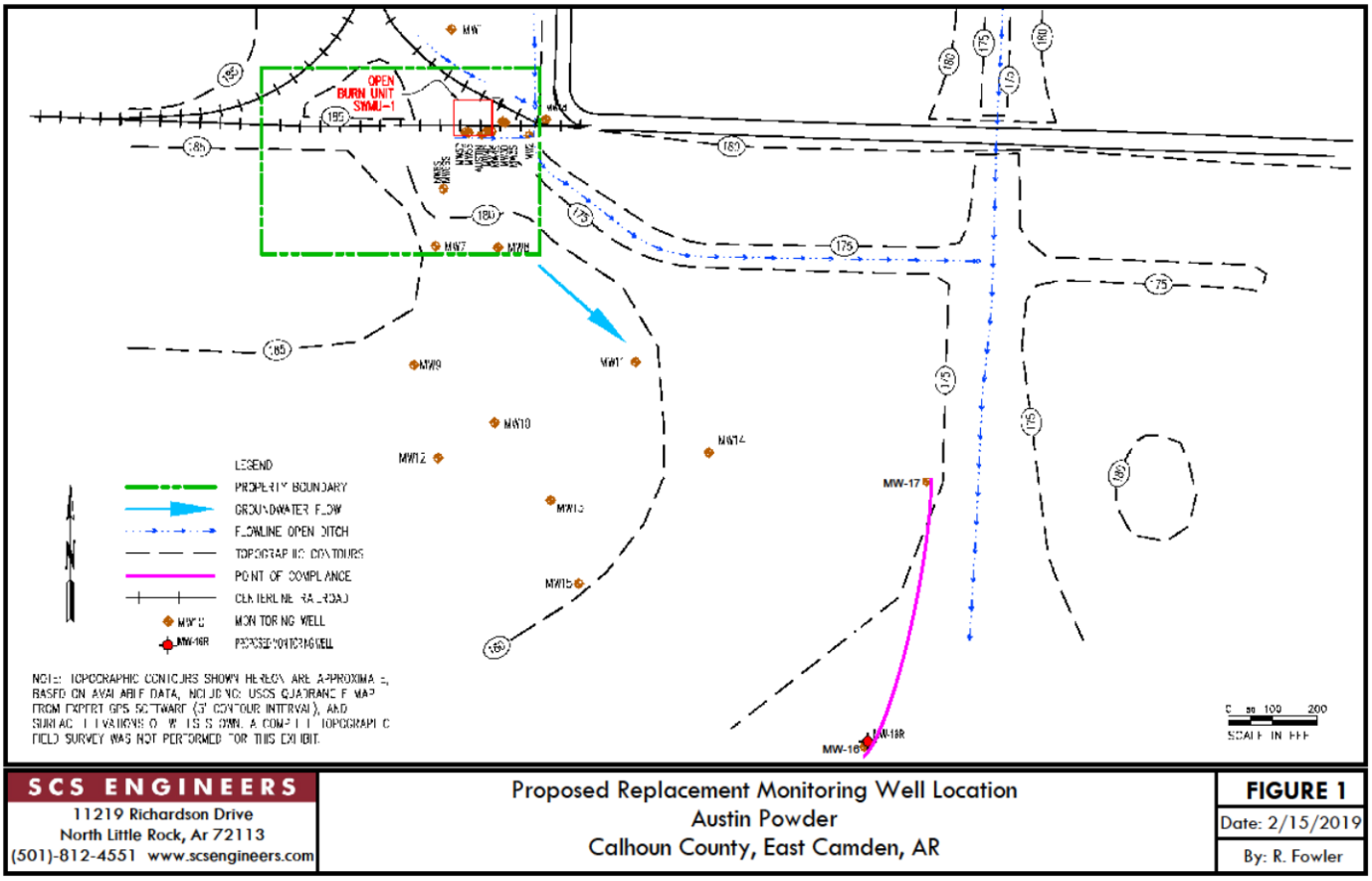
2. If the Permittee or ADEQ determines the compliance monitoring program no longer satisfies the requirements of APC&EC Regulation No. 23 §264.99, then, within ninety (90) days, the Permittee shall submit an application for a permit modification to make any appropriate changes to the program. [APC&EC Regulation No. 23 §264.99(j)]

End of Module XI

MODULE XI- ATTACHMENT INDEX

Permit Attachment No.	Plan or Document
XI- 1	Facility Map depicting the regulated unit, monitoring well locations, and point of compliance
XI- 2	Monitoring Well Construction, Geotechnical Boreholes, and Plug and Abandonment Procedures
XI- 3	Monitoring Well Construction Diagram
XI- 4	Groundwater Monitoring Constituents

PERMIT ATTACHMENT XI- 1



SCS ENGINEERS 11219 Richardson Drive North Little Rock, Ar 72113 (501)-812-4551 www.scsengineers.com	Proposed Replacement Monitoring Well Location Austin Powder Calhoun County, East Camden, AR	FIGURE 1 Date: 2/15/2019 By: R. Fowler

PERMIT ATTACHMENT XI- 2

ARKANSAS DEPARTMENT OF ENVIRONMENTAL QUALITY HAZARDOUS WASTE DIVISION

INTERIM POLICY
PRCR 96-4

POLICY#: HWD - 002

Monitoring Well Construction, Geotechnical Boreholes, and Plug & Abandonment Policy

I. STATEMENT OF ISSUE

There are occasions when facilities are required or desire to install groundwater monitoring wells, plug and abandon monitoring wells, or install geotechnical boreholes for the purpose of obtaining samples for chemical analysis of groundwater and other physical data. The data obtained is used to evaluate the environmental impact on hydrogeologic conditions from facility operations.

Properly located, designed, installed, and maintained monitoring wells are necessary for obtaining representative groundwater samples and to protect the environment. Improperly located, designed, installed, and/or maintained monitoring wells can increase a facility's liabilities by failing to identify environmental impact at an early stage or providing a mechanism for contaminants to migrate into uncontaminated areas. Failure to follow proper procedures could result in introducing additional contaminants to the subsurface.

The Arkansas Department of Environmental Quality (ADEQ) does not regulate individuals who drill and/or install ground water monitoring wells, nor individuals who conduct hydrogeologic investigations. However, such individuals are regulated by other Arkansas agencies in accordance with state law. Drillers and well/pump installers are regulated by the Arkansas Water Well Construction Commission (AWWCC). The practice of geology is regulated by the Arkansas Board of Registration for Professional Geologists. Land surveying and engineering are regulated by the Arkansas Board of Registration for Professional Engineers and Land Surveyors.

ADEQ has various authorities which require groundwater investigations, monitoring, and corrective action. This policy is directed at facilities conducting subsurface investigations, monitoring, and/or remediation related to hazardous waste or hazardous substance sites. This policy of the Hazardous Waste Division (HWD) provides a set of guidelines for facilities conducting such surveys. Any work plans, site investigations, or other hydrogeologic reports submitted to the HWD must reflect compliance with this policy or may be unaccepted.

II. STATEMENT OF POLICY

All monitoring wells, piezometers, other specialty well designs, and other related permanently installed equipment shall be installed, repaired, and abandoned in a manner which complies with all applicable state laws and as specifically directed by ADEQ.

1. It shall be the policy of the ADEQ HWD that all monitoring wells, piezometers, specialty well designs, and other related permanently installed equipment be installed, repaired, or abandoned by qualified persons utilizing appropriate methods in accordance with AWWCC Code Rules and Regulations (revised August 1993) as applicable. Copies are available from:

   Arkansas Water Well Construction Commission
   101 E. Capitol, Suite 350
   Little Rock, Arkansas 72201

2. At a minimum, the design and construction techniques published by the United States Environmental Protection Agency (USEPA) in the Resource Conservation and Recovery Act (RCRA) Ground Water Monitoring Technical Enforcement Guidance Document (TEGD) shall be used as a guide in the location, construction, and design of monitoring wells, in accordance with AWWCC rules and regulations. Therefore, it shall be the policy of the HWD to assure that this is accomplished in an orderly scientific manner by the following procedures:

   a. The HWD will review hydrogeologic work plans, investigations, reports, and other submittals for compliance with the RCRA TEGD and the AWWCC rules and regulations for installing and/or plugging and abandoning of boreholes and groundwater monitoring wells. Failure to follow the RCRA TEGD and/or the AWWCC may result in both non-approval of submitted documents and possible notification to the AWWCC.

   b. The HWD will conduct Comprehensive Groundwater Monitoring Evaluation (CME), Operation and Maintenance (O&M), and/or other site inspections to discern if the groundwater monitoring system is in compliance.

3. Well Installation Procedures

It is assumed that the site hydrogeology has been characterized and all pertinent data have been collected, evaluated, and certified to the degree necessary to properly design and locate the well in a manner suitable for its intended purpose.

Geological conditions and interpretations must be certified by an Arkansas Registered Professional Geologist. As previously stated, the Arkansas Board of Registration for Professional Geologists (Board) maintains the certification of individuals, not the HWD of ADEQ. Failure to follow the bylaws of the Board, will be addressed by the Board.

a Well Design

There are several well designs which are acceptable for use at sites regulated by the HWD. Final well designs are generally evaluated on a case-by-case basis in conjunction with site-specific information to accommodate specific needs. In any case, the design, construction materials, and installation materials are to be

suitable for the site-specific situation. The publications containing acceptable designs, construction methods, and standard construction practices used in the decision process are the following:

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

ii. ASTM Designation: D 5092-90 Standard Practice for Design and Installation of Ground Water Monitoring Wells in Aquifers

iii. USEPA Handbook of Suggested Practices for the Design and Installation of Ground-Water Monitoring Wells, March 1991, EPA/600/4-89/034

b. Drilling Practices

i. All drilling and well installations must be performed by qualified persons registered or specifically exempted by the AWWCC. Individuals performing these services are responsible for filing any applicable AWWCC reports. As previously stated, AWWCC regulates these individuals, not the HWD of ADEQ. Failure to follow the AWWCC Code Rules and Regulations will be addressed by the AWWCC.

As a general rule, there is no single drilling method which is suitable for all geological conditions likely to be encountered in this state. The drilling method selected must be based upon the geological conditions likely to be encountered, the type of information to be collected, and to minimize the potential for cross-contamination between intervals. Air drilling is generally not an acceptable method for the collection of samples for chemical analysis or geotechnical information.

ii. All drilling equipment and well materials must be properly decontaminated prior to commencement of activities. This is usually demonstrated with decontamination blanks as part of a QA/QC program.

iii. All drill cuttings and drilling fluids must be properly managed in a manner that minimizes contamination to the immediate area and complies with Arkansas Pollution Control and Ecology Commission APC&EC Regulation No. 23 (hazardous waste management) requirements. This is accomplished by containerizing the drill cuttings, drilling fluids, formation water, decontamination wastes, etc. Investigation-derived waste is considered the generation of a potential hazardous waste. Prior to disposal, this investigation-derived waste must be managed as hazardous waste until a determination under APC&EC Regulation No. 23 Section 261 is made. Such wastes are also subject to hazardous waste accumulation and storage requirements.

iv. Drilling fluids must only be used when necessary to maintain stable borehole conditions. Drillers using the mud rotary method of drilling must ensure an adequate volume of mud is available to complete the borehole prior to initiating drilling activities. In general, 1.5 - 3 times the volume of the finished hole is the required mud volume. The volume of the hole must be based upon the largest diameter drill bit intended to be used in

that boring. Only potable water or water of known chemistry must be used in drilling fluids. The HWD advises extreme caution when using mud- or wash-rotary drilling techniques, due to the potential of cross-contamination and well development difficulties associated with the mud cake. Any additive must not adversely affect borehole stability, groundwater quality, or analytical objectives.

v. All boreholes in which a monitoring well is to be constructed must be continuously logged, unless the site-stratigraphy is well established. In cases where the site-stratigraphy is well established, a monitoring well may be logged at an appropriate interval for both well correlation and screen placement. Standard coring devices must be used to collect samples. Logging from drill cuttings is generally not an acceptable practice. ASTM Designation: D 2488-84 Standard Practice for Description and Identification of Soils (Visual-Manual Procedure) is the HWD's preferred soil classification system. Examples of the information required on boring logs can be found in the referenced documents.

c. Well Construction

i. All monitoring wells must be cased. Both single and multiple casing well designs are acceptable. Multiple well casing designs must be used when contaminated zones of saturation are isolated by a confining layer from lower intervals to be investigated or monitored. When using multiple casing designs, the cement slurry must be allowed to cure (according to the manufacturer or other published references) prior to drilling into lower intervals. Driven (including hydraulically pushed) wells are not acceptable for permanent monitoring locations, but may be used temporarily in investigations provided they are removed and the borehole is properly plugged and abandoned as described herein.

ii. The following are standard components of a permanent monitoring well: bottom sump, screen, casing, centralizer, annulus, filter pack, bentonite seal, annular grout, surface seal, protective equipment, and a well cap.

In general, the sump, screen and casing must be composed of chemically inert materials suitable for the site-specific variables. There are numerous commercially available material types that are suitable for monitoring wells. Selection of the appropriate type of material must be based upon site-specifics and published references. Commonly-approved materials are PVC, stainless steel, fluoropolymer materials (PFTE), and fiberglass reinforced epoxy resins.

iii. A sump must be placed at the bottom of the well screen. The top of the sump must be below the top of the confining layer. The sump must be deep enough to minimize silt accumulation in the screened interval and allow for sample collection. In order to allow for the locating and sampling of dense nonaqueous phased liquids (DNAPL's or sinkers), sumps must be set into the confining unit.

iv. Well screens may be continuous-slotted or wire-wrapped type, but must be constructed of materials which are manufactured as well screen.

Perforated types are generally not used in monitoring well construction. Slot size must be selected according to the size of the filter pack material and must minimize the introduction of fines into the well. Grain size analysis of the interval to be screened is recommended to make the determination of slot size. Screen lengths must be selected according to the intended use of the well and the interval to be monitored. The HWD will allow screens up to 15 feet in length to be used for the first zone of unconfined phreatic water. The screen must be set such that the screen is bisected by the static water level. This design allows for seasonal fluctuations across the screened interval and is suitable for the detection of light nonaqueous phased liquids (LNAPL's or floaters). This design is also suitable for situations which require monitoring at the interface of the water table and capillary fringe or vadose zone.

In most other cases, well screens of 10 feet or less are preferred. Special needs of site-specific conditions are determined on a case-by-case basis.

v. Well casing must be constructed of materials which are manufactured as well casing. All casing materials must form a water tight seal at the joints. Threaded joints are recommended. Solvent welded joints are not acceptable for monitoring wells. The casing, screen, etc. must be installed straight and plumb, such that sampling and water level equipment can be used without obstruction.

vi. Centralizers should be used to center the well in the borehole and keep the casing straight. Care must be taken in locating centralizers where they will not interfere with the placement of the sand pack, bentonite seal, or annular grout. Centralizers must not be placed within the bentonite seal.

vii. A filter pack must be used in the annulus around the well screen. The use of natural filter packs (allowing the collapse of the formation around the screened interval or driven well screen) is discouraged, but may be considered in certain situations. The filter pack must consist of chemically inert, well-graded, high silica sand that is the appropriate diameter for the screen selected. The filter pack must be placed utilizing a tremie pipe and/or tamping methods. The calculated filter pack volume and the volume of materials used must be recorded. The depth to the top of the filter pack must be measured and recorded. The top of the filter pack must extend approximately 2 feet above the top of the screen.

viii. All wells must have a bentonite seal immediately above the filter pack. This seal retards the movement of cement-based grout into the filter pack. The calculated volume and the volume of the sealant-material used must be recorded. The depth to the top of the bentonite seal must be recorded.

Bentonite must be powdered, granular, pelletized, or chipped sodium montmorillonite from a commercial source and free of impurities which could adversely affect groundwater quality. As a general rule, pellets or chips should be less than one fifth the width of the annular space to avoid bridging problems. If the bentonite pellet seal is being constructed above the water level, water from a known source and free of contamination must be poured into the annulus to hydrate the pellets prior to grouting the annulus. The bentonite seal must extend about 3-5 feet above the filter pack. An exception to this would be an extremely shallow well (i.e., less than 10 feet).

ix. The annulus of the well (diameter of the borehole) must be a minimum of 4 inches greater than the outside diameter of the casing and screen to allow proper placement of the filter pack, bentonite seal and annular grout.

x. All monitoring wells must have a cement base grout slurry placed from the bentonite seal to the ground surface in the annulus. The grout slurry must be placed using tremie methods or injected under pressure to avoid bridging. The cement must be one of the five Portland cement types specified in ASTM Specification C 150.

xi. All monitoring wells must be constructed with a surface seal. The surface seal must be installed on top of the grout seal and extend vertically up the well annulus between the well casing and the borehole to the land surface. Where appropriate, the lower end of the surface seal must extend at least one foot below the frost line in order to prevent damage from frost heaving. In aboveground well completions, the surface seal should form at least a two-feet wide, four-inch thick neat cement or concrete apron at the land surface. The apron must be constructed with a slight slope to drain surface water radially away from the well casing to prevent leakage down the outer casing.

xii. All monitoring wells must be constructed with a cap. Locking caps are recommended for all well locations to minimize the potential of tampering with the well. Flush-mounted wells must be fitted with a leak-proof cap to prevent surface water from entering the well bore and be designed such that surface water will not enter or stand on the installation. Ideally, the cover cap must also be leak-proof. If any well is artesian, the well cap must prevent uncontrolled discharges from the well.

xiii. The installation of protective equipment is recommended on all monitoring wells. Guard posts, locking well caps, protective covers, markers, signs, etc. are recommended by the HWD. The level of protection should meet the damage threat posed by the location of the well.

xiv. All wells must be properly developed upon completion and prior to sampling. Development serves to: a) remove the fine-grained material from the well screen and filter pack that may otherwise interfere with water quality analysis; b) restore the groundwater properties disturbed

during the drilling process; and c) improve the hydraulic characteristics of the filter pack and hydraulic communication between the well and the hydrogeologic unit adjacent to the well screen. Some common development methods include: mechanical surging, bailing, pumping, over-pumping, air-lift pumping, and jetting. As a general rule, the finer grained the hydrologic unit, the more gentle development method needed. The development method and development documentation data must be recorded. At a minimum, documentation of development must demonstrate that conditions are visibly free of turbidity and that pH and specific conductance readings are stable (within 10%) in at least four consecutive casing volumes. Optional quality assurance for well development may include turbidity measurements and hydraulic parameters which are obtained from pump tests and/or slug tests.

xv. All well locations must be surveyed to the nearest 0.1 feet horizontally (location) and to the nearest 0.01 feet vertically (elevation of the reference point that water levels are measured from). A surveyed reference point, for use as a measuring point, must be clearly marked and be placed on the top of the well casing, not on the protective casing or the well apron, because the well casing is more stable than the protective casing or well apron. The HWD prefers that the vertical reference point be given in reference to sea level, which in tum is established by reference to an established National Geodetic Vertical Datum (NGVD). All surveys must be certified by an Arkansas Licensed Land Surveyor.

xvi. A detailed construction log of the well is required. It must contain all of the well construction information previously discussed.

4. Plugging and Abandoning of Wells and Boreholes

a. The well casing must be removed from the borehole by pulling or drilling out.

b. All annular material (grout, bentonite seal, filter pack, etc.) must be removed from the borehole.

c. All boreholes (regardless of well construction) must be pressure-cemented back to the surface, utilizing a tremie pipe inserted to within two feet of the total depth of the borehole and a cement-bentonite grout circulated back to the ground surface. Any shrinkage or settlement of the grout must be remedied by filling the remaining void with additional cement-bentonite. The cement-bentonite mixture utilized is to be the same as described for annular grout in the Well Installation Procedures (Section 3.b.8.).

d. The minimum standards for plug and abandonment of any well or borehole are specified in AWWCC Rules and Regulations.

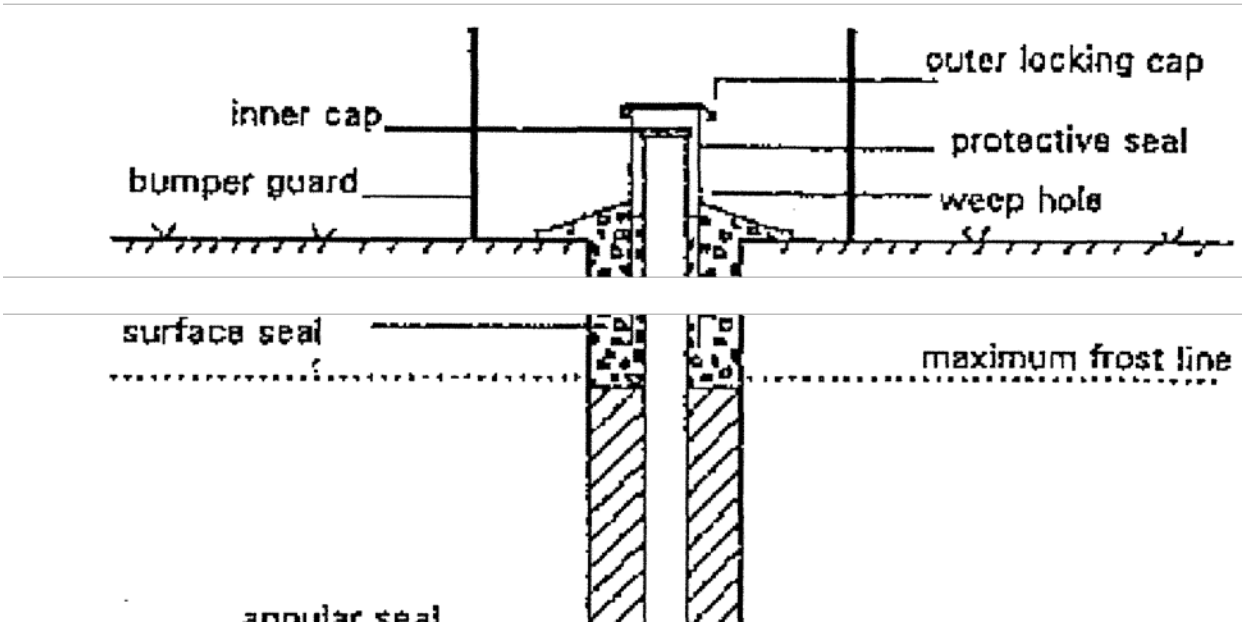
III. STATEMENT OF BASIS

The Arkansas Department of Environmental Quality (ADEQ) has prepared this document to provide a uniform and reliable reference of the preferred materials, procedures and practices for the construction and plugging and abandonment of groundwater monitoring systems and boreholes. Deviations from the use of procedures or materials described in this policy, without prior approval by ADEQ, may result in the work not being accepted.

HWD CHIEF	CHIEF COUNSEL	DEPUTY DIRECTOR
DEPUTY DIRECTOR	DEPUTY DIRECTOR	DIRECTOR

PERMIT ATTACHMENT XI- 3

Monitoring Well Construction Diagram



PERMIT ATTACHMENT XI-4

Groundwater Indicator Parameters and Constituents
(Austin Powder Co.)

A. CONTAMINANT INDICATOR PARAMETERS:

pH
Specific Conductance
Temperature (°C)
Total Organic Carbon (TOC)
Total Organic Halides (TOX)
Chloride

B. SITE-SPECIFIC CONSTITUENTS AND CONCENTRATION LIMITS:

Hazardous Constituent	Concentration Limit (mg/L)
Arsenic	0.05
Barium	1.0
Beryllium	0.002
Chromium	0.05
Cobalt	0.01
Copper	0.02
Lead	0.005
Nickel	0.05
Vanadium	0.010
Zinc	0.030
Acetone	0.050
Cyclotrimethylenetrinitramine (RDX)	0.0005
Pentaerythritol Tetranitrate (PETN)	0.0005
2,4,6-Trinitrotoluene (TNT)	0.0005
2-Nitrotoluene	0.0005
3-Nitrotoluene	0.0005
4-Nitrotoluene (4-NT)	0.0005
2,4-Dinitrotoluene	0.0005
2,6-Dinitrotoluene	0.0005
2-Amino-2,6-Dinitrotoluene	0.0005
4-Amino-2,6-Dinitrotoluene	0.0005
1,3,5-Trinitrobenzene	0.0005
1,3-Dinitrobenzene	0.0005
Nitrobenzene	0.0005
Tetryl	0.0005
HMX	0.0005

End of Module XI Attachments

MODULE XII(b)- SPECIAL CONDITIONS FOR CORRECTIVE ACTION RELATED TO SOLID WASTE MANAGEMENT UNITS

A. DEFINITIONS

For purposes of Module XII(b), the following definitions shall apply:

"**Area of Concern (AOC)**" means any area where an actual or potential release of hazardous waste, hazardous constituents, or hazardous substances, which is not from a solid waste management unit, is occurring and ADEQ determines to pose an actual or potential threat to human health or the environment.

"**Facility**" means all contiguous property under the control of the owner or operator seeking a permit under Subtitle C of RCRA and the Arkansas Hazardous Waste Management Act.

"**Hazardous Constituent**" means any constituent identified in Appendix VIII of APC&EC Regulation No. 23, Section 261, or any constituent identified in Appendix IX of APC&EC Regulation No. 23, Section 264.

"**Hazardous Substance**" means (A) any substance designated pursuant to Section 311(b)(2)(A) of the Federal Water Pollution Control Act (Public Law 92-500); any element, compound, mixture, solution, or substance designated pursuant to Section 102 of Title 1 of the federal Comprehensive Environmental Response, Compensation, and Liability Act of 1989 (Public Law 96-510); any hazardous waste, including polychlorinated biphenyls (PCBs), as defined by the Arkansas Hazardous Waste Management Act, as amended, §8-7-201 et seq., and the regulations promulgated thereunder; any toxic pollutant listed under Section 307(a) of the Federal Water Pollution Control Act; any hazardous air pollutant listed under Section 112 of the federal Clean Air Act; and any hazardous chemical substance or mixture regulated under Section 7 of the federal Toxic Substances Control Act; and (B) any other substance or pollutant designated by the Arkansas Hazardous Waste Management Act or by regulations of ADEQ.

"**Hazardous Waste**" means a hazardous waste as defined in APC&EC Regulation No. 23 §261.3.

"**Release**" means any spilling, leaking, pouring, emitting, emptying, discharging, injecting, pumping, escaping, leaching, dumping, or disposing of hazardous wastes (including hazardous constituents) into the environment (including the abandonment or discarding of barrels, containers, and other closed receptacles containing hazardous wastes or hazardous constituents).

"**Solid Waste Management Unit**" **(SWMU)** means any discernible unit at which solid wastes have been placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include, but are not limited to, any area at a facility at which solid wastes have been routinely and systematically released.

If, subsequent to the issuance of this Permit, these terms are redefined in promulgated regulations, the Director or designee may, at his discretion, apply the new definition to this permit.

B. STANDARD CONDITIONS

1. Section 3004(u) of RCRA, as amended by HSWA, and APC&EC Regulation No. 23 §264.101 require that permits issued after November 8, 1984, address

corrective action for releases of hazardous waste, hazardous constituents, or hazardous substances from any SWMU at the facility, regardless of when the waste was placed in the unit.

Section 3004 (v) of RCRA, as amended by HSWA, and APC&EC Regulation No. 23 §264.101 require corrective action beyond the facility boundary, where necessary to protect human health and the environment, unless the owner or operator 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.

2. Failure to submit the information required in Permit Module XII(b) or falsification of any submitted information is grounds for termination of this Permit (as provided by APC&EC Regulation No. 23 §270.43) or other actions. The Permittee shall ensure that all plans, reports, notifications, and other submissions to the Director or designee required in Permit Module XII(b) are signed and certified in accordance with APC&EC Regulation No. 23 §270.11. One (I) hardcopy and one (1) electronic copy of each of these plans, reports, notifications or other submissions shall be submitted by Certified Mail or hand delivered to:

   Senior Manager, Regulated Waste Operations
   Office of Land Resources
   Arkansas Department of Environmental Quality
   5301 Northshore Drive
   North Little Rock, AR 72218 -5317

3. All plans and schedules required by these conditions are, upon approval of the Director or designee, incorporated into this Permit by reference and become an enforceable part of this Permit. Any noncompliance with such approved plans and schedules shall be termed noncompliance with this Permit. Extensions of the due dates for submittals may be granted by the Director or designee in accordance with the permit modification process under APC&EC Regulation No. 23 §270.42.

   The required information under this permit shall include each item specified under RFI Tasks I-V and CMS Tasks VI-IX and CMI Tasks X-XIII. Since these required items are essential elements of this Permit, failure to submit any of these elements or submission of inadequate or insufficient information may subject the Permittee to enforcement action under Section 3008 of RCRA and the Arkansas Hazardous Waste Management Act which may include fines, suspension, or revocation of the permit.

   If the Director or designee determines that further actions beyond those provided in Permit Module XII(b) or changes to that which is stated herein, are warranted, the Director or designee may modify Permit Module XII(b) according to the permit modification processes under APC&EC Regulation No. 23 §270.41.

4. All raw data, such as laboratory reports, drilling logs, bench-scale or pilot-scale data, and other supporting information gathered or generated during activities undertaken pursuant to Permit Module XII(b) shall be maintained at the facility

until approved closure during the term of this Permit, including any reissued Permits.

5. For purposes of Permit Module XII(b), should the Permittee take exception to all or part of a disapproval or conditional approval of any plan or report required by this module, the Permittee may invoke the dispute resolution process outlined below:

   a. The Permittee and the Director or designee shall in good faith attempt to resolve expeditiously and informally all disputes or differences of opinion. If the parties are unable to informally resolve the dispute within ten (10) calendar days of the receipt of the disapproval decision or directive which is the subject of dispute, the Permittee shall provide written notice to the Director or designee of the invocation of dispute resolution. The Permittee shall provide the written notice no later than the twentieth (20th) calendar day after receipt of the disapproval decision or directive. The notice shall set forth the specific points of the dispute, the position the Permittee is maintaining should be adopted as consistent with the Permit's requirements, the basis therefore, and any matters which it considers necessary for the Director or designee's proper determination. Within ten (10) calendar days of receipt of the written notice, the Director or designee will provide to the Permittee a written statement of the Director or designee's decision on the pending dispute, which shall be incorporated into the final Permit unless the Permittee requests an opportunity for a conference in accordance with Paragraph b. of this section. The existence of a dispute as defined herein, and the consideration of such matters which are placed into dispute shall not excuse, toll or suspend any compliance obligation or deadline not in dispute during the pending dispute resolution process including continuance of Module XII(b) work not otherwise dependent on the dispute at hand.

   b. If the Permittee objects to any determination by the Director or designee regarding the disputed issue(s), the Permittee shall within ten (10) calendar days of its receipt of the Director or designee's decision pursuant to Paragraph a. of this section, notify the Director or designee in writing of its objections and may request the Director or designee to convene an informal conference for the purpose of discussing the Permittee's objections and the reasons for the Director or designee's determination. After this conference, the Director or designee will state in writing his decision regarding the factual issues in dispute. Such decision shall be the final resolution of the dispute and shall be implemented by the Permittee in accordance with the schedule contained in the final decision.

C. REPORTING REQUIREMENTS

1. The Permittee shall submit to the Director or designee signed semi-annual progress reports of all activities (e.g., SWMU Assessment, Interim Measures, RCRA Facility Investigation, Corrective Measures Study, Corrective Measures Implementation) conducted pursuant to the provisions of Permit Module XII(b)

beginning no later than ninety (90) calendar days from the effective date of this Permit. These reports shall contain:

a. A description of the work completed;

b. Summaries of all findings, including summaries of laboratory data;

c. Summaries of all problems or potential problems encountered during the reporting period and actions taken to rectify problems; and

d. Projected work for the next reporting period.

2. Copies of other reports (e.g., inspection reports), drilling logs, and laboratory data shall be made available to the Director or designee upon request.

3. As specified under Permit Module XII(b), Conditions F and G, the Director or designee may require the Permittee to conduct new or more extensive assessments, investigations, or studies, as needed, based on information provided in these progress reports or other supporting information.

D. NOTIFICATION REQUIREMENTS FOR AND ASSESSMENT OF NEWLY-IDENTIFIED SOLID WASTE MANAGEMENT UNIT(S) (SWMUS)

1. The Permittee shall notify the Director or designee, in writing, of any newly-identified SWMU(s) (i.e., a SWMU or potential SWMU not specifically identified within this Permit or the Part B Application). This notification must be submitted no later than fifteen (15) calendar days after discovery. The notification shall include the following items, to the extent available:

a. The location of the newly-identified SWMU in relation to other SWMUs;

b. The type and function of the unit;

c. The general dimensions, capacities, and structural description of the unit (supply available drawings);

d. The period during which the unit was operated;

e. The specifics on wastes that have been or are being managed at the SWMU, to the extent available; and

f. The results of any sampling and analysis required for the purpose of determining whether releases of hazardous wastes, including hazardous substances, have occurred, are occurring, or are likely to occur from this unit.

2. Based on the results of this Notification, the Director or designee will determine the need for further investigations or corrective measures at any newly-identified SWMU(s) covered in the Notification. If the Director or designee determines that such investigations are needed, the Director or designee may require the Permittee to prepare a plan for such investigations. This plan will be reviewed for approval as an RFI Work plan under Permit Module XII(b), Condition H., RFI Report and Summary, and, where possible, any previously approved RFI Work plan should be modified as necessary and adopted for use for newly identified SWMUs in order to expedite the work.

E. NOTIFICATION REQUIREMENTS FOR NEWLY-DISCOVERED RELEASES AT SWMU(S)

The Permittee shall notify the Director or designee, in writing, of any release(s) of hazardous waste or hazardous substances discovered during the course of ground water monitoring, field investigation, environmental auditing, or other activities undertaken after the commencement of the RFI, no later than fifteen (15) calendar days after discovery. Such newly-discovered releases may be from newly-identified units, from units for which, based on the findings of the RFA, the Director or designee has previously determined that no further investigation was necessary, or from units investigated or discovered as part of RFI. The Director or designee may require further investigation and Interim Measures for the newly-identified release(s).

F. DESCRIPTION OF CURRENT CONDITIONS REPORT (DOCC) AND RCRA FACILITY INVESTIGATION (RFI) WORK PLAN

1. The Permittee submitted in November 2004 to ADEQ a Description of Current Conditions Report (DOCC) describing the current conditions at the facility as outlined in the RFI Scope of Work, Permit Module XII(b), Condition Q., Scope of Work for a RFI, Task I. This Report may be limited to information not in the Part B Application or to recent information not addressed in the RCRA Facility Assessment (RFA). Any previously submitted information shall be referenced and summarized as appropriate to completely detail the current conditions at the facility. Results of any previous investigations and any other investigations required by state or local authorities may be included in this DOCC if they address any of the requirements of this Permit. The DOCC shall address the background information pertinent to the facility and the nature and extent of contamination.

2. The DOCC shall identify all areas of potential interim measures which may be necessary to protect human health and the environment with proposed schedule of implementation.

Previous Description of Current Conditions:
Submitted: November 2004
Approved: September 2005

3. The Permittee submitted in August 2005 to ADEQ for review and approval an RFI Work plan as outlined in Permit Module XII(b), Condition Q, Task II. The RFI Work plan must address those units, releases of hazardous waste containing hazardous substances, and media of concern which, based on the results of the RFA or other information, require further investigation. The RFI Work plan shall be the implementing document for the work outlined in Permit Module XII(b), Condition Q, Tasks III and IV. The scope of the RFI shall include, but not be limited to, the SWMU's listed in Table 1, and potential releases to all media. The SWMU's are to be investigated to determine the necessity of corrective action. The RFI Work plan must include a concise schedule for completing the Task III and IV work and require the RFI Report in no more than sixty (60) calendar days after completion of Tasks III and IV. An interim RFI Report can be required by the Director or designee as soon as sufficient information is available for the most

significant units which will obviously require corrective action in order to protect human health and the environment.

Table 1. Solid Waste Management Units

SWMU#	SWMU Description
1	Open Burn/Open Detonation (OB/OD) Area
2	Two Enclosed Water Recycling Systems
3	Two Portable Wastewater Tanks
4	Two Waste Accumulation Points
5	Four Old Catch Tanks and Basin Water System
6	Septic Tank System

a. The RFI Work Plan shall describe the objectives of the investigation and the overall technical and analytical approach to completing all actions necessary to characterize the nature, direction, rate, movement, and concentration of releases of hazardous waste including hazardous substances from specific units or groups of units, and their actual or potential receptors. The RFI Work Plan shall detail all proposed activities and procedures to be conducted at the facility, the schedule for implementing and completing such investigations, the qualifications of personnel performing or directing the investigations, including contractor personnel, and the overall management of the RFI. The Scope of Work for a RFI is outlined in Condition Q. of this module.

b. The RFI Work Plan shall discuss sampling and data collection quality assurance and data management procedures, including formats for documenting and tracking data and other results of investigations, and health and safety procedures.

c. The RFI Work Plan shall include a plan for further developing any existing site-wide monitoring well network. If the Director or designee determines based on the DOCC or the RFA report that ground water contamination is likely, the Director or designee may require the Permittee to submit a ground water monitoring plan in the RFI Work Plan. The plan shall include:

   i. A review of all known past or present Solid Waste Management Units and all known spills;

   ii. A review of any existing ground water monitoring well network;

   iii. A plan and implementation schedule for plugging and abandoning any monitoring wells that are determined not to be useful in a site-wide well network;

   iv. A plan and implementation schedule for installing such additional monitoring wells as may be needed to complete the proposed site-wide well network for the aquifer above the confining zone.

4. After the Permittee submits the RFI Work Plan, the Director or designee will approve, disapprove, or modify the RFI Work Plan in writing. If the Director or

designee approves the plan, the Permittee shall immediately initiate implementation of the plan according to the schedule contained therein. All approved work plans become incorporated into this Permit.

In the event of disapproval (in whole or in part) of the plan, the Director or designee will specify any plan deficiencies in writing. The Permittee shall modify the plan to correct these within thirty (30) calendar days of receipt of the disapproval by the Director or designee. The modified plan shall be submitted in writing to the Director or designee for review. Should the Permittee take exception to all or part of the disapproval, the Permittee may invoke dispute resolution as outlined by Permit Module XII(b), Condition B.5., above. Where appropriate, all other work not subject to dispute resolution may be specified by the Director or designee to proceed independent of the dispute process. If necessary to accomplish matters of noted deficiencies or of dispute resolution, the Director or designee will make further modifications as required.

If the Director or designee modifies the plan, this modified plan becomes the approved RFI Work Plan. If the modified plan is not the result of dispute resolution but is modified due to Director or designee review, the modified plan is also subject to the dispute resolution rights of the Permittee as described above. The Permittee shall immediately initiate implementation of the approved RFI Work Plan according to the schedule contained therein.

5. The Director or designee shall review for approval, as supplements to the RFI Work Plan, any plans developed pursuant to Permit Module XII(b), Condition D., addressing further investigations of newly-identified SWMUs or new releases from previously-identified units. In the event that the RFI Work Plan and supplements do not call for applicable work of Permit Module XII(b), Condition Q., Tasks 11-V, the requirements of Condition Q., Tasks 11-V must be met. The RFI Work Plan must include a concise schedule for completing the Tasks III and IV work and require the RFI Report within sixty (60) calendar days of Tasks III and IV work completion.

Previous RCRA Facility Investigation Work Plans Received:

Submitted: August 2005
Approved: June 2006
Submitted: August 2009 (an initial RFI Work Plan for new SWMU #6)
Approved: October 2009

G. RFI WORK PLAN IMPLEMENTATION

Upon receipt of written approval from the Director or designee for the RFI Work Plan, the Permittee shall begin implementation of the RFI according to the Schedules specified in the approved or modified RFI Work Plan. The RFI shall be conducted in accordance with the approved RFI Work Plan and accomplish all appropriate work outlined in Permit Module XII(b), Condition Q., Tasks III and IV. The Permittee shall implement the RFI Work Plan and undertake the facility investigation in accordance with the following:

1. Development of the RFI Work Plan and reporting of data shall be consistent with the RCRA Facility Investigation Guidance Document (OSWER Directive

9502.00-6 (D)) May 1989 or the equivalent thereof;

2. ADEQ reserves the right to split samples. The Permittee shall notify ADEQ at least ten (10) calendar days prior to any sampling activity;

3. When developing ground water related investigations, the Permittee shall follow the RCRA Groundwater Monitoring Technical Enforcement Guidance Document (EPA OSWER Directive 9950-1, September 1986) or the equivalent thereof, to determine methods and materials that are acceptable to ADEQ;

4. Any major deviations from the approved RFI Work Plan which are necessary during implementation of the investigations must be approved by the Director or designee and fully documented and described in the progress reports and in the RFI Report.

H. RFI REPORT AND SUMMARY

1. The Permittee submitted an RFI Report on May 31, 2007. The RFI Report shall describe the procedures, methods, and results of all investigations of SWMUs and their releases, including information on the type and extent of contamination at the facility, sources and migration pathways, and actual or potential receptors. The RFI Report shall present all information gathered under the approved RFI Work Plan, and include an investigative analysis as described under Permit Module XII(b), Condition Q., Task IV. The Report must contain adequate information to support corrective action studies at the facility to eventually implement a remedy if necessary.

2. After the Permittee submits the RFI Report, the Director or designee shall either approve or disapprove the Report in writing.

   If the Director or designee approves the RFI Report, the Permittee shall mail a notice that the RFI Report has been approved to all individuals on the facility mailing list established pursuant to 40 CFR 124.10(c)(1)(ix), within fifteen (15) calendar days of receipt of approval. This notice shall indicate where a copy of the report can be found and who to contact for more information.

   If the Director or designee determines the RFI Final Report does not fully detail the objectives stated under Permit Module XII(b), Condition Q., the Director or designee may disapprove the RFI Report. If the Director or designee disapproves the Report, the Director or designee will notify the Permittee in writing of the Report's deficiencies and specify a due date for submittal of a revised Final Report. Once approved, the Permittee shall mail a notice that the RFI Report has been approved to all individuals on the facility mailing list as specified above.

   If the Director or designee determines the RFI Final Report fulfills the requirements of the RFI Work Plan, but that additional information or data is required, the Director or designee may require the Permittee to conduct additional investigations as necessary. In addition, the RFI Report may be used by the Director or designee to implement specific interim measures as necessary to protect the public health and the environment. Failure to properly implement the RFI Work Plan and resulting in an unapprovable RFI Report may subject the Permittee to enforcement action and should not relieve the Permittee of the

responsibility to implement partial CMS Tasks VI through IX work as directed or interim measures stipulated by the Director or designee as necessary to protect human health and the environment.

Previous RFI Reports Received:

Submitted: May 31, 2007 {Initial)
Approved: October 19, 2009 (Initial)
Submitted: January 2010 (for SWMU #6)
Approved: March 2010 (for SWMU #6)
Submitted: February 2011 (Addendum)
Approved: May 18, 2011 (Addendum)

I. INTERIM MEASURES

This condition is to provide for unforeseen interim measures that may arise after permit issuance. The interim measures Appendices A - E apply to work under this condition as applicable, as guidance for interim measures outside the normal RFI/CMS process.

1. If during the course of any activity initiated under Permit Module XII(b), the Director or designee determines that a release or potential release of hazardous substances from a SWMU poses a threat to human health and the environment, the Director or designee may specify corrective action interim measures. The Director or designee may determine the specific measure, including potential permit modifications and the schedule for implementing the required measures which may forego RFI and CMS tasks as appropriate. The Director or designee will notify the Permittee in writing of the requirement to perform such interim measures. The Director or designee may modify Permit Module XII(b) according to the permit modification procedures under APC&EC Regulation No. 23 §270.41, to incorporate such interim measures into the Permit, but actual implementation can begin immediately for the goal of protecting human health and the environment.

2. The following factors will be considered by the Director or designee in determining the need for interim measures:

    a. time required to develop and implement a final remedy;

    b. actual and potential exposure to human and environmental receptors;

    c. actual and potential contamination of drinking water supplies and sensitive ecosystems;

    d. the potential for further degradation of the medium absent interim measures;

    e. presence of hazardous waste in containers that may pose a threat of release;

    f. presence and concentration of hazardous wastes, including hazardous substances, in soil that have the potential to migrate to ground water or surface water;

    g. weather conditions that may affect the current levels of contamination;

h. risks of fire, explosion, or accident; and

i. other situations that may pose threats to human health and the environment.

J. DETERMINATION OF NO FURTHER ACTION (NFA)

1. Based on the results of the RFI and other relevant information, the Permittee may submit an application to the Director or designee for a Class 3 permit modification under APC&EC Regulation No. 23 §270.42(c) to terminate the RFIICMS process for a specific unit or units. This permit modification application must contain information demonstrating that there are no releases of hazardous wastes or hazardous substances from a particular SWMU at the facility that poses a threat to human health and the environment, as well as information required in APC&EC Regulation No. 23 §270.42(c), which incorporates by reference APC&EC Regulation No. 23 §270.13 through §270.21, §270.26, and §270.63.

   If, based upon review of the Permittee's request for a permit modification, the results of the RFI, and other information, including comments received during the sixty (60) day public comment period required for Class 3 permit modifications, the Director or designee determines that releases or suspected releases which were investigated either are non-existent or do not pose a threat to human health and the environment, the Director or designee may grant the requested modification.

2. A determination of no further action shall not preclude the Director or designee from requiring continued or periodic monitoring of air, soil, ground water, or surface water, when site-specific circumstances indicate that release of hazardous wastes including hazardous substances are likely to occur, and as necessary to protect human health and the environment.

3. A determination of no further action shall not preclude the Director or designee from requiring further investigations, studies, or remediation at a later date, if new information or subsequent analysis indicates a release or likelihood of a release from a SWMU at the facility that is likely to pose a threat to human health or the environment. In such a case, the Director or designee may initiate a Class 3 permit modification according to APC&EC Regulation No. 23 §270.41, to rescind the determination made in accordance with Permit Module XII(b), Condition J.

K. CORRECTIVE MEASURES STUDY (CMS) PLAN

1. If, after review of the RFI Report, the Director or designee has reason to believe that a SWMU has released concentrations of hazardous substances, or if the Director or designee determines that contaminants present a threat to human health and the environment given site-specific exposure conditions, the Director or designee may require a CMS and shall notify the Permittee in writing. The notification may also specify remedial alternatives to be evaluated by the Permittee during the CMS.

2. The Permittee shall submit a CMS Plan to the Director or designee within sixty (60) calendar days from notification of the requirement to conduct a CMS. The CMS Plan will be as necessary to implement the CMS, Tasks VI-IX as described

in Permit Module XII(b), Condition R. The CMS Plan shall provide the following information:

a. a description of the general approach to investigation and potential remedies;

b. a definition of the overall objectives of the study;

c. the specific plans for evaluating remedies to ensure compliance with remedy standards;

d. the schedule for conducting the study;

e. the proposed format for the presentation of information; and

f. a schedule for completion of the CMS Tasks VII-IX.

3. After the Permittee submits the CMS Plan, the Director or designee will either approve or disapprove the Plan. If the Plan is not approved, the Director or designee will notify the Permittee in writing of the Plan's deficiencies and specify a due date for submittal of the revised Plan. If this Plan is not approved, the Director or designee may revise the Plan and notify the Permittee of the revisions. The Director or designee revised Plan becomes the approved Plan.

L. CORRECTIVE MEASURES STUDY (CMS)

No later than fifteen (15) calendar days after the Permittee has received written approval from the Director or designee for the CMS Plan, the Permittee shall begin to implement the CMS according to the schedules specified in the CMS Plan. The CMS shall be conducted in accordance with the approved Plan and as necessary to satisfy the requirements of Permit Module XII(b), Condition R., Scope of Work for a CMS, Tasks VII and VIII, sufficient to prepare an approvable CMS Report (Task IX of Condition R.).

M. CMS REPORT AND DRAFT REMEDIAL ACTION DECISION DOCUMENT (RADD)

1. Within sixty (60) calendar days after the completion of the CMS, the Permittee shall submit a CMS Report. The CMS Report shall summarize the results of the investigations for each remedy studied and of any bench-scale or pilot tests conducted. The CMS Report must include an evaluation of each remedial alternative. The CMS Report shall present all information gathered under the approved CMS Plan. The report must contain adequate information to support the Director or designee in the remedy selection decision-making process and shall be sufficient for concise remedy selection and design without further investigation or study.

2. If the Director or designee determines that the CMS Report does not fully satisfy the information requirements specified under Permit Module XII(b), Condition R., the Director or designee may disapprove the CMS Report. If the Director or designee disapproves the Report, the Director or designee shall notify the Permittee in writing of deficiencies in the report and specify a due date for submittal of a revised CMS Report. If this revised report is not approved, the Director or designee may revise the report as necessary to require specific

corrective actions and notify the Permittee of the revisions.

Failure to properly implement the CMS Plan and resulting in an unapprovable CMS Report may subject the Permittee to enforcement action and shall not relieve the Permittee of the responsibility to implement partial CMI Tasks X through XIII work as directed by the Director or designee as necessary to protect human health and the environment.

3. A schedule for implementation of all corrective measures designs and construction must be included and shall address interim measures as appropriate. The Director or designee may implement corrective action interim measures as necessary to protect human health and the environment.

4. As part of the Director or designee's review and approval/disapproval of the CMS, he will choose the particular remedy for each unit or group of units and he can concur with the Permittee's selected remedy or he can choose another remedy, or combination of remedies, as appropriately justified. This shall be accomplished through a Draft RADD as described in Permit Module XII(b), Condition R., Task IX.C. The Draft RADD shall be subject to public comment as described in the following paragraph:

   The Director or designee shall prepare a thirty (30) day Public Notice to solicit public comments on the CMS Report and the Corrective Measure selection through the Draft RADD. The Director or designee will consider the public comments as set out in the Draft RADD prior to approval of the CMS Report and corrective measure(s) for preparing a Final RADD. The Permittee shall bear the cost of the Public Notice. The CMS Report revised by the Director or designee becomes the approved Report.

5. Based on the comments from the Public Notice for the RADD, the Director or designee may require the Permittee to evaluate additional remedies or particular elements of one or more proposed remedies.

6. Based on the CMS Report and the comments from the public for the RADD, the Director or designee will then develop the Final RADD which will approve the CMS phase, as modified, and will become the controlling document for all Corrective Measures Implementation and resulting Corrective Measures Designs.

N. CORRECTIVE MEASURES IMPLEMENTATION AND FINAL RADD

1. The Draft RADD shall include a proposed schedule for implementing the corrective measures design and construction as set by the CMS work or by the Director or designee through modifications of the CMS Report. It shall be finalized based on public comments and must be implemented within fifteen (15) calendar days of the Director or designee's notification of the Final RADD and final approval of the CMS Report as modified for the Final RADD.

2. The Corrective Measures Implementation (CMI) must be carried out to meet the requirements of Permit Module XII(b), Condition S., Tasks X-XIII, and to comply with the Final RADD.

Previous Remedial Action Decision Documents:

Approved: August 31, 2011

O. MODIFICATION OF THE PERMIT

1. If at any time the Director or designee determines that modification of Permit Module XII(b) is necessary, a modification may be initiated according to the procedures of APC&EC Regulation No. 23 §270.41 and §270.42.

2. Modifications to Permit Module XII(b) do not constitute a reissuance of the permit.

P. RFI/CMS SUBMISSION SUMMARY

Below is a summary of the planned reporting requirements pursuant to Permit Module XII(b): (See Conditions Q. and R. for Detailed RFI/CMS Work)

Actions	**Due Date (All days are calendar days)**
Notification of newly- discovered SWMUs or newly discovered releases	15 days after discovery
Progress reports on all activities	Semi-annually
Description of Current Conditions Report	Submitted November 2004 Approved September 2005
RFI Work Plan for SWMU(s) identified at time of permit issuance	Submitted August 2005 (Initial) Approved June 2006 (Initial) Submitted August 2009 (for SWMU #6) Approved October 2009 (for SWMU #6)
RFI Work Plan for SWMU(s) identified after effective date of permit	15 days after discovery
RFI Reports	Submitted May 31, 2007 (Initial) Approved October 19, 2009 (Initial) Submitted January 2010 (for SWMU #6) Approved March 2010 (for SWMU #6) Submitted February 2011 (Addendum) Approved May 18,2011 (Addendum)
Interim Measures Plan for interim measures required after permit issuance	30 days after notification
CMS Plan (Task VI)	60 days after notification of requirement to perform CMS
CMS (Tasks VII and VIII)	As detailed in schedule in CMS Plan
CMS Report (Task IX)	60 days after completion of CMS VII & VIII

Actions	Due Date (All days are calendar days)
Demonstration of Financial Assurance for Selected Remedy	120 days after permit modification for remedy

Q. SCOPE OF WORK FOR A RFI

PURPOSE

The purpose of a RFI is to determine the nature and extent of releases of hazardous waste or hazardous substances from SWMUs. This process shall begin upon issuance of this permit, and may also be invoked upon the notification of the Director or designee by the Permittee of the discovery of newly identified SWMUs or releases from SWMUs. The Director or designee may require implementation of corrective action interim measures at any time as necessary to protect human health and the environment which may forego the detailed RFI/CMS Tasks I through VIII as appropriate and as approved or stipulated by the Director or designee. The Permittee shall furnish all personnel, materials, and services necessary for, or incidental to, performing the RFI. If the Permittee believes that certain requirements of the Scope of Work are not applicable, the specific requirements shall be identified and the rationale for inapplicability shall be provided.

SCOPE

The RFI consists of five tasks:

Task I: DOCC

- A. Facility Background
- B. Nature and Extent of Contamination

Task II: RFI Work Plan

- A. Data Collection Quality Assurance Plan
- B. Data Management Plan
- C. Health and Safety Plan
- D. Community Relations Plan
- E. Project Management Plan

Task III: Facility Investigation

- A. Environmental Setting
- B. Source Characterization
- C. Contamination Characterization
- D. Potential Receptor Identification

Task IV: Investigative Analysis

- A. Data Analysis
- B. Protection Standards

Task V: Reports:

A. DOCC and Work Plan

B. Progress

C. RFI Report

The required information shall include each item specified under RFI Tasks 1-V. Since these required items are essential elements of this Permit, failure to submit any of these elements or submission of inadequate or insufficient information may subject Permittee to enforcement action under Section 3008 of RCRA and the Arkansas Hazardous Waste Management Act which may include fines, suspension, or revocation of the permit.

TASK I: DESCRIPTION OF CURRENT CONDITIONS (DOCC)

The Permittee shall submit to the Director or designee a DOCC providing the background information pertinent to the facility, contamination, and any type of on-going corrective action as set forth below. This report may be limited to information not in the Part B Application or to recent information not addressed in the RFA.

A. Facility Background

The report shall summarize the regional location, pertinent boundary features, general facility physiography, hydrogeology, and historical use of the facility for the treatment, storage or disposal of solid and hazardous waste. Information from existing reports and studies is acceptable for any requirement in this Permit, as long as the source of this information is documented and it is pertinent and reflective of current conditions, and meets the format for the RFI investigations. The report shall include:

1. Map(s) depicting the following:
    a. general geographic location;
    b. property lines, with the owners of all adjacent property clearly indicated;
    c. topography, waterways, all wetlands, floodplains, water features, drainage patterns;
    d. all solid waste management units;
    e. all known past solid or hazardous waste treatment, storage, and disposal areas regardless of whether they were active on November 19, 1980;
    f. surrounding land uses (residential, commercial, agricultural, recreational); and
    g. the location of all production and ground water monitoring wells. These wells shall be clearly labeled and ground and top of casing elevations included (these elevations may be included as an attachment).

    All maps shall be of sufficient detail and accuracy to locate and report all current and future work performed at the site. The maps shall comply with the requirements of APC&EC Regulation No. 23 §270.14(b)(19).
2. A history and description of ownership and operation, solid and hazardous waste generation, treatment, storage, and disposal activities at the facility.
3. Approximate dates or periods of past waste spills, identification of the materials spilled, the amount spilled, the location where spilled, and a description of the response actions conducted (local, State, or Federal response units or private parties), including any inspection reports or technical reports generated as a result of the response.
4. Documentation of all interim measures which were or are being undertaken at the facility other than those specified in this permit.
5. A reference of all environmental, geologic, and hydrogeologic studies performed by all parties, at or near the facility, with a short summary of purpose, scope, and

significant findings thereof.

6. A reference of all environmental permits, applied for and received, the purpose thereof, and a short summary of requirements except for the provisions of this permit.

B. Nature and Extent of Contamination

The Permittee shall include in the DOCC the existing information on the nature and extent of contamination.

1. The Permittee's report shall summarize all possible source areas of contamination, including all solid waste management units. For each area, the Permittee shall identify the following:

   a. location of unit/area (which shall be depicted on a facility map);

   b. quantities of solid and hazardous wastes;

   c. hazardous waste, mixture of radioactive/hazardous wastes, and hazardous substances, to the extent known; and

   d. identification of areas where additional information is necessary.

2. The Permittee shall prepare an assessment and description of the existing degree and extent of contamination. This should include:

   a. available monitoring data and qualitative information on locations and levels of contamination at the facility;

   b. all potential migration pathways including information on geology, pedology, hydrogeology, physiography, hydrology, water quality, meteorology, and air quality; and

   c. the potential impact(s) on human health and the environment, including demography, ground water and surface water use, and land use.

C. Current and Past Interim Measures

The Permittee shall document and report on all interim measures taken which were or are being undertaken at the facility other than those specified in the Permit. This shall include:

1. objectives of the interim measures (how the measure is mitigating a potential threat to human health and the environment and is consistent with and integrated into any long term solution at the facility);

2. design, construction, operation, and maintenance requirements;

3. schedules for design, construction, and monitoring; and

4. schedule for progress reports.

TASK II: RFI WORK PLAN REQUIREMENTS

The Permittee shall prepare an RFI Work Plan to investigate all SWMUs identified in Permit Module XII(b), Condition F.3., DOCC and RFI Work Plan, Table 1, as well as any newly identified SWMU's contained in the DOCC or for which the Permittee has notified the Director or designee. This RFI Work Plan shall include the development of several plans, which shall be prepared concurrently. During the RFI, it may be necessary to revise the RFI Work Plan to increase or decrease the detail of information collected to accommodate the facility specific situation. The RFI Work Plan shall include the following:

A. Data Collection Quality Assurance Plan

The Permittee shall prepare a plan to document all monitoring procedures: sampling, field measurements, and sample analysis performed at the facility during the investigation to characterize the environmental setting, source, and contamination, so as to ensure that all information, data, and resulting decisions are technically sound, statistically valid, and properly documented.

1. Data Collection Strategy

   The strategy section of the Data Collection Quality Assurance Plan shall include but not be limited to the following:

   a. description of the intended uses for the data, and the necessary level of precision and accuracy for these intended uses;

   b. description of methods and procedures to be used to assess the precision, accuracy and completeness of the measurement data;

2. Sampling and Field Measurements

   The Sampling and Field Measurements Section of the Data Collection Quality Assurance Plan shall at least discuss:

   a. selecting appropriate sampling and field measurements locations, depths, etc.;

   b. providing a statistically sufficient number of sampling and field measurement sites;

   c. determining conditions under which sampling or field measurements should be conducted;

   d. determining which parameters are to be measured and where;

   e. selecting the frequency of sampling and length of sampling period;

   f. selecting the types of sample (e.g., composites vs. grabs) and number of samples to be collected;

   g. measures to be taken to prevent contamination of sampling or field measurements equipment and cross contamination between sampling points;

   h. documenting field sampling operations and procedures;

   i. selecting appropriate sample containers;

j. sample preservation; and

k. chain-of-custody.

3. The Sample Analysis shall include:

a. chain-of-custody procedures;

b. sample storage procedures and holding times;

c. sample preparation methods;

d. analytical procedures;

e. calibration procedures and frequency;

f. data reduction, validation and reporting; and

g. internal quality control checks, laboratory performance and systems audits and frequency.

B. 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, such as:

1. Data Record;

2. Tabular Displays; and

3. Graphical Displays.

C. Health and Safety Plan

The Permittee shall prepare a facility Health and Safety Plan.

1. Major elements of the Health and Safety Plan shall include:

a. facility description including availability of resources such as roads, water supply, electricity and telephone service;

b. a description of the known hazards and evaluation of the risks associated with the incident and with each activity conducted;

c. list of key personnel and alternatives responsible for site safety, responses operations, and for protection of public health;

d. delineation of work areas;

e. description of levels of protection to be worn by personnel in each work area;

f. establishment of procedures to control site access;

g. description of decontamination procedures for personnel and equipment;

h. establishment of site emergency procedures;

i. plan of emergency medical care for injuries and toxicological problems;

j. description of requirements for an environmental field monitoring program;

k. specification for any routine and special training required for responders;

l. establishment of procedures for protecting workers from weather-related problems;

m. Description of emission control equipment; and

n. Description of air monitoring during activities which may expose workers to air contaminants.

2. The Facility Health and Safety Plan shall be consistent with:

a. NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985);

b. EPA Order 1440.1 -Respiratory Protection;

c. EPA Order 1440.3- Health and Safety Requirements for Employees engaged in Field Activities;

d. approved Hazardous Waste Facility Contingency Plan;

e. EPA Operating Safety Guide (1984);

f. OSHA regulations particularly in 29 CFR 1910 and 1926;

g. State and local regulations; and

h. other EPA guidance as provided.

D. Community Relations Plan

The Permittee shall prepare a plan for the dissemination of information to the public regarding investigation activities and results.

E. Project Management Plan

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

TASK III: FACILITY INVESTIGATION

The Permittee shall conduct investigations of all SWMUs in accordance with the approved RFI Work Plan. The investigations shall be conducted in a manner protective of human health and the environment, and shall: characterize the facility (Environmental Setting); define the source (Source Characterization); define the degree and extent of contamination (Contamination Characterization); and identify actual or potential receptors.

Investigations should result in data of adequate technical quality to support the development and evaluation of the corrective measure alternative or alternatives during the Corrective Measures Study, when necessary.

Any facility investigation activities shall follow the plans set forth in Task II. All sampling and analyses shall be conducted in accordance with the Data Collection Quality Assurance 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 verify existing information on the environmental setting at the facility. The Permittee shall characterize the following:

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 SWMU specific geologic and hydrogeologic characteristics affecting ground water flow beneath the facility;

b. an analysis of any topographic features that might influence the ground water flow system (Note: Stereographic analysis of aerial photographs may aid in this analysis);

c. based on field data, tests, (e.g., gamma and neutron logging of existing and new wells, piezometers and borings) 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);

d. based on field studies and cores, structural geology and hydrogeologic cross sections showing the extent (depth, thickness, lateral extent) of hydrogeologic units which may be part of the migration pathways identifying:

i. unconsolidated sand and gravel deposits;

ii. zones of fracturing or channeling in consolidated or unconsolidated deposits; and

iii. zones of high permeability or low permeability that might direct and restrict the flow of contaminants.

e. based on data obtained from ground water monitoring wells and piezometers installed upgradient and downgradient of the potential

contaminant source, a representative description of water level or fluid pressure monitoring; and

f. a description of man-made influences that may affect the hydrogeology of the site.

2. Soils

The Permittee shall conduct a program to characterize the soil and rock units above the water table in the vicinity of the contaminant release(s). Such characterization shall include, but not be limited to, the following information:

a. surface soil distribution;

b. soil profile, including ASTM classification of soils;

c. transects of soil stratigraphy;

d. saturated hydraulic conductivity;

e. porosity;

f. cation exchange capacity (CEC);

g. soil pH;

h. particle size distribution;

i. depth of water table;

j. moisture content;

k. effect of stratification on unsaturated flow;

l. infiltration;

m. evapotranspiration;

n. residual concentration of contaminants in soil; and

o. mineral and metal content.

B. Source Characterization

The Permittee shall collect analytical data to completely characterize the wastes and the areas where wastes have been placed, including: type, quantity, physical form, disposition (containment or nature of deposits), and the facility characteristics affecting release (e.g., facility security, and engineered 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;

h. method used to close the unit/disposal area;

2. Waste Characteristics:

a. type of waste placed in unit;

b. physical and chemical characteristics; and

c. migration and dispersal characteristics of the waste.

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

C. Contamination Characteristics

The Permittee shall collect analytical data on ground water, soils, surface water, sediment, and subsurface gas contamination when necessary to characterize contamination from a SWMU. This data shall be sufficient to define the extent, origin, direction, and rate of movement of contaminant plumes. Data shall include time and location of sampling, media sampled, concentrations found, conditions during sampling, and the identity of the individual(s) performing the sampling and analysis. Each media (ground water, surface water, soil, air, and gas) must be investigated. If the Permittee believes certain media could not be affected by a release from a specific unit, a detailed justification for not investigating that media must be provided. The Permittee shall address the following types of contamination at the facility:

1. Ground Water Contamination

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

a. a description of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from 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 any Appendix IX constituents;

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 water table in the vicinity of the contaminant release. The investigation shall include the following information:

a. a description of the vertical and horizontal extent of contamination;

b. a description of contaminant and soil chemical properties within the contaminant source area and plume 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 Contamination

The Permittee shall conduct a surface water investigation to characterize contamination in surface water bodies resulting from contaminant releases at the facility. The investigation shall include the following:

a. a description of the horizontal and vertical extent of any immiscible or dissolved plumes originating from the facility, and the extent of contamination in the underlying sediments;

b. the horizontal and vertical direction and velocity of contaminant movement;

c. an evaluation of the physical, biological, chemical, and radiochemical factors influencing contaminant movement;

d. an extrapolation of future contaminant movement; and

e. a description of the chemistry and radiochemistry of the contaminated surface waters and sediments. This includes determining the pH, total dissolved solids, specific contaminant concentrations, etc.

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

4. Air Contamination

The Permittee shall conduct an investigation to characterize the particulate and gaseous contaminants released into the atmosphere.

This investigation shall 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, radiochemical, and physical composition of the contaminants released, including horizontal and vertical concentration profiles.

5. Subsurface Gas

The Permittee shall provide information characterizing the nature, rate, and extent of releases of reactive gases from the units. Such information shall include, but not be limited to: provisions for monitoring subsurface gases released from the unit; and an assessment of the potential for these releases to have a threat to human health and the environment.

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

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 and radiochemical analysis of biological samples may be needed. Data on observable effects in ecosystems may also be obtained.

TASK IV: INVESTIGATIVE ANALYSIS

The Permittee shall prepare an analysis and summary of all facility investigations and their results. 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 the environment, and to support the CMS, if one is required.

The Permittee shall analyze all facility investigation data outlined in Task III and prepare a report on the type and extent of contamination at the facility including sources and migration pathways. The report shall describe the extent of contamination (qualitative/quantitative) in relation to the background levels indicative for the area.

The Permittee shall identify all relevant, applicable, and appropriate standards for the protection of human health and the environment (e.g., National Ambient Air Quality Standards, Federally-approved State water quality standards, ground water protection standards, etc.).

TASK V: REPORTS

A. Preliminary and Work Plan

The Permittee shall submit to the Director or designee the DOCC (Task I) and the RFI Work Plan (Task II) as described in the Permit.

B. Progress

The Permittee shall at a minimum provide the Director or designee with signed, semi-annual progress reports containing:

1. A description and estimate of the percentage of the RFI completed;
2. Summaries of all findings to date;
3. Summaries of all changes made in the RFI during the reporting period;
4. Summaries of all contacts relevant to corrective action with representatives of the local community, public interest groups or State government during the reporting period;
5. Summaries of all problems or potential problems relevant to corrective action encountered during the reporting period;
6. Actions being taken to rectify problems;
7. Changes in key project personnel during the reporting period; and
8. Projected work for the next reporting period.

C. RFI Report

The Permittee shall submit one (1) hardcopy and one (1) electronic copy of the RFI Report for the Director or designee's review. The Director or designee will either approve or disapprove the RFI Report in writing. In the event of disapproval (in whole or in part) of the plan, the Director or designee will specify any deficiencies in writing. The Permittee shall incorporate the comments in a revised RFI Report within thirty (30) calendar days of receipt of the disapproval by the Director or designee. Should the Permittee take exception to all or part of the disapproval, the Permittee may invoke dispute resolution as outlined by Permit Module XII(b), Condition B.5., Standard Conditions, above. If necessary to accomplish matters of noted deficiencies of dispute resolution, the Director or designee will make further modifications as required. If the Director or designee modifies the RFI Report, this modified report becomes the approved RFI Report subject to the Permittee's rights to dispute resolution outlined by Permit Module XII(b), Condition B.5., Standard Conditions.

R. SCOPE OF WORK FOR A CORRECTIVE MEASURE STUDY (CMS) PURPOSE

PURPOSE

The purpose of this CMS is to develop and evaluate the corrective action alternative or alternatives and to recommend the corrective measure or measures to be taken by the Permittee.

The Permittee shall furnish the personnel, materials, and services necessary to prepare the CMS, except as otherwise specified.

If the Permittee believes that certain requirements of the scope of work are not applicable, the specific requirements shall be identified and a detailed rationale for inapplicability shall be provided.

PLAN

The Permittee shall submit a CMS Plan to accomplish all pertinent work of this Condition, Tasks VI-IX, and as outlined in Permit Module XII(b), Condition K., CMS Plan.

SCOPE

The CMS consists of four tasks:

Task VI: Identification and Development of the Corrective Measure Alternative or Alternatives

- A. Description of Current Situation
- B. Establishment of Corrective Action Objectives
- C. Laboratory, Bench-Scale, and Pilot Study
- D. Screening of Corrective Measures Technologies
- E. Identification of the Corrective Measure-Alternative or Alternatives

Task VII: Evaluation of the Corrective Measure Alternative(s)

- A. Technical/Environmental/Human Health/Institutional
- B. Cost Estimate

Task VIII: Justification and Recommendation of the Corrective Measure(s)

- A. Technical
- B. Human Health
- C. Environmental

Task IX: Reports

- A. Progress
- B. CMS Report

The required information shall include each item specified under Permit Module XII(b), Condition R., Scope of Work for a CMS, Tasks VI-IX. It is mandatory that the work of the

Tasks VI-IX be sufficient to allow for immediate design implementation without requiring further study and for analysis. Since these required items are essential elements of this Permit, failure to submit any of these elements or submission of inadequate or insufficient information may subject the Permittee to enforcement action under the Arkansas Hazardous Waste Management Act which may include fines, suspension, or revocation of the Permit.

TASK VI: IDENTIFICATION AND DEVELOPMENT OF THE CORRECTIVE ACTION ALTERNATIVE OR ALTERNATIVES

Based on the results of the RFI, the Permittee shall identify, screen, and develop the alterative(s) for removal, containment, treatment, and other remediation of the contamination based on the objectives established for the corrective action.

A. Description of Current Situation

The Permittee shall submit 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 RFI report. The Permittee shall provide an update to information presented in Task I of the RFI to the Director or designee regarding previous response activities and any 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.

B. Establishment of Corrective Action Objectives

The Permittee, in conjunction with the Director or designee, shall establish site specific objectives for the corrective action. These objectives shall be based on public health and environmental criteria, information gathered during the RCRA Facility Investigation, EPA guidance and the requirements of any applicable State and Federal statutes. At a minimum, all corrective actions concerning ground water releases from solid waste management units must be consistent with, and as stringent as, those required under APC&EC Regulation No. 23 §264.101.

C. Laboratory, Bench-Scale, and Pilot-Scale Study

When a new technology is being proposed or similar waste streams have not routinely been treated or disposed using the technology the Permittee shall conduct laboratory, bench-scale, and pilot-scale studies to determine the applicability of a corrective measure technology or technologies to the facility conditions. The Permittee shall analyze the technologies, based on literature review, vendor contracts, and past experience to determine the testing requirements.

The Permittee shall develop a testing plan identifying the type(s) and goal(s) of the study(ies), the level of effort needed, and the procedures to be used for data management and interpretation. The plan goals shall be sufficiently broad to allow the Permittee to prepare corrective measures alternative(s) which can be implemented in the CMI Work [Permit Module XII(b), Condition S., Scope of Work for the CMI] without further study in the CMI phase.

Upon completion of testing, the Permittee shall evaluate the testing results to assess the technology or technologies with respect to the site-specific questions identified in the test plan. The Permittee shall prepare a report summarizing the testing program and its results, both positive and negative.

D. Screening of Corrective Measure Technologies

The Permittee shall review the results of the RFI and assess the technologies which are applicable to the facility. The Permittee shall screen the preliminary 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:

1. 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;

2. 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); and

3. Technology Limitations

   The level of technology development, performance record, and inherent construction, operation and maintenance problems shall 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 that have been developed to a point where they can be implemented in the field without extensive technology transfer or development are suitable, but are not suitable if the opposite is true. Technologies which cannot be implemented under the CMI work phase without additional study in the CMI phase must be eliminated.

E. Identification of the Corrective Measure Alternatives

The Permittee shall develop the corrective measure alternatives based on the corrective measure objectives and analysis included herein (Task VI). The Permittee shall rely on engineering practice to determine which of the previously identified technologies appear most suitable for the site.

Technologies can be combined to form the overall corrective action alternatives. The alternatives developed should represent a workable number of options that each appear to adequately address all site problems and corrective action objectives. Each alternative may consist of an individual technology or a combination of technologies. The Permittee shall document the reasons for excluding technologies, identified herein (Task VI), as supplemented in the development of the alternative.

TASK VII: EVALUATION OF THE CORRECTIVE MEASURE ALTERNATIVE OR ALTERNATIVES

The Permittee shall describe each corrective measure alternative that passed the Initial Screening in Task VI and evaluate each corrective measure alternative and its components. The evaluation shall be based on technical, environmental, human health and institutional concerns. The Permittee shall also develop cost estimates for each corrective measure.

A. Technical/Environmental/Human Health/Institutional

The Permittee shall provide a description of each corrective measure alternative which includes but is not limited to the following: preliminary process flow sheets, preliminary sizing and type of construction for buildings and structures, and rough quantities of utilities required. The Permittee shall evaluate each alternative in the four following areas:

1. Technical

The Permittee shall evaluate each corrective measure alternative based on performance, reliability, implementability, and safety.

a. The Permittee shall evaluate performance based on the effectiveness and useful life of the corrective measure.

i. Effectiveness shall be evaluated in terms of the ability to perform intended functions such as containment, diversion, removal, destruction, or treatment. The effectiveness of each corrective measure shall be determined either through design specifications or by performance evaluation. Any specific waste or site characteristics which could potentially impede effectiveness shall be considered. The evaluation should also consider the effectiveness of combinations of technologies.

ii Useful life is defined as the length of time the level of effectiveness can be maintained. Most corrective measure technologies, with the exception of destruction, deteriorate with time. Often, deterioration can be slowed through proper system operation and maintenance, but the technology eventually may require replacement. Each corrective measure shall be evaluated in terms of the projected service lives of its component technologies. Resource availability in the future life of the technology, as well as appropriateness of the technologies, must be considered in estimating the useful life of the project.

b. The Permittee shall provide information on the reliability of each corrective measure including their operation and maintenance requirements and their demonstrated reliability:

i. Operation and maintenance requirements include the frequency and complexity of necessary operation and maintenance. Technologies requiring frequent or complex operation and maintenance activities should be regarded as less reliable than

technologies requiring little or straightforward operation and maintenance. The availability of labor and materials to meet these requirements shall also be considered; and

ii. Demonstrated and expected reliability is a way of measuring the risk and effect of failure. The Permittee should evaluate whether the technologies have been used effectively under analogous conditions, whether the combination of technologies have been used together effectively, whether failure of any one technology has an immediate impact on receptors, and whether the corrective measure has the flexibility to deal with uncontrollable changes at the site.

c. The Permittee shall describe the implementability of each corrective measure including the relative ease of installation (constructability) and the total time required to achieve a given level of response:

i. Constructability is determined by conditions both internal and external to the facility conditions and includes such items as location of underground utilities, depth to water table, heterogeneity of subsurface materials, and location of the facility (i.e., remote location vs. a congested urban area). The Permittee shall evaluate what measures can be taken to facilitate construction under these conditions. External factors which affect implementation include the need for special permits or agreements, equipment availability, and the location of suitable off-site treatment or disposal facilities;

ii. Two components of time shall be addressed: the time it takes to implement a corrective measure and the time it takes to actually see beneficial results. Beneficial results are defined as the reduction of contamination to some acceptable, pre-established level.

d. The Permittee shall evaluate each corrective measure alternative with regard to safety. This evaluation shall include threats to the safety of nearby communities and environments as well as those to workers during implementation. Factors to consider include fire, explosion, and exposure to hazardous substances.

2. Environmental

The Permittee shall perform an Environmental Assessment for each alternative. The Environmental Assessment shall focus on facility conditions and pathways of contamination actually addressed by each alternative. The Environmental Assessment for each alternative will include, at a minimum, an evaluation of: the short- and long-term beneficial and adverse effects of the response alternative, any adverse effects on environmentally sensitive areas, and an analysis of measures to mitigate adverse impacts.

3. Human Health

The Permittee shall assess each alternative in terms of the extent which it mitigates short- and long-term potential exposure to any residual contamination and protects human health both during and after implementation of the corrective measure. The assessment shall describe the levels and characterizations of contaminants on-site, potential exposure routes, and potentially affected populations. Each alternative shall be evaluated to determine the level of exposure to contaminants and the reduction over time. For management of mitigation measures, the relative reduction of impact shall be determined by comparing residual levels of each alternative with existing criteria, standards, or regulations acceptable to the Director or designee.

4. Institutional

The Permittee shall assess relevant institutional needs for each alternative. Specifically, the effects of Federal, State, and local environmental and public health standards, regulations, guidance, advisories, ordinances, or community relations on the design, operation, and timing of each alternative.

B. Cost Estimate

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 capital and operation and maintenance costs.

1. Capital costs consist of direct (construction) and indirect (non-construction and overhead) costs.

a. Direct capital costs include:

i. Construction costs: Cost of materials, labor (including fringe benefits and worker's compensation), and equipment required to install the corrective measure alternative.

ii. Equipment costs: Costs of treatment, containment, disposal, and service equipment necessary to implement the action; these materials remain until the corrective action is completed;

iii. Land and site development costs: Expenses associated with purchase of land and development of existing property; and

iv. Building and services costs: Costs of process and nonprocess buildings, utility connections, purchased services, and disposal costs.

b. Indirect capital costs include:

i. Engineering expenses: Costs of administration, design, construction supervision, drafting, and testing of corrective measure alternatives;

ii. Legal fees and license or permit costs: Administrative and technical costs necessary to obtain licenses and permits for installation and operation;

iii. Start-up and shakedown costs: Costs incurred during corrective measure start-up; and

iv. Contingency allowances: Funds to cover costs resulting from unforeseen circumstances, such as adverse weather conditions, strikes, and inadequate facility characterization.

2. Operation and maintenance costs are post-construction costs necessary to ensure continued effectiveness of a corrective measure. The Permittee shall consider the following operation and maintenance cost components:

a. Operating labor costs: Wages, salaries, training, overhead, and fringe benefits associated with the labor needed for post-construction operation;

b. Maintenance materials and labor costs: Costs for labor, parts, and other resources required for routine maintenance of facilities and equipment;

c. Auxiliary materials and energy: Costs of such items as chemicals and electricity for treatment plant operations, water and sewer service, and fuel;

d. Purchased services: Sampling costs, laboratory fees, and professional fees for which the need can be predicted;

e. Disposal and treatment: Costs of transporting, treating, and disposing of waste materials, such as treatment plant residues generated during operation;

f. Administrative costs: Costs associated with administration of corrective measure operation and maintenance not included under other categories;

g. Insurance, taxes, and licensing costs: Costs of such items as liability and sudden accidental occurrence insurance; real estate taxes on purchased land or rights-of-way; licensing fees for certain technologies; and permit renewal and reporting costs;

h. Maintenance reserve and contingency funds: Annual payments into escrow funds to cover (1) costs of anticipated replacement or rebuilding of equipment and (2) any large unanticipated operation and maintenance costs; and

i. Other costs: Items that do not fit any of the above categories.

TASK VIII: JUSTIFICATION AND RECOMMENDATION OF THE CORRECTIVE MEASURE OR MEASURES

The Permittee shall justify and recommend a corrective measure alternative using technical, human health, and environmental criteria. This recommendation shall include summary tables which allow the alternative or alternatives to be understood easily. Tradeoffs among health risks, environmental effects, and other pertinent factors shall be highlighted, and the corrective measure alternative or alternatives to be implemented based on the results of Tasks VI and VII must be approved by the Director or designee before implementation. The Director or designee may also choose a different remedy or modify the recommended remedy in responding to and approving the Corrective Measures Report, Task IX, or in response to public comments on the Draft RADD [Permit Module XII(b), Condition R., Scope of Work for a CMS, Task IX.C]. At a minimum, the following criteria will be used to justify the final corrective measure or measures:

A. Technical

1. Performance - corrective measure or measures which are most effective at performing their intended functions and maintaining the performance over extended periods of time will be given preference;

2. Reliability - corrective measure or measures which do not require frequent or complex operation and maintenance activities and have proven effective under waste and facility conditions similar to those anticipated will be given preference;

3. Implementability - corrective measure or measures which can be designed immediately upon approval and can be constructed and operated to reduce levels of contamination to attain or exceed applicable standards in the shortest period of time will be preferred; and

4. Safety - corrective measure or measures which pose the least threat to the safety of nearby residents and environments as well as workers during implementation will be preferred.

B. Human Health

The corrective measure or measures must comply with existing U.S. EPA criteria, standards, or regulations for the protection of human health. Corrective measures which provide the minimum level of exposure to contaminants and the maximum reduction in exposure with time are preferred.

C. Environmental

The corrective measure(s) posing the least adverse impact (or greatest improvement) on the environment over the shortest period of time will be favored.

TASK IX: REPORTS

The Permittee shall prepare a CMS Report presenting the results of Tasks VII and VIII recommending a corrective measure alternative. One (1) hardcopy and one (1) electronic copy of the CMS Report shall be provided to the Director or designee by the Permittee.

A. Progress

The Permittee shall at a minimum provide the Director or designee with signed semiannual progress reports containing:

1. A description and estimate of the percentage of the CMS completed;
2. Summaries of all findings;
3. Summaries of all changes made in the CMS during the reporting period;
4 Summaries of all contacts related to corrective action with representatives of the local community, public interest groups, or State government during the reporting period;
5. Summaries of all problems or potential problems encountered during the reporting period;
6. Actions being taken to rectify problems;
7. Changes in personnel during the reporting period;
8. Projected work for the next reporting period; and
9. Copies of daily reports, inspection reports, laboratory/monitoring data, etc.

B. Content of CMS Report

The Report shall at a minimum include:

1. A Summary of the Corrective Measure or Measures and Rationale:
    a. Description of the corrective measure or measures and rationale for selection;
    b. Performance expectations;
    c. Preliminary design criteria and rationale;
    d. General operation and maintenance requirements;
    e. Long-term monitoring requirements
2. Design and Implementation Precautions:
    a. Special technical problems;
    b. Additional engineering data required;
    c. Permits and regulatory requirements;
    d. Access, easements, right-of-way;
    e. Health and safety requirements; and
    f. Community relations activities.

3. Cost Estimates and Schedules:

   a. Capital cost estimate;

   b. Operation and maintenance cost estimate; and

   c. Project schedule (design, construction, operation).

C. CMS Report and RADD

The Director or designee will either tentatively approve or disapprove the CMS Report in writing along with his development of a Draft RADD conforming to the process of the ADEQ Guidance Document titled Checklist- Remedial Action Decision Document, Outline for a Proposed Plan of Action. The purpose of the Draft RADD is to choose the corrective action remedy for each unit or group of units. In the event of disapproval (in whole or in part) of the Report prior to public notice of the Draft RADD, the Director or designee will specify any deficiencies in writing. The Permittee shall incorporate the comments in a revised CMS Report within thirty (30) calendar days of receipt of the disapproval by the Director or designee. However, in most cases it will be appropriate for the Director or designee to develop a Draft RADD, public notice the Draft RADD, and require modifications to the CMS Report to conform to the Draft RADD and to address public comments to the Draft RADD.

The Director or designee shall prepare a Public Notice for the CMS Report and Draft RADD. The Permittee shall bear the cost of the Public Notice. The Director or designee will consider comments from the public prior to the approval of the CMS Report and in preparation of the Final RADD. Should the Permittee take exception to all or part of the disapproval or modified approval through the RADD of the CMS Report, the Permittee may invoke dispute resolution as outlined by Permit Module XII(b), Condition B.5., Standard Conditions, above after the public comment period. If necessary to accomplish matters of noted deficiencies or of dispute resolution, the Director or designee will make further modifications as required. If the Director or designee modifies the CMS Report, this modified report becomes the approved CMS Report. It may be necessary for the Director or designee to develop a modified Draft RADD and submit it a second time for public review and comment followed by the CMS Report approval as outlined above. The CMS Report must include a schedule for implementing all corrective measure designs and construction as applicable. This schedule is subject to approval and modification through the RADD.

S. SCOPE OF WORK FOR THE CORRECTIVE MEASURE IMPLEMENTATION (CMI)

PURPOSE

The purpose of this CMI program is to design, construct, operate, maintain, and monitor the performance of the corrective measures selected through the Final RADD to protect human health and the environment. The Permittee shall furnish all personnel, materials, and services necessary for the implementation of the corrective measure or measures.

SCOPE

The CMI program consists of four tasks:

Task X: CMI Program Plan

A. Program Management Plan

B. Community Relations Plan

Task XI: Corrective Measure Design

A. Construction Drawings and Specifications

B. Operation and Maintenance Plan

C. Monitoring and Effectiveness Evaluation

D. Cost Estimate

E. Project Schedule

F. Construction Quality Assurance Objectives

G. Health and Safety Plan

H. Design Phases

Task XII: Corrective Measure Construction

A. Responsibility and Authority

B. Construction Quality Assurance Personnel Qualifications

C. Inspection Activities

D. Sampling Requirements

E. Documentation

Task XIII: Reports

A. Progress

B. CMI Program Plan

TASK X: CMI PROGRAM PLAN

The Permittee shall prepare a CMI Program Plan. This program shall include the development and implementation of several documents, which require concurrent preparation. The Permittee shall implement this Task X as well as Task XI work concurrently. It may be necessary to revise plans as the work is performed to focus efforts on a particular problem. The Program Plan shall include the following:

A. Program Management Plan

The Permittee shall prepare a Program Management Plan which will document the overall management strategy for performing the design, construction, operation, maintenance and monitoring of corrective measures(s). All corrective measure designs shall be scheduled and implemented simultaneously, unless otherwise approved in the Final RADD, and the plan shall reflect this provision. The plan shall document the responsibility and authority of all organizations and key personnel involved with the implementation. The Program Management Plan shall also include a description of qualifications of key personnel directing the CMI Program, including contractor personnel. The plan shall include but not be limited to the following:

1. Discussion of the design strategy and the design basis, including:
    a. Compliance with all applicable or relevant environmental and public health standards; and
    b. Minimization of environmental and public interests.
2. Discussion of the technical factors of importance including:
    a. Use of currently accepted environmental control measures and technology;
    b. The constructability of the design;
    c. Use of currently acceptable construction practices and techniques;
    d. Use of facilities and designs which will provide highly reliable, easily maintained, and where possible, visual inspection of critical, but hard to access, facilities such as leak collection pipes; and
    e. Overview description of how the design operates (as applicable) and includes this on construction drawings.
3. Description of assumptions made and detailed justification of these assumptions.
4. Discussion of the possible sources of error and references to possible operation and maintenance problems.
5. Appendices including:
    a. Sample calculations (one example presented and explained clearly for significant or unique design calculations);
    b. Derivation of equations essential to understanding the report; and
    c. Results of laboratory and field tests.

B. Community Relations Plan

The plan shall include but not be limited to the following:

1. Specific activities which shall be conducted during the design stage are as follows:

   a. Revise the facility Community Relations Plan to reflect knowledge of citizen concerns and involvement at this stage of the process; and

   b. Prepare and distribute a public notice and an updated fact sheet at the completion of engineering design.

2. Specific activities to be conducted during the construction stage could be the following: Depending on citizen interest at a facility at this point in the corrective action process, community relations activities could range from group meetings to fact sheets on the technical status.

The Permittee shall revise the Community Relations Plan to include any changes in the level of concern of information needs to the community during design and construction activities.

TASK XI: CORRECTIVE MEASURE DESIGN

The Permittee shall prepare design documents (Design Document submission) to implement the corrective measures(s) at any site that requires corrective measures. All individual designs shall be implemented simultaneously immediately upon final approval of the selected corrective measure in the Final RADD and shall include the following:

A. Construction Drawings and Specifications

The Permittee shall develop clear and comprehensive construction drawings and specifications. The specifications shall follow the principles established in the Manual of Practice published by the Construction Specifications Institute (CSI) and shall be organized in the CSI 16-division, three-part section format with five digit section numbers. These design documents shall include but not be limited to the following:

1. Detailed drawings of the proposed design including:
    a. Plans, profiles, cross sections, details, etc.;
    b. Quantitative flow sheets;
    c. Piping and instrument diagrams;
    d. Plans for borrow areas (as applicable);
2. Detailed specifications including:
    a. All items of design including quality of materials and workmanship;
    b. Schedule of quality control certification and testing for all items of construction;
    c. Investigative results for borrow areas (as applicable);

These construction drawings and specifications shall be submitted simultaneously with the Design Document submission.

B. Operation and Maintenance (O & M) Plan

The Permittee shall prepare an O & M Plan to cover both implementation and long term maintenance of the corrective measure. The plan shall be composed of the following elements:

1. Description of normal O&M:
    a. Description of tasks for operation;
    b. Description of tasks for maintenance;
    c. Description of prescribed treatment or operation conditions; and
    d. Schedule showing frequency of each O&M task.
2. Description of potential operating problems:
    a. Description and analysis of potential operation problems;
    b. Description of quantitative measurements of downtime or non-operational time for each facility and unit thereof;

c. Sources of information regarding problems; and

d. Common and anticipated remedies.

3. Description of routine monitoring and laboratory testing:

a. Description of monitoring tasks;

b. Description of method to measure leachate collection and visually inspect (TV camera or otherwise) leak detection pipes if a leak develops;

c. Description of required laboratory tests and their interpretation;

d. Required QA/QC; and

e. Schedule of monitoring frequency and date, if appropriate, when monitoring may cease.

4. Description of alternate O&M:

a. Should system fail, alternate procedures to prevent undue hazard; and

b. Analysis of vulnerability, additional resource requirements, and additional corrective action facilities needed should a failure occur.

5. Safety plan:

a. Description of precautions, of necessary equipment, etc., for site personnel; and

b. Safety tasks required in event of system failure.

6. Description of equipment and:

a. Equipment identification;

b. Installation of monitoring components;

c. Maintenance of site equipment;

d. Replacement schedule for equipment and installed components; and

e. List of spare parts maintained on site with an inventory checklist updated monthly for the spare parts.

7. Records and reporting mechanisms required:

a. Daily operating logs;

b. Laboratory records;

c. Records for operating costs;

d. Mechanism for reporting emergencies;

e. Personnel and maintenance records;

f. Downtime for each applicable facility or unit; and

g. Monthly reports to the Director or designee which shall especially identify problems, failures, and corrective actions taken for such failures.

An O&M Plan shall be submitted simultaneously with the Design Document submission.

C. Monitoring and Effectiveness Evaluation

The Permittee shall develop a system for monitoring and evaluating each corrective measure for each unit or units as necessary to show that the intended remedy and its environmental protection have been and continue to be met. This proposal by the Permittee shall include a sampling and analysis and quality assurance plan (compliant with RFI standards), monitoring and reporting requirements, and the basis for determining the success or failure of the remedy for the particular systems as well as a proposal for initiating additional corrective measures compliant with the CMI Standards of this permit. This document shall be submitted simultaneously with the Design Document submission.

D. Cost Estimate

The Permittee shall develop cost estimates for the purpose of assuring that the facility has the financial resources necessary to construct and implement the corrective measure. The cost estimate developed in the Corrective Measure Study shall be refined to reflect the more detailed/accurate construction drawings and specifications being developed. The cost estimate shall include both capital and operation and maintenance costs and must contain contingency costs. The Cost Estimate shall be submitted simultaneously with the Design Document submission. The Cost Estimate must be updated for contract award costs provided to the Director or designee and, once approved by the Director or designee, shall be the basis for updating the Corrective Action Financial Assurance required under this permit.

E. Project Schedule

The Permittee shall develop a detailed Project Schedule for construction and implementation of the corrective measure(s) which identifies timing for initiation and completion of all critical path tasks. This shall reflect simultaneous and coordinated implementation of individual designs. The Permittee shall specifically identify dates for completion of the project(s) and major interim milestones which shall be enforceable terms of this permit. A Project Schedule shall be submitted simultaneously with the Design Document submission.

F. Construction Quality Assurance Objectives

The Permittee shall identify and document the objective and framework for the development of a construction quality assurance program including, but not limited to the following: responsibility and authority, personnel qualifications, inspection activities, sampling requirements, and documentation. A detailed Construction Quality Assurance Plan (CQAP) shall be developed for each corrective measure design. The CQAP shall include a detailed list and frequency of quality control tests to be performed for all items of construction and shall include sampling and analysis procedures for this work. Remediation contractor quality control and quality assurance are not acceptable for certification of this work to the Director or designee. This work must be accomplished by a party independent of the remediation contractor and by a third party directly

responsible to the Permittee. Task XII gives further details for the provisions of the CQAP which shall be submitted simultaneously with the Design Document submission.

G. Health and Safety Plan

The Permittee shall modify the Health and Safety Plan developed for the RFI to address the activities to be performed at the facility to implement the corrective measure(s). This document shall be submitted simultaneously with the Design Document submission.

H. Design Phases

The design (Design Document submission) of major and complicated corrective measure(s) should include the applicable phases outlined below. The preliminary and intermediate designs will not be required by the Director or designee for noncomplex projects, and the Permittee must request approval from the Director or designee for any projects for which these design phases will be used.

1. Preliminary Design

The Permittee shall submit the Preliminary design when the design effort is approximately 30 percent complete. At this stage the Permittee shall have field verified the existing conditions of the facility. The preliminary design shall reflect a level of effort such that the technical requirements of the project have been addressed and outlined so that they may be reviewed to determine if the final design will provide an operable and usable corrective measure. Supporting data and documentation defining the functional aspects of the program shall be provided with the design documents. The preliminary construction drawings by the Permittee shall reflect organization and clarity. The scope of the specifications shall be outlined in a manner reflecting the final specifications. The Permittee shall include with the preliminary submission design calculations reflecting the same percentage of completion as the designs they support.

2. Intermediate Design

Complex project design may necessitate review of the design documents between the preliminary and the prefinal/final design. At the discretion of the ADEQ, a design review may be required at 60 percent completion of the project. The intermediate design submittal should include the same elements as the prefinal design, but developed to further detail.

3. Prefinal and Final Design

The Permittee shall submit the prefinal/final design documents in two parts. The first submission shall be at 95 percent completion of design (i.e., prefinal). After approval of the prefinal submission, the Permittee shall execute the required revisions and submit the final documents 100 percent complete with reproducible drawings and specifications.

The prefinal design submittal shall consist of the Design Drawings and Specifications, CQAP, O & M Plan, Monitoring and Effectiveness Plan, Capital Costs for Final Design and for O & M Plan, Final Quality Assurance Plan, and

Health and Safety Plan. The quality of the design documents should be such that the Permittee would be able to include them in a bid package and invite contractors to submit bids for the construction project.

4. Correlating Drawings and Specifications

General correlation between construction drawings and specifications is a basic requirement of any set of working construction drawings and specifications. Before submitting the project specifications, the Permittee shall:

a. Coordinate and cross-check the specifications, drawings, and CQAP; and

b. Complete the proofing of the edited specifications and required cross-checking of all drawings and specifications and CQAP.

These activities shall be completed prior to the 95 percent prefinal submittal to the Director or designee.

5. Equipment Start-up and Operator Training

The Permittee shall prepare, and include in the specifications governing treatment systems, contractor requirements for providing: appropriate service visits by experienced personnel to supervise the installation, adjustment, start-up, and operation of the treatment systems; and training covering appropriate operational procedures once the start-up has been successfully accomplished.

6. Additional Studies

CMI may require additional studies to address unknown or unforeseen problems which were not addressed in the CMS work phase, but this condition is not intended to allow inadequate CMS work requiring later supplementation (the CMS work must be sufficiently complete to allow CMI designs). At the direction of the Director or designee for any such studies required, the Permittee shall furnish all services, including field work as required, materials, supplies, plant, labor, equipment, investigations, studies, and superintendence. Sufficient sampling, testing and analysis shall be performed to optimize the required treatment and disposal operations and systems. There shall be an initial meeting of all principal personnel involved in the development of the program. The purpose will be to discuss objectives, resources, communication channels, roles of personnel involved, and orientation of the site, etc. The interim report shall present the results of the testing with the recommended treatment or disposal system (including options). A review conference shall be scheduled after the interim report has been reviewed by all interested parties. The final report of the testing shall include all data taken during the testing and a summary of the results of the studies.

TASK XII: CORRECTIVE MEASURE CONSTRUCTION

Following Director or designee approval of the final design, the Permittee shall immediately implement construction of the corrective measure and the CQAP to ensure, with a reasonable degree of certainty, that a completed corrective measure(s) meets or exceeds all design criteria, drawings, and specifications. The CQAP is a facility specific document which must be submitted to the Director or designee with design submittals.

At a minimum, the CQAP should include the elements which are summarized below and as necessary to fulfill the requirements of Permit Module XII(b), Condition S., Scope of Work for the CMI, Task XI.F. Upon Director or designee approval, the Permittee shall construct and implement the corrective measures in accordance with the approved design, schedule in the Design Document submission or in accordance with Permit Module XII(b), Condition T., Facility Submission, and the CQAP. The Permittee shall also carry out all elements of the approved Operation and Maintenance Plan as and when applicable to construction facilities.

A. Responsibility and Authority

The responsibility and authority of all organizations (i.e., technical consultants, construction firms, etc.) and key personnel involved in the construction of the corrective measure shall be described fully in the CQAP. The Permittee shall identify a CQA officer and the necessary supporting inspection staff.

B. Construction Quality Assurance Personnel Qualifications

The qualifications of the CQA officer and supporting inspection personnel shall be presented in the CQAP to demonstrate that they possess the training and experience necessary to fulfill their identified responsibilities.

C. Inspection Activities

The observations and tests that will be used to monitor the construction and installation of the components of the corrective measure(s) shall be summarized in the CQAP. The plan shall include the scope and frequency of each type of inspection. Inspections shall verify compliance with all environmental and engineering requirements and include, but not be limited to air quality and emissions monitoring records, waste disposal records (e.g., RCRA transportation manifests), specifications, designs, etc. The inspection should also ensure compliance with all health and safety procedures. In addition to oversight inspections, the Permittee shall conduct the following activities:

1. Preconstruction Inspection and Meeting

The Permittee shall conduct a preconstruction inspection and meeting with ADEQ to:

a. Review methods for documenting and reporting inspection data;

b. Review methods for distributing and storing documents and reports;

c. Review work area security and safety protocol;

d. Discuss any appropriate modifications of the CQAP to ensure that site-specific considerations are addressed; and

e. Conduct a site walk-around to verify that the design criteria, drawings, and specifications are understood and to review material and equipment storage locations.

f. To bring attention to all problems, discrepancies, etc., which are known to date to allow their resolution prior to begin of construction.`

The preconstruction inspection and meeting shall be documented by a designated person, and minutes should be transmitted to all parties.

2. Pre-final Inspection

Upon preliminary project completion the Permittee shall notify the Director or designee for the purposes of conducting a prefinal inspection. The prefinal inspection will consist of a walk-through inspection of the entire project site. The inspection is to determine whether the project is complete and consistent with the contract documents and the Director or designee approved corrective measure. Any outstanding construction items discovered during the inspection will be identified and noted. Additionally, treatment equipment shall be operationally tested by the Permittee. The Permittee shall certify that the equipment has performed to meet the purpose and intent of the specifications. Retesting shall be completed where deficiencies are revealed. The prefinal inspection report should outline the outstanding construction items, actions required to resolve items, completion date for these items, and date for final inspection.

3. Final Inspection

Upon completion of any outstanding construction items, the Permittee shall notify the Director or designee for the purposes of conducting a final inspection. The final inspection will consist of a walk-through inspection of the project site. The prefinal inspection report will be used as a checklist with the final inspection focusing on the outstanding construction items identified in the prefinal inspection. Confirmation shall be made that outstanding items have been resolved.

D. Sampling Requirements

The sampling activities, sample size, sample locations, frequency of testing, acceptance and rejection criteria, and plans for correcting problems as addressed in the project specifications should be presented in the CQAP.

E. Documentation

Reporting requirements for CQA activities shall be described in detail in the CQAP. This should include such items as daily summary reports, inspections data sheet, problem identification and corrective measures reports, design acceptance reports, and final documentation. Provisions for the final storage of all records should be presented in the CQAP. The documentation must be adequate to show that all verification tests of the CQAP and as necessary to verify the certification of corrective measure(s) called for by the CQAP.

TASK XIII: REPORTS

The Permittee shall prepare reports for the progress of development of the drawings, specifications, CQAP, etc., as set forth in Task XI and Task XII and to document the design, construction, operation, maintenance, and monitoring of the corrective measure(s). The documentation shall include but not be limited to the following:

A. Progress

The Permittee shall at a minimum provide the Director or designee with signed, monthly progress reports containing:

1. A description and estimate of the percentage of the CMI completed (designs and construction);
2. Summaries of all findings, CQAP test results, and data;
3. Summaries of all changes made in the CMI during the reporting period;
4. Summaries of all contacts with representative of the local community, public interest groups or State government during the reporting period;
5. Summaries of all problems or potential problems encountered during the reporting period;
6. Actions being taken to rectify problems;
7. Changes in personnel associated with corrective measures during the reporting period;
8. Projected work for the next reporting period; and
9. Copies of daily reports, inspection reports, laboratory/monitoring data, etc.

B. Corrective Measure Implementation Program Plan

1. The Permittee shall submit a Corrective Measure Implementation Program Plan as outlined in Task X;
2. The Permittee shall submit the Construction Drawings and Specifications, CQAP, Monitoring and Effectiveness Plan, Design Reports, Cost Estimate, Project Schedule, O & M Plan, and Health and Safety Plan as outlined in Task XI;
3. At the "completion" of the construction of the project, the Permittee shall submit a Corrective Measure Implementation Report to the Director or designee. The Report shall document that the project is consistent with the design specifications and the CQAP, and that the corrective measure is performing adequately. The Report shall include, but not be limited to, the following elements:
    a. Synopsis of the corrective measure and certification of the design and construction;
    b. Explanation of any modifications to the drawings and why these were necessary for the project;

c. Listing of the criteria, established before the corrective measure was initiated, for judging the functioning of the corrective measure and also explaining any modification to these criteria;

d. Results of facility monitoring, indicating that the corrective measure will meet or exceed the performance criteria for effectiveness; and

e. Explanation of the operation and maintenance (including monitoring) to be undertaken at the facility.

This report shall include all of the daily inspection summary reports, inspection data sheets, problem identification and corrective measure reports, block evaluation reports, photographic reporting data sheets, design engineers' acceptance reports, all construction quality assurance results, analysis and certifications, deviations from designated material specifications (with justifying documentation), certification of the constructed corrective measure(s), and as- built drawings.

C. CMI Report

The Director or designee will either approve or disapprove the CMI Report in writing. In the event of disapproval (in whole or in part) of the Report, the Director or designee will specify any deficiencies in writing. The Permittee shall incorporate the comments in a revised CMI Report within thirty (30) calendar days of receipt of the disapproval by the Director or designee. Should the Permittee take exception to all or part of the disapproval, the Permittee may invoke dispute resolution as outlined by Permit Module XII(b), Condition B.5., Standard Conditions, above. If necessary to accomplish matters of additional corrective action or of dispute resolution, the Director or designee will make further modifications as required and may require further corrective measures implementation. If the Director or designee modifies the CMI Report, this modified report becomes the approved CMI Report.

If the CMI Report (or the modified report) show that the intended remedy, and desired results, were not attained, the Director or designee can require additional corrective measures implementation to be developed and pursued under the appropriation conditions and tasks of this permit. In addition, if the monitoring and effectiveness system at any time show that the intended remedy has not been accomplished, the Director or designee can require additional corrective measures.

T. FACILITY SUBMISSION

Corrective Measure Implementation for CMI:

SUBMISSION FOR CMI**	**DUE DATE (All days are calendar days)**
Program Management Plan (Task X)	Concurrent with CMI Designs
Design Documents:	
CQAP	With prefinal Design

SUBMISSION FOR CMI**	DUE DATE (All days are calendar days)
Design Phases (Task XI)*	
- Prefinal Design (95%)	120 calendar days after approval of Corrective Measure Study and Final RADD
-Final Design (100%)	30 calendar Days After Approval of Prefinal Design
Construction of Corrective	As approved in submittals Measures and in the CMS Report and Final RADD or as approved in schedules in CMI Designs
CMI Report (Task XIII)	Upon completion of construction phase

* For noncomplex projects, 95 percent complete submittals shall be made by the Permittee without going through the 30 percent and 60 percent submittal process. Design submittal time frames may be varied slightly to allow for submittal of 30 percent and 60 percent designs but only for complex projects, and such a provision must be approved by the Director or designee before developing such submittals.

** Unless otherwise stipulated and approved in the CMS Report and Final RADD.

END OF MODULE XII(b)

MODULE XII(b) APPENDIX INDEX

APPENDIX A

INTERIM MEASURES WORK PLAN

The Permittee shall submit to the Director or designee for review and approval an Interim Measures Work Plan. The Work Plan shall include the development of several plans which shall be prepared concurrently.

A. INTERIM MEASURES OBJECTIVES

The Work Plan shall specify the objectives or the interim measures, demonstrate how the interim measures will abate releases, and, to the extent possible, be consistent and integrated with any long term solution at the facility. The Interim Measures Work Plan shall include a discussion of the technical approach, engineering design, engineering plans, schedules, budget, and personnel. The Work Plan shall also include a description of qualifications of personnel performing or directing the interim measures, including contractor personnel. This plan shall also document the overall management approach to the interim measures.

B. HEALTH AND SAFETY PLAN

The Permittee shall submit to the Director or designee for review and approval a facility Health and Safety plan.

1. Major elements of the Health and Safety Plan shall include:

   a. Facility description including availability of resources such as roads, water supply, electricity and telephone service;

   b. Description of the known hazards and evaluate the risks associated with the incident and with each activity conducted, including, but not limited to on and off-site exposure to contaminants during the implementation of interim measures at the facility.

   c. List of key personnel and alternates responsible for site safety, responses operations, and for protection of public health;

   d. Delineation of the work area;

   e. Description of the levels of protection to be worn by personnel in work area;

   f. Establishment of procedures to control site access;

   g. Description of decontamination procedures for personnel and equipment;

   h. Establishment of site emergency procedures;

   i. Plan for addressing emergency medical care for injuries and toxicological problems;

   j. Description of requirements for an environmental surveillance program;

   k. Specification for routine and special training required for responders;

l. Establishment of procedures for protecting workers from weather-related problems;

m. Description of emission control equipment; and

n. Description of air monitoring during activities which may expose workers to air contaminants.

2. The Facility Health and Safety Plan shall be consistent with:

a. NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985)

b. EPA Order 1440.1 -Respiratory Protection;

c. EPA Order 1440.3- Health and Safety Requirements for Employees engaged in Field Activities;

d. Facility Contingency Plan;

e. EPA Standard Operating Safety Guide (1984)

f. OSHA regulations particularly in 29 CFR 1910 and 1926;

g. State and local regulations; and

h. Other EPA guidance as provided.

3. The Health and Safety Plan shall be revised to address the activities to be performed at the facility to implement the interim measures.

C. COMMUNITY RELATIONS PLAN

The Permittee shall submit to the Director or designee for review and approval a plan for the dissemination of information to the public regarding interim measure activities and results. These activities shall include the preparation and distribution of fact sheets and participation in public meetings.

END OF APPENDIX A

APPENDIX B

INTERIM MEASURES INVESTIGATION PROGRAM

A. DATA COLLECTION QUALITY ASSURANCE PLAN

The Permittee shall submit to the Director or designee for review and approval a plan to document all monitoring procedures: sampling, field measurements and sample analysis performed during the investigations to characterize the source and contamination, so as to ensure that all information, data, and resulting decisions are technically sound and properly documented.

1. Data Collection Strategy

The strategy section of the Data Collection Quality Assurance Plan shall include but not be limited to the following:

a. Description of the intended uses for the data, and the necessary level of precision and accuracy for these intended uses;

b. Description of methods and procedures to be used to assess the precision, accuracy, and completeness of the measurement data;

c. Description of the rationale used to assure that the data accurately and precisely represent parameter variations at a sampling point, a process condition, or an environmental condition. Examples of factors which shall be considered and discussed include:

i. Environmental conditions at the time of sampling;

ii. Number of sampling points;

iii. Representativeness of selected analytical parameters.

2. Sampling and Field Measurements

The Sampling and Field Measurements section of the Data Collection Quality Assurance Plan shall discuss:

a. Selecting appropriate sampling and field measurement locations, depths, etc.;

b. Providing a sufficient number of sampling and field measurement sites;

c. Measuring all necessary ancillary data;

d. Determining which media are to be sampled (e.g., ground water, air, soil, sediment, etc.);

e. Determining which parameters are to be measured and where;

f. Selecting the frequency of sampling and field measurement and length of sampling period;

g. Selecting the types of sample (e.g., composites vs. grabs) and number of samples to be collected;

h. Documenting field sampling and field measurement operations and procedures, including:

i. Documentation of procedures for preparation of reagents or supplies which become an integral part of the sample (e.g., filters, and absorbing reagents);

ii. Procedures and forms for recording the exact location and specific considerations associated with sample and field measurement data acquisitions;

iii. Documentation of specific sample preservation method;

iv. Calibration of field devices;

v. Collection of replicate samples;

vi. Submission of field-biased blanks where appropriate;

vii. Potential interferences present at the facility;

viii. Construction materials and techniques associated with monitoring wells and piezometers;

ix. Field equipment listing and sample containers;

x. Sampling and field measurement order; and

xi. Decontamination procedures.

i. Selecting appropriate sample containers;

j. Sample preservation; and

k. Chain-of-custody, including:

i. Standardized field tracking reporting forms to establish sample custody in the field prior to shipment; and

ii. Pre-prepared sample labels containing all information necessary for effective sample tracking.

3. Sample Analysis

The Sample Analysis section of the Data collection Quality Assurance Plan shall specify the following:

a. Chain-of-custody procedures, including:

i. Identification of a responsible party to act as sample 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;

ii. Specification of laboratory sample custody log consisting of serially numbered standard lab-tracking report sheets; and

iii. Specification of laboratory sample custody procedures for sample handling, storage, and dispersion for analysis.

b. Sample storage and holding times;

c. Sample preparation methods;

d. Analytical procedures, including:

i. Scope and application of the procedure;

ii. Sample matrix;

iii. Potential interferences;

iv. Precision and accuracy of the methodology; and v) 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:

i. Method blank(s);

ii. Laboratory control sample(s);

iii. Calibration check samples;

iv. Replicate sample(s);

v. Matrix-spiked sample(s);

vi. "Blind" quality control sample(s);

vii. Control charts;

viii. Surrogate sample(s);

xi. Zero and span gases; and

x. Reagent quality control checks.

h. Preventative maintenance procedures and schedules;

i. Corrective action (for laboratory problems); and

j. Turnaround time.

B. DATA MANAGEMENT PLAN

The Permittee shall submit to the Director or designee for review and approval 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 measured; and

f. Result of analysis (*e.g.*, concentration).

2. Tabular Displays

The tabular displays shall include the following:

a. Unsorted (raw) data;

b. Results for each medium or for each constituent monitored;

c. Data reduction for numerical analysis;

d. Summary data.

3. Graphical Displays

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

a. Sampling location and sampling grid;

b. Boundaries of sampling area and areas where more data are required;

c. Levels of contamination at each sampling location;

d. Geographical extent of contamination;

e. Contamination levels, averages, and maxima;

f. Changes in concentration in relation to distance from the source, time, depth or other parameter; and

g. Features affecting intramedia transport; and

h. Potential receptors.

END OF APPENDIX B

APPENDIX C

INTERIM MEASURES DESIGN PROGRAM

A. DESIGN DRAWINGS AND SPECIFICATIONS

The Permittee shall submit to the Director or designee for review and approval clear and comprehensive design construction drawings and specifications which include but are not limited to the following:

1. Discussion of the design strategy and the design basis, including:
    a. Compliance with all applicable or relevant environmental and public health standards; and
    b. Minimization of environmental and public impacts.
2. Discussion of the technical factors of importance including:
    a. Use of currently accepted environmental control measures and technology;
    b. The constructability of the design; and
    c. Use of currently acceptable construction practices and techniques.
3. Description of assumptions made and detailed justification of these assumptions;
4. Discussion of the possible sources of error and references to possible operation and maintenance problems;
5. Detailed drawing of the proposed design including:
    a. Qualitative flow sheets;
    b. Quantitative flow sheets;
    c. Facility layout;
    d. Utility locations; and
    e. Piping and instrument diagrams.
6. Tables listing materials, equipment and specifications;
7. Tables giving material balances;
8. Appendices including:
    a. Sample calculations (one example presented and explained clearly for significant or unique design calculations);
    b. Derivation of equations essential to understanding the report; and
    c. Results of laboratory or field tests.

General correlation between drawings and technical specifications is a basic requirement of any set of working construction drawings and specifications. Before submitting the project specifications, the Permittee shall coordinate and cross-check the specifications and drawings and complete the proofing of the edited specifications and required cross-

checking of all drawings and specifications.

B. O&M PLAN

1. Equipment start-up and operator training

   The Permittee shall prepare, and include in the technical specifications governing treatment systems, contractor requirements for providing: appropriate service visits by experienced personnel to supervise the installation, adjustment, start up and operation of the treatment systems, and training covering appropriate operational procedures once the start-up has been successfully accomplished.

2. Description of normal O&M:

   a. Description of tasks for operation;

   b. Description of tasks for maintenance;

   c. Description of prescribed treatment or operation conditions;

   d. Schedule showing frequency of each O&M task; and

   e. Common and anticipated remedies.

3. Description of monitoring tasks:

   a. Description of monitoring tasks;

   b. Description of required laboratory tests and their interpretation;

   c. Required QA/QC; and

   d. Schedule of monitoring frequency and date, if appropriate, when monitoring may cease.

4. Description of equipment:

   a. Equipment identification;

   b. Installation of monitoring components;

   c. Maintenance of site equipment; and

   d. Replacement schedule for equipment and installed components.

5. Records and reporting mechanisms required:

   a. Daily operating logs;

   b. Laboratory records;

   c. Mechanism for reporting emergencies;

   d. Personnel and maintenance records; and

   e. Monthly/annual reports for Federal/State agencies.

   The O & M Plan shall be submitted with the Final Design Documents.

C. PROJECT SCHEDULE

The Permittee shall submit to the Director or designee for review and approval a detailed

Project Schedule for construction and implementation of the interim measure(s) which identifies timing for initiation and completion of all critical path tasks. The Permittee shall specifically identify dates for completion of the project and major interim milestones which are enforceable terms of this order. A Project Schedule shall be submitted simultaneously with the Final Design Documents.

D. FINAL DESIGN DOCUMENTS

The Final Design Documents shall consist of the Final Design Construction Drawings and Specifications (100 percent complete), the Final Draft O & M Plan, and the Project Schedule. The Permittee shall submit the final documents 100 percent complete with reproducible drawings and specifications. The quality of the design documents should be such that the Permittee would be able to include them in a bid package and invite contractors to submit bids for the construction project.

END OF APPENDIX C

APPENDIX D

INTERIM MEASURES CONSTRUCTION QUALITY ASSURANCE PLAN (CQAP)

A. CONSTRUCTION QUALITY ASSURANCE OBJECTIVES

In the CQA plan, the Permittee shall identify and document the objectives framework for the development of a construction quality assurance program including, but not limited to the following: responsibility and authority; personnel qualifications; inspection activities; sampling requirements; and documentation. The responsibility and authority of all organizations (*i.e.*, technical consultants, construction firms, *etc.*) and key personnel involved in the construction of the interim measure shall be described fully in the CQAP. The Permittee must identify a CQA officer and the necessary supporting inspection staff.

B. INSPECTION ACTIVITIES

The observations and tests that will be used to monitor the construction and installation of the components of the interim measure(s) shall be summarized in the CQA plan. The plan shall include the scope and frequency of each type of inspection. Inspections shall verify compliance with all environmental requirements and include, but not be limited to air quality and emissions monitoring records, waste disposal records (*e.g.*, RCRA transportation manifests), *etc*. The inspection should also ensure compliance with all health and safety procedures. In addition to oversight inspections, the Permittee shall conduct the following activities.

1. Preconstruction inspection and meeting:

   The Permittee shall conduct a preconstruction inspection and meeting to:

   a. Review methods for documenting and reporting inspection data;

   b. Review methods for distributing and storing documents and reports;

   c. Review work area security and safety protocol;

   d. Discuss any appropriate modifications of the CQAP to ensure that site-specific considerations are addressed; and

   e. Conduct a site walk-around to verify that the design criteria, plans, and specifications are understood and to review material and equipment storage locations.

   The preconstruction inspection and meeting shall be documented by a designated person and minutes should be transmitted to all parties.

2. Prefinal inspection:

   Upon preliminary project construction completion, the Permittee shall notify the Director or designee for the purposes of conducting a prefinal inspection. The prefinal inspection of the entire project may consist of a walk-through inspection of the entire project site. The inspection is to determine whether the project is

complete and consistent with the contract documents and the Director or designee approved interim measure. Any outstanding construction items discovered during the inspection shall be identified and noted. Additionally, treatment equipment shall be operationally tested by the Permittee. The Permittee shall certify that the equipment has performed to meet the purpose of and intent of the specifications. Retesting will be completed where deficiencies are revealed. The prefinal inspection report should outline the outstanding construction items, completion date for these items, and date for final inspection.

3. Final inspection:

Upon completion of any outstanding construction items, the Permittee shall notify the Director or designee for the purposes of conducting a final inspection. The final inspection may consist of a walk-through inspection of the project site. The prefinal inspection report will be used as a checklist with the final inspection focusing on the outstanding construction items identified in the prefinal inspection. Confirmation shall be made that outstanding items have been resolved.

C. SAMPLING REQUIREMENTS

The sampling and testing activities, sample size, sample and test locations, frequency of testing, acceptance and rejection criteria, and plans for correcting problems should be presented in the CQAP.

D. DOCUMENTATION

Reporting requirements for CQA activities shall be described in the CQAP. This plan shall include such items as daily summary reports, inspection data sheets, problem identification and interim measures reports, design acceptance reports, and final documentation. Provisions for final storage of all records shall be presented in the CQAP.

END OF APPENDIX D

APPENDIX E

REPORTS

A. PROGRESS

The Permittee shall at a minimum provide the Director or designee with signed, monthly interim measures progress reports containing:

1. A description and estimate of the percentage of interim measures completed;
2. Summaries of all findings;
3. Summaries of all changes made in the interim measures during the reporting period;
4. Summaries of all contacts with representatives of the local community, public interest groups or State government during the reporting period;
5. Summaries of all problems or potential problems encountered during the reporting period;
6. Actions being taken to rectify problems;
7. Changes in personnel during the reporting period; and
8. Projected work for the next reporting inspection reports, laboratory/monitoring data, etc.

B. INTERIM MEASURES WORK PLAN

The Permittee shall submit the Interim Measures Work Plan as described in Appendices A, B, C, and D.

C. FINAL DESIGN DOCUMENTS

The Permittee shall submit the Final Design Documents as described in Appendix C.

D. INTERIM MEASURES REPORT

At the "completion" of the construction of the project (except for long term operation, maintenance and monitoring), the Permittee shall submit an Interim Measures Implementation Report to the Director or designee. The Report shall document that the project is consistent with the design specification, and that the interim measures are performing adequately. The Report shall include, but not be limited to the following elements:

1. Synopsis of the interim measures and certification of the design and construction;
2. Explanation of any modification to the plans and why these were necessary for the project;
3. Listing of the criteria, established before the interim measures were initiated, for judging the functioning of the interim measures and also explaining any modifications to these criteria;
4. Results of facility monitoring, indicating that the interim measures will meet or

exceed the performance criteria; and

5. Explanation of the operation and maintenance (including monitoring) to be undertaken at the facility.

This report shall include the inspection summary reports, inspection data sheets, problem identification and corrective measure reports, block evaluation reports, photographic reporting data sheets, design engineer's acceptance reports, deviations from design and material specifications (with justifying documentation) and as-built drawings.

END OF APPENDIX E

APPENDIX F

REMEDIAL ACTION DECISION DOCUMENT (RADD)

STATE OF ARKANSAS

ARKANSAS DEPARTMENT OF ENVIRONMENTAL QUALITY

FINAL

Remedial Action Decision Document (RADD)

RCRA Permit 31H-RN1

Austin Powder Company
Calhoun County, Arkansas

August 2011

Arkansas Department of Environmental Quality (ADEQ)

REMEDIAL ACTION DECISION DOCUMENT (RADD)

Austin Powder Company
ARD093417525

1. INTRODUCTION

The Austin Powder Company (APC) facility is located in Calhoun County in Highland Industrial Park (HIP), approximately nine (9) miles east of the community of East Camden, Arkansas (see General Location Map in Attachment A). The facility is located in Section 13, Tl3S, R15W of the USGS Woodberry 7.5 minute quadrangle. APC leases industrial land from HIP which is surrounded by rural land consisting of timberland and sparse pastureland. The ground surface elevations range from one hundred eighty five (185) feet above Mean Sea Level (ft MSL) in the facility's northern section, to less than one hundred eighty (180) ft MSL in the facility's southern section.

This RADD contains the justification for ADEQ's final decision on all applicable Corrective Measures Implementation (CMI) activities at the APC facility. This RADD also provided the opportunity for the public to comment, and serves as a companion to the RCRA Facility Investigation (RFI) and the administrative record.

APC proposed to conduct "Monitored Natural Attenuation (MNA) for a period of two (2) years" to address the shallow groundwater impacted with explosive constituents generated at Solid Waste Management Unit (SWMU) No.1- Open Burn/Open Detonation (OB/OD) Area. However; based on past onsite groundwater monitoring results, ADEQ believes there is very little natural attenuation occurring. Therefore, ADEQ opted to continue the current Groundwater Monitoring Plan up to five (5) years because the site currently passes all current risk-based uses. After this 5-year term, ADEQ will re-evaluate groundwater monitoring results to determine if an alternative corrective action approach is necessary. If at any time within this 5-year term, it is determined there is an increase in groundwater constituents of potential concern (COPC) values at the specified shallow groundwater monitoring wells, APC will immediately notify ADEQ and a determination will be made if an alternative corrective action approach is necessary at that time. APC will be directed to implement the requirements of the Corrective Measures Study (CMS) phase of RCRA Permit 31H, Module XII(b).

Public involvement is an important process for ultimately selecting the final remedies to be employed at the site for remediating releases to the environment of hazardous constituents. Since this RADD is an important decision document, the RADD was subject to public notice and comment to allow the public and all interested parties to raise all ascertainable issues concerning the remedies proposed at the facility, including options not addressed.

2. SITE BACKGROUND

Before APC began operations at the site, the location was part of the Shumaker Naval Ammunition Depot (NAD). The Shumaker facility was constructed in 1944 to manufacture and test munitions for the US Navy in World War II. This facility was shut down after World War II and then reopened for the Korean War. The Shumaker facility was permanently shut down by the US government in 1957. Brown Engineering Corporation (the predecessor of HIP) purchased a portion of the former Shumaker facility in 1961.

The APC facility produces explosive-based cast boosters used in the mining and road building industry. The manufacturing site consists of several production and storage buildings (formerly used by the Department of Defense as part of the former Shumaker Naval Ammunition Depot) to produce and store products at the plant, while one building is utilized as an office.

On August 3, 2004, ADEQ issued RCRA Permit 31H to APC to conduct open burning (OB) activities on reactive hazardous waste (D003) sited separately from the manufacturing facility. In this separate waste management leased area, APC utilizes RCRA permitted OB treatment units consisting of three (3) burn cages to open burn (destroy) off-specification explosives (TNT, PETN, RDX, and HMX) and combustible contaminated packaging. After burning (treatment), the remaining ash is containerized and shipped off-site to a Class D landfill for disposal. APC maintains a network of groundwater monitoring wells at the location of the burn cages to monitor the quality of the uppermost groundwater aquifer. A separate Open Detonation (OD) Area is also located a few yards south of the OB area which has been used to test explosives.

RCRA Permit 31H incorporated all the applicable corrective action requirements pursuant to the 1984 Hazardous and Solid Waste Amendments (HSWA). These HSWA obligations consist of four (4) phases: a Description of Current Conditions (DOCC) Report phase; a RCRA Facility Investigation (RFI) phase; a Corrective Measures Study (CMS) phase, and; a Corrective Measures Implementation (CMI) phase.

EPA Region 6 performed and produced a RCRA Facility Assessment (RFA) at the APC facility on June 28, 1991. This RFA identified five (5) individual Solid Waste Management Units (SWMUs) at the facility:

Table 1: RFA Identified SWMUs at APC

SWMU#	SWMU Description
1	Open Burn/Open Detonation (OB/OD) Area
2	Two Enclosed Water Recycling Systems
3	Two Portable Wastewater Tanks
4	Two Waste Accumulation Points
5	Four Old Catch Tanks and Basin Water System

Based on this investigation, the RFA recommended further study for SWMUs #1 and #5 under a RCRA Facility Investigation (RFI).

Pursuant to Module XII(b) of RCRA Permit 31H, APC generated a Description of Current Conditions (DOCC) Report, detailing the history of the onsite SWMUs at the facility. The DOCC was submitted to ADEQ in November 2004 and was approved by ADEQ in September 2005.

Pursuant to the RCRA Permit, APC submitted a subsequent RFI Work Plan to ADEQ in August 2005. The approved RFI Work Plan recommended "No Further Action" for SWMU #5- (Four Old Catch Tanks and Basin Water System), since this unit was previously closed and dismantled. This recommendation was approved when ADEQ officially approved the RFI Work Plan in June 2006. Based on this approval, only SWMU #1 required further investigation under the RFI investigative stage.

The approved RFI Work Plan involved APC taking soil, surface water, groundwater, and air monitoring samples at SWMU #1. In addition, APC replaced an existing groundwater monitoring well and added two (2) new additional groundwater monitoring wells. On May 31, 2007, APC submitted their original RFI Report to ADEQ. After revisions, ADEQ conditionally approved the RFI Report on October 19, 2009, requiring additional delineation of the existing shallow groundwater plume at the southern boundary of the facility (SWMU #1 impacts). APC subsequently submitted various addendums delineating the full extent of the shallow groundwater plume to the south and south-east of the APC leased property and non-APC leased property on the HIP site.

Based on a facility compliance inspection conducted in February 2009, it was discovered that APC was washing employee clothes, impacted with explosive constituents, onsite and discharging the wastewater into a septic system (with associated field lines) located adjacent to the facility's office. Based on this discovery, ADEQ issued APC a notification of a "newly discovered SWMU" (SWMU #6- Septic Tank System) on June 4, 2009. This newly discovered SWMU was incorporated into APC's RCRA operating Permit (31H) via a RCRA Class 3 permit modification in July 2009. This permit modification required an investigation be conducted for newly discovered SWMU #6.

Table 2: Newly Discovered SWMU at APC

SWMU#	SWMU Description
6	Septic Tank System

See Figures in Attachment B for maps of the specific investigation areas for the location of all applicable SWMUs at APC.

In August 2009, APC submitted an initial RFI Work Plan for SWMU #6- (Septic Tank System) which was approved by ADEQ in October 2009. ADEQ received the subsequent SWMU #6 RFI Report in January 2010, which detailed no explosive constituents present in the environmental media within the leach field. ADEQ approved this Report (and the Report's findings) on March 5, 2010. In addition, APC eliminated the washing of clothes (onsite), associated with the Septic Tank System, for employee uniforms.

The final RFI Report delineating the full extent of all contamination associated with SWMU #1 was approved by ADEQ on May 18, 2011.

3. SUMMARY OF SITE RISKS

The primary sources of constituents of potential concern (COPCs) at the APC site are associated with SWMU No. 1, in conjunction with site operations of the Open Burn/Open Detonation (OB/OD) Area. Releases of explosive and reactive waste generated from site operations have resulted in metals and explosive residuals present in on-site soils, surface water, and groundwater. Some of these constituents were above protective health-based screening criteria and area background concentrations. These COPCs were retained for further human health and ecological risk evaluations.

A Human Health Risk Assessment (HHRA) and a Screening Level Ecological Risk Assessment (SLERA) were performed to assess risks from exposure to site COPCs and are contained in the Environmental Assessment Report (Appendix A) and associated Tables (Appendix C) of the revised RCRA Facility Investigation (RFI) Report (2009). The media evaluated for the HHRA are surface soils which also included sediment from on-site storm water drainage ditches as surface soil since these areas only have occasional standing water. Subsurface soils, groundwater, and site ambient air was also assessed. Pooled site surface water from storm events was also evaluated for human health and ecological exposure risks. The HHRA considered non-cancer health effects and theoretical lifetime cancer risks (LCR) scenarios based on current and future use at the site. The SLERA assesses possible eco-toxicity of COPCs detected in surface soil and surface water and its effect on avian, aquatic, and terrestrial ecological habitats.

A. HUMAN HEALTH RISKS

Soils: Three metals/chemicals in surface soils and subsurface soils had detected concentrations above the industrial soil screening levels and/or the protection of groundwater soil screening levels and were retained as COPCs in the HHRA. These COPCs are arsenic, lead, and hexahydro-1, 3, 5-trinitro-1, 3, 5-triazine (RDX). Current and/or future receptors that were evaluated for exposures to direct contact with surface soil via the ingestion, dermal, and inhalation pathways are the site industrial worker and the adolescent trespasser. A current and/or future construction worker was also evaluated for direct contact with surface and subsurface soils at all depths for exposure through the ingestion, dermal, and inhalation pathways.

Industrial Worker: The non-cancer risk for the industrial worker resulted in a cumulative Hazard Index (HI) of 4.2 E-02 which is less than a hazard index of 1 acceptable by the United States Environmental Protection Agency (USEPA) demonstrating that adverse health effects are unlikely from exposures to COPCs in site surface soil for this receptor. The theoretical lifetime cancer risk (LCR) is 6.2E-06 which falls within USEPA's acceptable cancer risk range of 1E-06 to 1E-04 which indicates that cancer risk exposures to site COPCs in surface soil for this receptor are unlikely.

Construction Worker: The construction worker was evaluated for exposures to COPCs in surface and subsurface soils combined. The non-cancer cumulative HI is 4.5 E-02 which is less than a HI of 1 considered acceptable by the USEPA and indicates that health effects to exposure of

COPCs in soils are unlikely to this receptor. The theoretical LCR is 2.9E-07 and is below the USEPA acceptable cancer risk range of 1.0E-6 to 1.0E-04 demonstrating that cancer risk exposure to site surface and subsurface soil COPCs for this receptor is unlikely.

Trespasser (adolescent): An adolescent trespasser scenario was evaluated for exposure to surface soils. The HI for the trespasser was 1.7E-02 which is less than a HI of 1 considered acceptable by USEPA and demonstrates that health effects from exposure to site surface soil COPCs are unlikely to occur for this receptor. The LCR is 1.1E-06 which falls within the USEPA cancer risk range of 1.0E-06 to 1.0E-04 indicating that cancer risk to the trespasser from exposure to site COPCs in surface soil is unlikely to occur for this receptor. The APC site is located within the Highland Industrial Park (HIP) property boundaries which are fenced, gated, and manned by Security making it difficult for an adolescent trespasser to gain access to the site.

Lead Evaluation in Surface and Subsurface Soils: Worker exposure to lead deposited within site soils was evaluated using USEPA's Adult Lead Model (ALM). The ALM takes into account intake and uptake components of lead exposure and allows for site specific data to be entered into the model for an estimation of blood lead concentrations which is an indicator of lead exposure for current and potential future populations. This model is based on a conservative potential fetal blood level concentration in women exposed to lead in soil based on a geometric mean (GM). EPA guidance calls to limit childhood blood lead risk exposure to not exceed 10ug/dL (micrograms/deciliter) and equate a probability for this exceedance to occur to less than 5%. Based on the model inputs for the APC site, a determination of the fetal blood level for lead based on the geometric mean (PbBfetal-GM) calculated to be 1.69 ug/dL. A probability that a fetal blood level would exceed 10 ug/dL from exposure to lead in surface soils is 0.9% and the probability for subsurface soil exposure is 0.8%. These results indicate that lead detections in SWMU No. 1 soils do not appear to pose a significant risk to potential non-residential receptors (industrial workers/construction workers).

Groundwater: Five metals/chemicals were above the USEPA maximum concentration levels (MCLs) and/or the Tap-water screening levels for groundwater and were retained as COPCs for further evaluation. These COPCs are lead, RDX, 2, 4, 6-trinitrotoulene (TNT), perchlorate, and tetrachloroethylene (PCE). Perchlorate and PCE are considered COPCs unrelated to the Austin Powder operations. Two receptors were evaluated for possible exposure to site groundwater based on current and/or future exposures through the ingestion, dermal, and inhalation pathways. These receptors are the construction worker possibly exposed to site groundwater through site excavation activities and an exposure scenario based on a hypothetical adult residential groundwater consumer.

Construction Worker: The non-cancer risks for the construction worker potentially exposed to site groundwater are 1.3E-02 which is below an HI of 1 considered acceptable by USEPA and indicates that non-cancer health effects are unlikely for this receptor. The theoretical LCR for the construction worker is 5.7E-07 which is below the acceptable USEPA cancer risk range of 1.0E-06 to 1.0E-04 indicating that cancer risks from exposure to site groundwater are unlikely for this receptor.

Hypothetical Residential Groundwater Consumer (Adult): The non-cancer cumulative HI for the groundwater consumer is 5.06 exceeding the USEPA hazard index of 1 representing a slight possibility that adverse health effects could occur to this receptor. This non-cancer risk is driven by exposure to TNT via the ingestion pathway. The theoretical cumulative LCR for this receptor is 3.4E-04 which exceeds the USEPA acceptable cancer risk range of 1.0E-06 to 1.0E-04 and indicates a potential cancer risk. The cancer risk for this receptor is being driven by groundwater exposure to PCE via the ingestion and the inhalation pathways. The Austin Powder site is located within a secured and fenced industrial park and water to the site is supplied by a municipality. It is highly unlikely that a residential scenario would ever occur at this location.

Lead Evaluation in Groundwater: To evaluate exposure to lead in groundwater, the Integrated Exposure Uptake Biokinetic (IEUBK) model was used. The IEUBK is designed to model exposure from lead in various media with pharmacokinetic modeling to predict blood lead levels in infants to children up to 7 years old. The model allows for an estimation of plausible distribution of blood lead concentrations centered on the geometric mean blood lead concentration. From this distribution, the model calculates the probability that children's blood level concentrations will exceed the selected level of concern established by the Centers of Disease Control and Prevention (CDC) of 10 ug/dL. The predicted lead blood level for a child resident possibly exposed to groundwater on the Austin Powder site is 0.35 ug/dL; which is below the level of concern as defined by the CDC. As previously stated, it is highly unlikely that the Austin Powder site will ever be used for residential purposes.

Surface Water: Site surface water found in storm water drainage ditches and pooled on-site standing water was sampled and compared to the USEPA MCLs and/or tap water screening criteria for protection of human health. Only one chemical exceeded the associated screening level and was retained as a COPC for further evaluation. This chemical is RDX. Three receptors were evaluated based on current and/or future possible exposures to site surface water via the ingestion and dermal pathways. These receptors are the site industrial worker, the construction worker, and the trespasser.

Industrial Worker: The non-cancer HI for the industrial worker is 4.0E-04 which is below the acceptable USEPA hazard index of 1 which represents that non-cancer health effects from exposure to RDX in this media is

unlikely to occur for this receptor. The theoretical LCR is 4.2 E-08 which is below the USEPA cancer risk range of 1.0E-06 to 1.0E-04 which represents that cancer risks from exposure to RDX in this media are unlikely to occur for this receptor.

Construction Worker: The non-cancer HI for the construction worker is 1.0E-04 which is below the acceptable USEPA hazard index of 1 which indicates that adverse health effects from exposure to RDX in this media is unlikely to occur for this receptor. The theoretical LCR is 6.2E-10 which is below the USEPA acceptable cancer risk range of 1.0E-06 to 1.0E-04 indicating that cancer risks from exposure to RDX in this media are unlikely to occur for this receptor.

Trespasser: The non-cancer HI for the trespasser is 1.0E-04 which is below the acceptable USEPA hazard index of 1 which indicates that adverse health effects from site exposure to this media are unlikely for this receptor. The theoretical LCR is 4.6E-09 indicating that cancer risks from exposure to RDX in this media are unlikely to occur for this receptor.

Air: SWMU No. 1 is an Open Burn/Open Detonation (OB/OD) Area of the site where explosives and residual chemicals used and manufactured on site premises are tested and destroyed. During open burn and test detonations, process related COPCs could be released into ambient air producing a probability of inhalation exposure. Air sampling was performed at the OB/OD Area and samples were compared to Region VI Regional Screening Levels (RSLs) for ambient air, the National Ambient Air Quality Standards (NAAQS), and measured background levels to determine COPCs. One chemical (benzene) and one metal (zinc) were retained as COPCs and were further assessed in the HHRA. Zinc does not have sufficient toxicity data to perform an evaluation; therefore, only a single chemical (benzene) was assessed for a single pathway (inhalation) of exposure. Three receptors were chosen based on current and/or future use of the site and evaluated for exposure to site COPCs in ambient air via the inhalation pathway. These three receptors are the industrial worker, the construction worker, and the adolescent trespasser.

Industrial Worker: The hazard quotient (HQ) non-cancer risk for the industrial worker is lE-02 which is below the acceptable USEPA hazard quotient of 1 indicating that adverse health effects due to inhalation exposure to benzene in ambient air for this receptor are unlikely to occur. The theoretical LCR is 1.2E-06 which falls within the USEPA acceptable cancer risk range of 1.0E-06 to 1.0E-04 indicating that cancer risks due to inhalation of benzene for this receptor are unlikely to occur.

Construction Worker: The non-cancer risk HQ for the construction worker is 2.0E-03 which is below the USEPA acceptable HQ of 1 indicating that adverse health effects due to inhalation of benzene in ambient air for this receptor are unlikely to occur. The theoretical LCR is 7.6E-09 indicating that cancer risks due to inhalation of benzene for this receptor are unlikely to occur.

Adolescent Trespasser: The non-cancer HQ for the adolescent trespasser is 4.0E-04 which is below the USEPA acceptable HQ of 1 indicating that adverse health effects due to inhalation of benzene for this receptor are unlikely to occur. The theoretical LCR is 1.2E-08 which is below the USEPA cancer risk range of 1.0E-06 to 1.0E-04 indicating that cancer risks due to inhalation of benzene for this receptor are unlikely to occur.

B. ECOLOGICAL RISKS

The SWMU No. 1 Area is located on a six (6) acre tract of land leased from the Highland Industrial Park. The Open Burn (OB) area is a raised, level mounded area approximately 30 feet by 50 feet in size. The Open Detonation (OD) area is approximately 60 feet by 100 feet in size. There is a narrow strip of pine trees that divide the two distinct areas. Little or no habitat currently exists in these two areas due to vegetation removal from site activities. Outlying peripheral areas of the site are primarily pine forest which could provide habitat or food chain sources for avian species (birds), small mammals (raccoons), and terrestrial wildlife (deer). The site has four drainage ditches which channel storm water during periods of heavy precipitation. No hydrophobic vegetation, ordinary high-water marks, or unconsolidated bottoms were observed within the four channels; therefore, it is unlikely that the drainage channels would provide suitable habitat for freshwater benthic communities or aquatic species.

Mechanisms of transport for site contamination being evaluated at the APC OB/OD Area are soil pathways and surface water run-off. Representative receptors in the general vicinity of the site may consist of: soil vegetation (plants), soil invertebrates (detritivores), birds (herbivores, omnivores, and carnivores), mammals (herbivores, omnivores, and carnivores), reptiles and amphibians (herbivores, omnivores, and carnivores). A baseline plant survey has not been conducted to profile the plant community at the site. Ecological receptors may become exposed to site COPC's by direct contact with soils and drinking water sources and indirectly by ingestion of food chain sources. Based on current and historical site conditions, potential risk, and the likelihood that adverse effects could occur to ecological receptors; the ingestion pathway was chosen for the protection of terrestrial communities as a representative assessment endpoint for ecological evaluation at the APC site.

To assess site COPC's, the maximum concentrations of site contaminants were compared to Region IV and Region V ecological screening values (ESVs) for surface soil, and/or No Observed Adverse Effect Levels (NOAELs) derived from toxicological studies. Concentrations were also compared to natural background levels for this region. Ecological risks were estimated numerically by using the hazard quotient (HQ) approach. The HQ is a ratio which can be used to estimate if potential risks of harmful effects can be contributed to specific site contaminants.

Surface Soils: Because of the age of the soil analytical sampling data (1993) and the site corrective actions undertaken throughout recent years by the APC facility to minimize migration of contaminants from the

OB/OD unit, a refinement of the SLERA was applied. It was determined that the 1993 data did not represent current site conditions. More current analytical surface soil data from the 2006 and 2008 sampling events was compared to screening criteria and background levels to determine COPC's and respective hazard quotients. Two metals (cadmium and total chromium) were above Region IV and Region V ESVs respectively for surface soils and retained as ecological COPCs. HQ's of 2.75 and 60 respectively were calculated for these two COPCs. These HQ's are above the acceptable USEPA Ecological HQ of 1 which indicates that adverse effects from exposure to cadmium at 2.75 are slight and exposure to chromium at 60 may be likely to occur for site ecological receptors. Natural soil backgrounds levels for chromium in Arkansas have been documented at 38 mg/kg.

Surface Water: Site surface water analytical data was also refined as noted above for site surface soils. The only constituent selected above applicable screening criteria and therefore retained as a COPC was lead resulting in a HQ of2.5 which is above the acceptable USEPA Ecological HQ of 1. This HQ indicates that a slight chance of adverse effects from exposure to lead may occur for site ecological receptors.

SLERA Conclusions: Comparisons of eco-toxicity screening values to maximum chemical concentrations detected in surface soil and surface water at SWMU #1 and the lack of viable habitat at the APC facility indicates that these chemicals/metals are unlikely to be associated with significant terrestrial toxicity.

Rare, Threatened, and Endangered Species: The Arkansas Natural Heritage Commission (ANHC) was contacted for a file review of rare, threatened, and endangered species. There were no records on file for the occurrence of rare plants, animals, outstanding natural communities, natural or scenic rivers, or other elements of special concern within a one mile radius of the Austin Powder facility.

4. SUMMARY OF REMEDIAL APPROACH

The uppermost groundwater aquifer is impacted by explosive constituents but currently is not utilized by HIP or APC. The impacted shallow groundwater plume is located entirely on HIP property (owner) (part of which is located in the OB/OD Area (SWMU #1) which APC has leased from HIP). Thus, at its current use, the site passes all current risk-based criteria. In addition, the current site has no significant ecological receptors. Continued shallow groundwater monitoring will ensure that the impacted groundwater plume is not expanding onsite and/or offsite. After a five (5) year groundwater monitoring period, ADEQ will re-evaluate groundwater monitoring results to determine if an alternative corrective action (remedial) approach is necessary. Prior re-evaluation may occur if ADEQ has been notified by APC of an increase in groundwater COPC values at any of the shallow groundwater monitoring wells being monitored.

Based on this decision, APC is to begin shallow groundwater monitoring activities on the HIP property utilizing groundwater monitoring wells MW-11, MW-12, MW-14, MW-15,

MW-17, and MW-18 on a semi-annual basis for a period of five (5) years for the following COPCs: RDX, 2,4,6-trinitrotoluene, 4-amino-2,6-dintrotoluene, 2-amino-4,6-dinitrotoluene, and HMX.

APC will submit Semi-Annual Groundwater Monitoring Reports with the findings of the sampling activity to ADEQ during the five (5) year period. APC will make comparisons of the newly acquired groundwater sampling data against historical groundwater sampling data. If it is determined there is an increase in groundwater COPCs values, APC will immediately notify ADEQ and a determination will be made if an alternative corrective action approach is necessary at that time. APC will be directed to implement the requirements of the Corrective Measure Study (CMS) phase of RCRA Permit 31H, Module XII(b).

At the end of the five (5) year period, APC will submit a 5-year Summary Report of the groundwater monitoring sampling activity findings for the total five (5) year period. Within the 5-year Summary Report, APC will make comparison of the newly acquired groundwater sampling data against historical groundwater data. After the 5-year term, ADEQ will re-evaluate if additional corrective action alternatives are necessary. Prior re-evaluation may occur if ADEQ has been notified by APC of an increase in groundwater COPC values at any of the shallow groundwater monitoring wells being monitored. Refer to the Groundwater Monitoring Well Location Map in Attachment C.

5. SUMMARY OF ALTERNATIVES CONSIDERED IN CMS

A. SURFACE SOILS

Based on the conclusions of the approved human and ecological EA, there is no risk to human health or to ecological receptors from surface soils impacted with COPCs at the facility. Based on this site-specific risk-based evaluation, ADEQ did not require APC to produce a Corrective Measures Study (CMS) to evaluate remedy alternatives for surface soils.

B. SUBSOILS

Based on the conclusions of the approved human and ecological EA, there is no risk to human health or to ecological receptors from subsoils impacted with COPCs at the facility. Based on this site-specific risk-based evaluation, ADEQ did not require APC to produce a CMS to evaluate remedy alternatives for subsurface soils.

C. GROUNDWATER

Based on the conclusions of the approved human and ecological EA, there is no risk to human health or to ecological receptors from impacted shallow groundwater impacted with COPCs at the facility. Based on this site-specific risk-based evaluation, ADEQ did not require APC to produce a CMS to evaluate remedy alternatives for shallow groundwater at this time. Refer to Section 4 above.

6. PROPOSED/RECOMMENDED REMEDIES

A. SURFACE SOILS

No Further Action (NFA); based on the conclusions of the approved human and ecological EA determining that there is no risk to either human health or the environment.

B. SUBSOILS

No Further Action (NFA); based on the conclusions of the approved human and ecological EA determining that there is no risk to either human health or the environment.

C. GROUND WATER

Based on the conclusions of the approved human and ecological EA, there is no current risk to either human health or the environment from impacted shallow groundwater from SWMU #1. However, ADEQ is implementing a five (5) year groundwater monitoring plan on the shallow impacted groundwater. After this term, ADEQ will re-evaluate if corrective action alternatives are necessary. Prior re-evaluation may occur if ADEQ has been notified by APC of an increase in groundwater COPC values at any of the shallow groundwater monitoring wells being monitored. Refer to Section 4 above.

7. EVALUATION OF THE PROPOSED REMEDY AND ALTERNATIVES

Based on the results of the human and ecological EA (depicting no risk), ADEQ has determined no proposed remedies or alternatives are required at this specific time. However; ADEQ elected to implement a shallow groundwater monitoring plan for a period of five (5) years. After this term, ADEQ will re-evaluate if corrective action alternatives are necessary. Prior re-evaluation may occur if ADEQ has been notified by APC of an increase in groundwater COPC values at any of the shallow groundwater monitoring wells being monitored. If so, a full evaluation of future proposed remedies and alternatives would be required. Refer to Section 4 above.

8. REMEDIAL ACTION LEVELS

A. SURFACE SOILS

All releases to surface soils at SWMU #1 were evaluated pursuant to a risk-based evaluation. All applicable COPCs were evaluated and only arsenic, lead, and the explosive compound, RDX exceeded risk-based screening levels. These specific constituents were then fully evaluated under a site-specific EA. The conclusions of the EA indicated all impacts for surface soil were well within acceptable risk-based criteria.

Based on the above risk-based analysis, no remedial action levels were required to be developed for surface soils.

B. SUBSOILS

All impacted subsurface soil at SWMU #1 was evaluated in conjunction with surface soils. See Section 8.A, above.

C. GROUND WATER

All releases to shallow groundwater at SWMU #I were evaluated pursuant to a

risk-based evaluation. All applicable COPCs were evaluated and only lead, perchlorate, PCE and the explosive compounds, RDX and TNT exceeded risk-based screening levels. These specific constituents were then fully evaluated under a site-specific Risk Assessment. The Risk Assessment determined that a hypothetical resident consuming shallow groundwater passed lead modeling criteria, but exceeded the cumulative cancer and non-cancer risks for perchlorate, PCE, RDX and TNT. Perchlorate and PCE are considered COPCs unrelated to Austin Powder operations. Risks associated with a hypothetical residential scenario are highly unlikely at the Austin Powder site. The APC site is located within an industrial park which has water serviced by a local municipality. The Park is fenced and has restricted gated access manned by security personnel. The extent of shallow groundwater contamination has been determined for the Austin Powder site and is confined within the HIP property.

Although the shallow groundwater impacts at SWMU #I are within acceptable risk-based criteria, the remedial action levels for this shallow groundwater is set as background (for naturally occurring constituents) or the applicable drinking water requirements.

9. JUSTIFICATION FOR SELECTIONS

A. SURFACE SOILS

The justification of NFA for surface soils was based on the conclusions of the approved human and ecological EA depicting no risk to either human health or the environment from impacted surface soils.

B. SUBSOILS

The justification of NFA for subsoils was based on the conclusions of the approved human and ecological EA depicting no risk to either human health or the environment from impacted subsurface soils.

C. GROUND WATER

Based on the conclusions of the approved human and ecological EA, there was no risk to either human health or the environment from impacted shallow groundwater (originating from SWMU #1).

APC proposed to conduct "Monitored Natural Attenuation (MNA) for a period of two (2) years" to address the groundwater impacted with explosive constituents generated at Solid Waste Management Unit (SWMU) No. 1, Open Burn/Open Detonation (OB/OD) Area. However; based on past onsite groundwater monitoring results, ADEQ believes there is very little natural attenuation occurring. Therefore, ADEQ has determined to continue the current Groundwater Monitoring Plan up to five (5) years, in association of the fact the site currently passes all current risk-based uses. After this 5-year term, ADEQ will re-evaluate groundwater monitoring results to determine if an alternative corrective action approach is necessary.

Based on this decision, APC is to begin shallow groundwater monitoring activities for a period of five (5) years. After this time, ADEQ will reevaluate if additional corrective action alternatives are necessary. Refer to Section 4 above.

10. SELECTED REMEDY SITE PLAN

No comments were received by ADEQ during the required public comment period. Although there is a potential increased risk to ecological receptors at SWMU No. 1 at the APC facility, there is a lack of viable habitat within this vicinity and the COPC concentrations are unlikely to be associated with any significant terrestrial toxicity (Refer to Section 3- Summary of Site Risks).

Based on the above, ADEQ has opted to require groundwater monitoring at Solid Waste Management Unit (SWMU) No. 1 -Open Burn/Open Detonation (OB/OD) Area for the following groundwater monitoring wells: MW-11, MW-12, MW-14, MW-15, MW-17, and MW-18 on a semi-annual basis for the following COPCs: RDX, 2,4,6-trinitrotoluene, 4-amino-2,6-dintrotoluene, 2-amino-4,6-dinitrotoluene, and HMX.

These wells will be sampled for a period of five (5) years. At the end of the five (5) year period, APC will submit a 5-year Summary Report of the groundwater monitoring sampling activity findings for the total five (5) year period. Within the 5-year Summary Report, APC will make comparison of the newly acquired groundwater sampling data against historical groundwater data. After the 5-year term, ADEQ will re-evaluate if additional corrective action alternatives are necessary. Prior re-evaluation may occur if ADEQ has been notified by APC of an increase in groundwater COPC values at any of the shallow groundwater monitoring wells being monitored. Refer to the Groundwater Monitoring Well Location Map in Attachment C.

11. EFFECTIVENESS MONITORING PROGRAM

APC is to begin shallow groundwater monitoring activities utilizing groundwater monitoring wells MW-11, MW-12, MW-14, MW-15, MW-17, and MW-18 on a semi-annual basis for the following COPCs: RDX, 2,4,6-trinitrotoluene, 4-amino-2,6-dinitrotoluene, 2-amino-4,6-dinitrotoluene, and HMX for a period of five (5) years.

APC will submit Semi-Annual Groundwater Monitoring Reports with the findings of the sampling activity to ADEQ during the five (5) year period. Within the Semi-Annual Groundwater Sampling Reports, APC will make comparisons of the newly acquired groundwater sampling data against historical groundwater sampling data. If it is determined there is an increase in groundwater COPC values, APC will immediately notify ADEQ and a determination will be made if an alternative corrective action approach is necessary, at that time. APC will be directed to implement the requirements of the Corrective Measure Study (CMS) phase of RCRA Permit 31H, Module XII(b).

At the end of the five (5) year period, APC will submit a 5-year Summary Report of the groundwater monitoring sampling activity findings for the total five (5) year period. Within the 5-year Summary Report, APC will make comparison of the newly acquired groundwater sampling data against historical groundwater data. Refer to the Groundwater Monitoring Well Location Map in Attachment C.

ADEQ elected to implement this shallow groundwater monitoring plan for a period of five (5) years. After the 5-year term, ADEQ will re-evaluate if corrective action alternatives are necessary. If ADEQ finds an increase in groundwater COPC values at any time in the shallow groundwater monitoring wells, a full evaluation of future proposed remedies and alternatives would be required.

12. COMMUNITY PARTICIPATION

Public involvement is an important process for ultimately selecting the final remedies to be employed at the site for remediating releases to the environment of hazardous constituents. Since this RADD is an important decision document, the RADD was subject to public notice and comment to allow the public and interested parties to raise all ascertainable issues concerning the remedies proposed at the facility, including options not potentially addressed.

The Notice of the RADD for APC was published in the South Arkansas Sun on July 14, 2011. Individuals were afforded the opportunity to review the RADD and the administrative record in the ADEQ Records Management Section, Arkansas Department of Environmental Quality Building, 5301 Northshore Drive, North Little Rock, Arkansas. In addition, the RADD was also available for review at the Calhoun County Library, located at 109 South 2nd Street in Hampton, Arkansas.

No comments were received during the required public comment period.

Documents comprising the administrative record include:

1. Remedial Action Decision Document (RADD)
2. Final RFI Report (containing Environmental Assessment) and RFI Report Addendum
3. Fact Sheet
4. Public Notice

The Department has now made a final decision on the RADD after the public comment period. ADEQ, in response to written requests, would have held a public hearing if such a hearing might have clarified issues concerning the RADD. Any request for a hearing was to include the requestor's name and address and shall state the nature of the issues to be raised in a hearing. ADEQ would have issued a public notice of a hearing at least 30 days prior to the scheduled hearing.

Any individuals, including the Applicant, who wished to comment, request a public hearing or add their names to the mailing list concerning ADEQ decisions relating to the RADD, were to do so by hand delivering or mailing written comments, along with their name and mailing address to:

Clyde E. Rhodes, Jr, Chief
Hazardous Waste Division
Arkansas Department of Environmental Quality
5301 Northshore Drive
North Little Rock, AR 72118-5317
Web site: http://www.adeq.state.ar.us

All comments and request for a public hearing must have been received by 4:30 P.M. on August 12, 2011.

Submitting written comments to ADEQ or making oral statements on the record at a public hearing on the RADD decision provides individuals with legal standing to appeal a final Department decision. Comments supporting or opposing the tentative decision will provide legal standing. Only parties with legal standing may appeal the decision.

13. COORDINATION WITH OTHER DIVISIONS/AGENCIES

It is important to involve/inform other divisions of ADEQ and other agencies in the development of a RADD, as applicable. To keep EPA informed of all corrective action work, EPA Region 6 was provided a copy of the Public Notice and RADD for review and comment.

INTERNAL COORDINATION

ADEQ Divisions	Consulted or Informed	Sent Notice of Decision
Water	Yes	Yes
NPDES	Yes	Yes
Air	Yes	Yes
Solid Waste	Yes	Yes
Regulated Waste Storage Tanks	No	No
Technical Services and Environmental Preservation	Yes	Yes
Mining	No	No

EXTERNAL COORDINATION

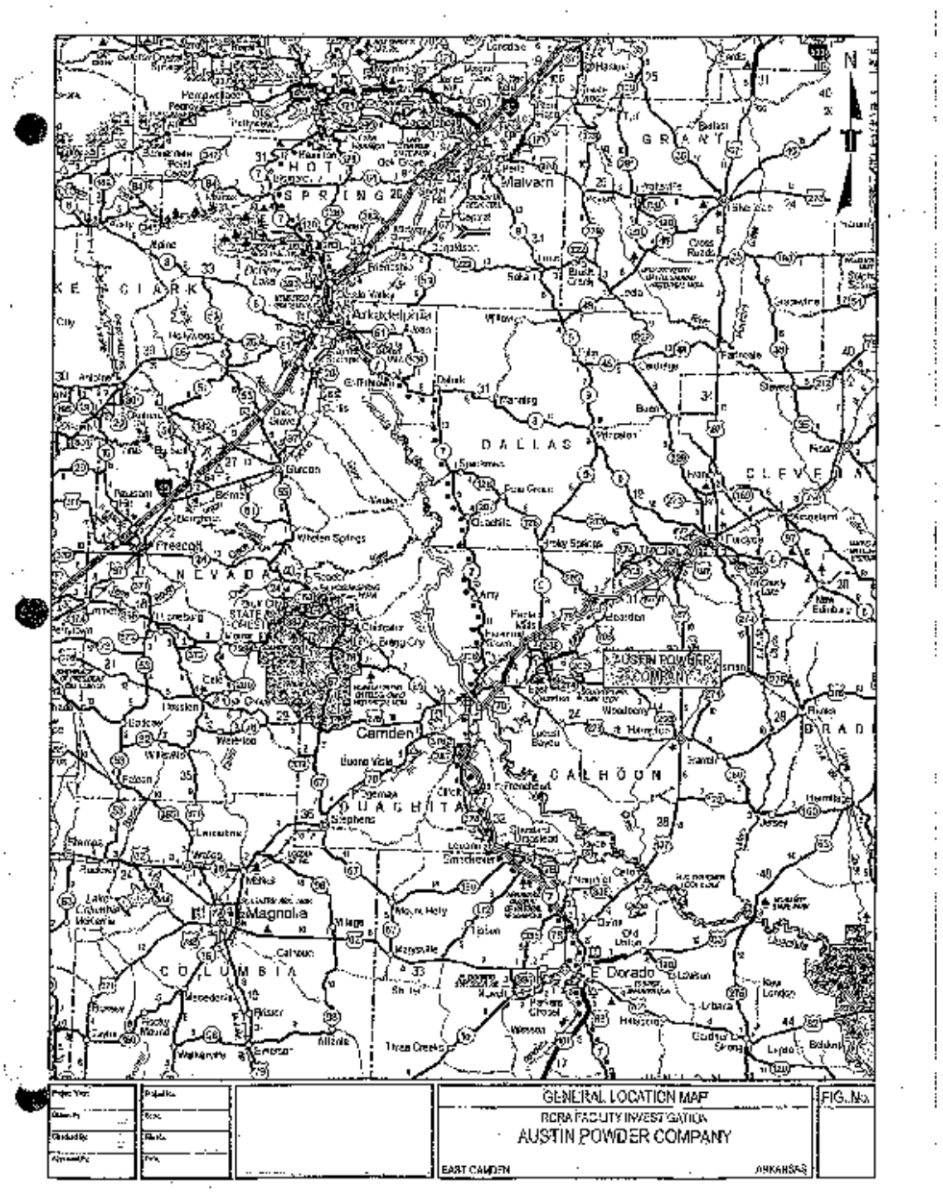
Other State and Federal Organizations	Consulted or Informed	Sent Notice of Decision
EPA, Region 6	Yes	Yes
Office of Emergency Services	No	No
AR Department of Health	Yes	Yes
AR State Clearinghouse	No	No
AR State Historic Preservation	No	No
AR Natural Heritage Commission	No	No
AR Game and Fish Commission	No	No
U.S. Army of Engineers	No	No
AR Soil and Water Conservation	No	No
AR Geological Commission	No	No

The RADD was sent all applicable branches of the Hazardous Waste Division, and to all divisions and agencies listed above.

End of RADD

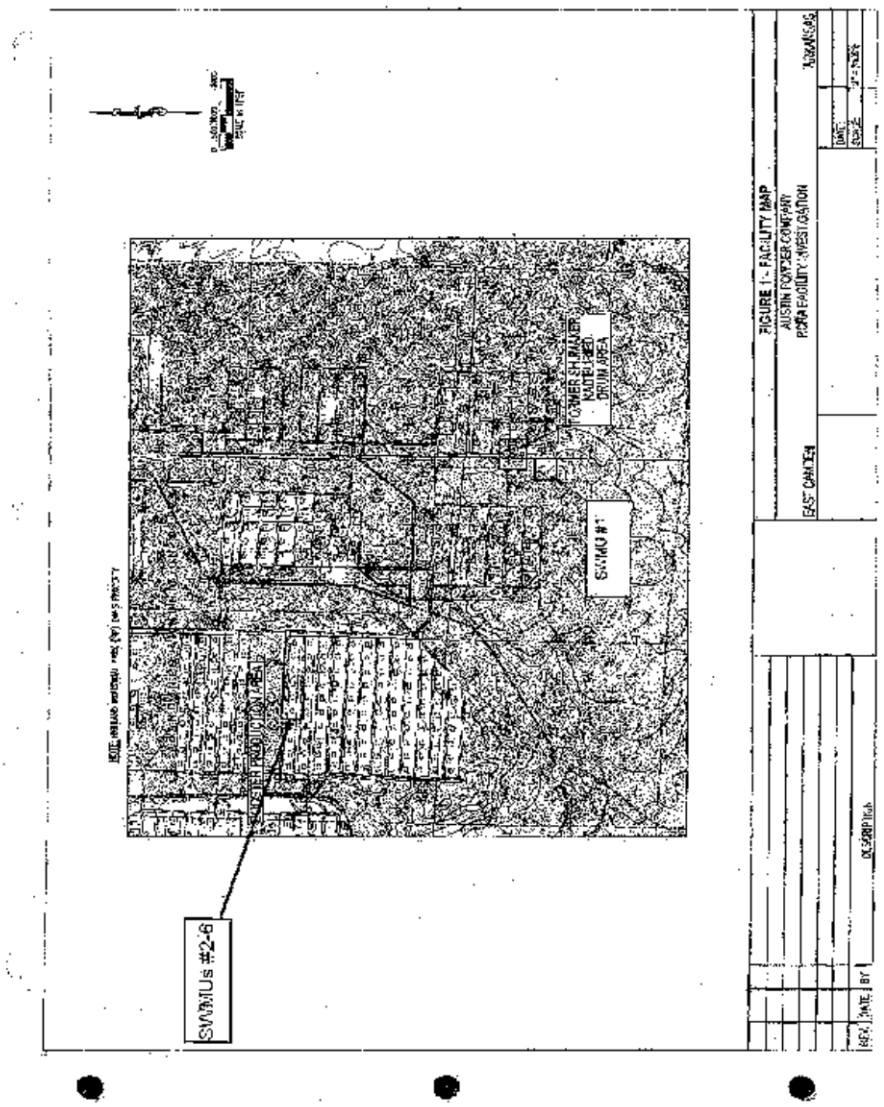
Attachment A1

General Facility Map


N
Malvern
DALLAS
CLEVELAND
Camden
CALHOUN
Magnolia
COLUMBIA
El Dorado
AUSTIN POWDER COMPANY
GENERAL LOCATION MAP
RCRA FACILITY INVESTIGATION
AUSTIN POWDER COMPANY
EAST CAMDEN
ARKANSAS
FIG. No.

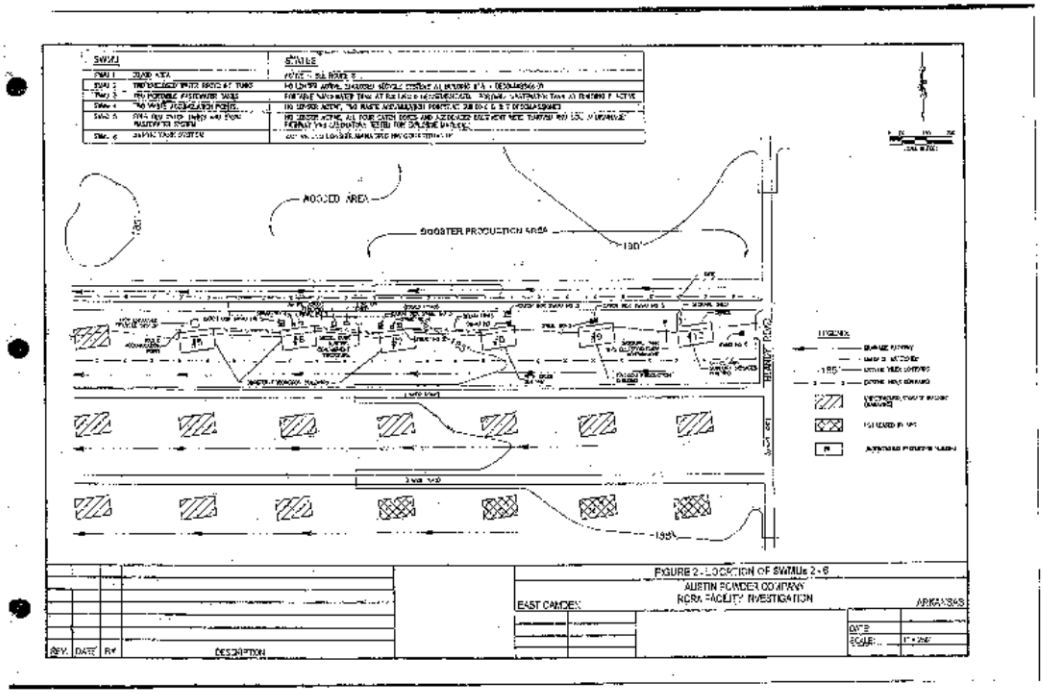
Attachment B1

Site Specific SWM Maps


SWMUs #2-6
SWMU #1
COMMERCIAL MAJOR MOTHBALLED DRUM AREA
FIGURE 1 - FACILITY MAP
AUSTIN POWDER COMPANY
EAST CANTON

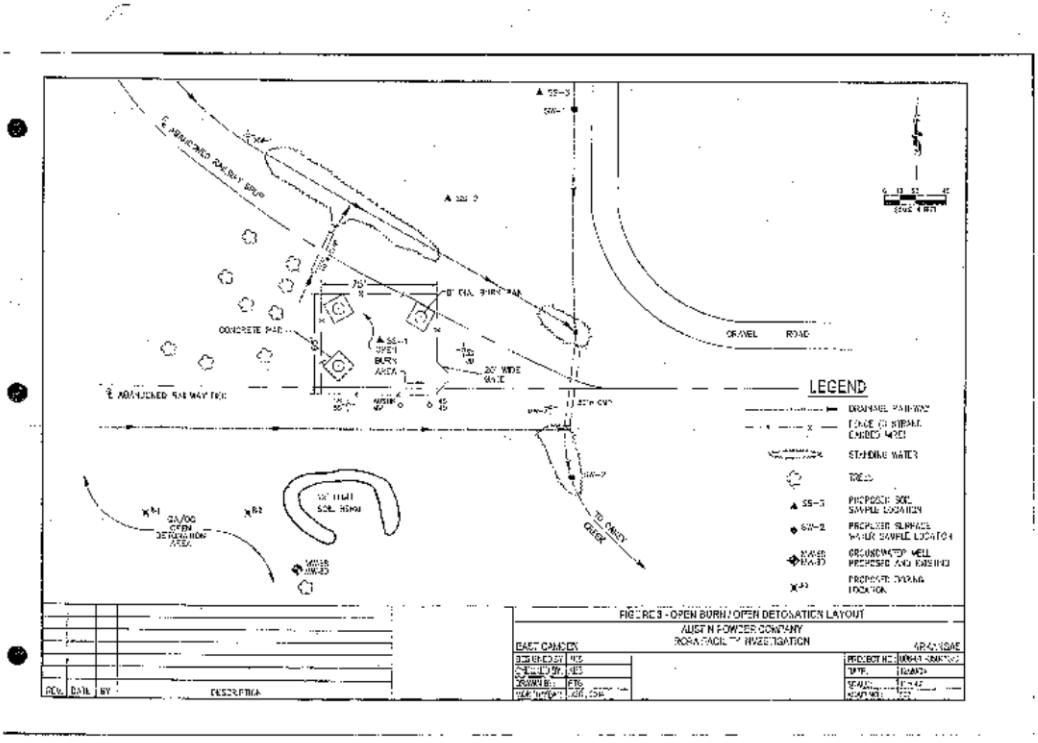
Attachment B2

Site Specific SWM Maps


SWMU
STATUS
BOOSTER PRODUCTION AREA
130'
195'
LEGEND
FIGURE 2 - LOCATION OF SWMUs 2 - 6
AUSTIN POWDER COMPANY
RCRA FACILITY INVESTIGATION
EAST CANDEN
ARKANSAS
REV. DATE BY
DESCRIPTION
DATE
SCALE: 1" = 200'

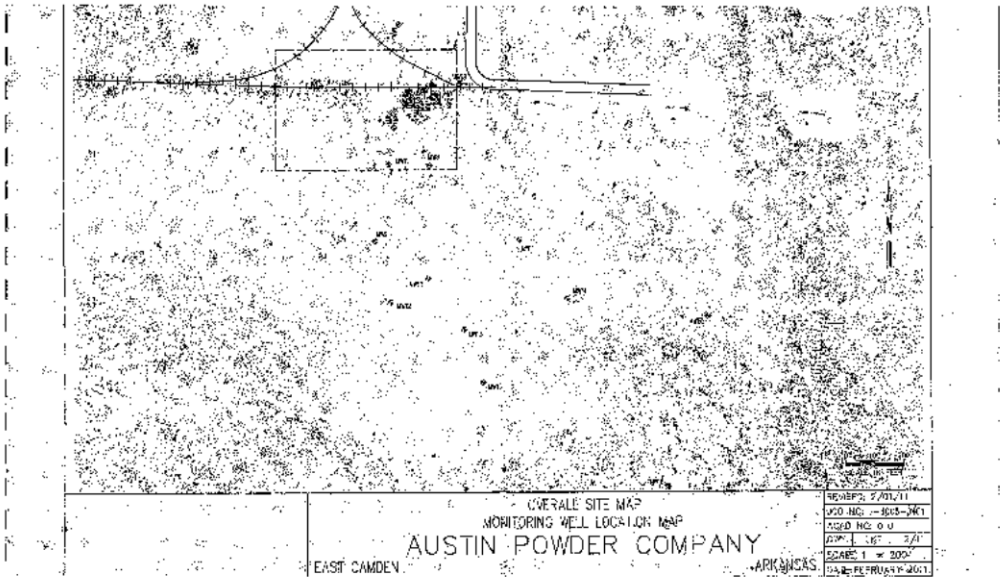
Attachment B3

Site Specific SWM Maps


LEGEND
GRAVEL ROAD
TO CAMEY CREEK
FIGURE 3 - OPEN BURN / OPEN DETONATION LAYOUT
AUSTIN POWDER COMPANY
EAST CAMDEN
ARKANSAS

Attachment C1

Monitoring Well Map


OVERALL SITE MAP
MONITORING WELL LOCATION MAP
AUSTIN POWDER COMPANY
EAST CAMDEN
ARKANSAS

MODULE XIV- TREATMENT OF ENERGETIC WASTES

A. MODULE HIGHLIGHTS

Permittee has installed and is operating three (3) burn pans.

The open burning area of the open burn (OB) unit is a cleared area approximately 100 feet in diameter containing three (3) steel burn pans set 16 feet apart to prevent the possibility of sympathetic detonation. The pans are cut from reclaimed cylindrical tanks and have a bowl shaped bottom with a three and half (3.5) feet height topped by 8-foot high steel wire mesh cages of 3/8-inch wall thickness (the total height of each pan is 11.5 feet). Three steel support legs are welded to the side of each pan, and each pan has a !12-inch diameter drain hole drilled in the center of the bowl-shaped bottom. A metal plug is inserted in the hole during burning operations. A concrete pad with berms sits between the ground and each of the three the burn pans.

All of the explosives and explosive contaminated materials are burned within the steel burn pans to contain waste as it is treated. The burn pans also contain any molten materials and ash generated by the burning process. The ash, which does not meet any of the characteristics of hazardous waste, is removed from the pans after a suitable cooling period (at least 45 minutes) and placed in covered containers until transported to an approved solid waste landfill.

The types of wastes burned at this facility are listed below:

Waste Code	Description	Maximum Annual Quantity*
D003	Waste explosive material containing more than 3% explosives	10 Tons (20,000 lbs)
K044	Wastewater treatment sludge's from the manufacturing and processing of explosives. Includes polypropylene filters from wastewater recycling system	5,000 lbs
K045	Spent carbon from the treatment of wastewater containing explosives	5,000 lbs
N/A	Empty contaminated explosive shipping containers and bags containing less than 3% explosives	10,000 lbs

* Please note that daily quantity limits also apply.

B. GENERAL

1. All plans and schedules required by this Permit are, upon approval by ADEQ, incorporated into Permit Module XIV, Condition B., General. Since required items are essential elements of this permit, failure to submit any of the required items or submission of inadequate or insufficient information may subject the Permittee to enforcement action under the Arkansas Hazardous Waste Management Act (A.C.A. §8-7-201 *et seq.*) which may include fines, suspension, or revocation of this permit. The Permittee may submit written requests for extensions of due dates for submittals to ADEQ for review, but such requests must be submitted to ADEQ at least thirty (30) calendar days prior to the

expiration of the stipulated submittal date.

2. Permittee submitted to ADEQ a report which contains the following in Section J of the Part B Application:

   a. A statement of certification that for each waste specified in Permit Module XIV, Condition C., Permitted and Prohibited Waste Identification, open burning is the only practical and generally approved treatment method available and that these wastes cannot be practically treated or incinerated in any other manner which would provide better control of emissions to the environment;

   b. Documentation from sources including, but not limited to, commercial hazardous waste incinerator operators, explosive and chemical manufacturing industry representatives, academic sources, etc., that open burning is the only reasonable approved method of treatment for each hazardous waste specified in Permit Module XIV, Condition C; and

   c. Reserved

3. The list of wastes specified in Permit Module XIV, Condition C., shall be certified annually as described above and the report shall be submitted to ADEQ for approval no later than the effective date of this permit every year.

4. Criteria for a modification of the *List of Wastes That May Be Treated* include but are not limited to the following:

   a. If there is a determination that open burning of any of the wastes threatens human health and the environment such wastes shall be removed from the *List of Wastes That May Be Treated*; or

   b. If other practical and generally approved method of treatment can be used which are more protective of human health and the environment such waste shall be removed from the *List of Wastes That May Be Treated*.

5. All open detonation activities to treat hazardous wastes are prohibited by this permit. Any unplanned open detonation of hazardous waste shall be reported to ADEQ within twenty-four (24) hours in accordance with the requirements of Module I, Condition E.l4 of this Permit.

6. The facility must ensure it follows APC&EC Regulation No. 23 Section 262.34 to avoid storing hazardous waste in excess of the generator requirement.

7. Engineering reports.

   a. The Permittee shall within thirty (30) calendar days of the effective date of this permit submit to the ADEQ for approval a report certified by an Arkansas registered engineer that all equipment and structures in the OB unit are in compliance with this permit.

   b. The engineering report in the condition above shall also be submitted annually no later than the effective date of this permit every year.

C. PERMITTED AND PROHIBITED WASTE IDENTIFICATION

1. The Permittee may open burn the following wastes subject to the terms of this permit and as described below:

Type of Unit	Description of Unit	Description of Hazardous Wastes	Hazardous Waste No.	Allowed Quantity
Open Burning	Three 8 Foot Diameter Burn Pans	Reactive Waste	D003, K044, K045	Should not exceed the maximum capacity of 0.05 short tons/day (100 lbs/day) for each of these pans.
Open Burning	Three 8 Foot Diameter Burn Pans	Empty contaminated explosive shipping containers and bags containing less than 3% explosives	N/A	

2. The Permittee is prohibited from treating hazardous waste that is not identified in Permit Module XIV, Condition C.1., Permitted and Prohibited Waste Identification.

3. Open burning of all non-reactive hazardous waste or non-hazardous waste except for non-hazardous waste listed in Permit Module XIV, Condition C.1 is prohibited.

D. DESIGN, CONSTRUCTION, AND OPERATING REQUIREMENTS

1. Open Burning in a Containment Device

   a. The Permittee has designed and constructed an open burning device in accordance with the design drawings and specifications contained in Section B of the Part B Application.

   b. Permittee shall operate and maintain the open burning device in accordance with the operating procedures contained in Section H of the Part B Application. The application includes detailed standard operating procedures (SOP) that specify how the wastes are to be treated. The SOP discusses loading/unloading procedures, how waste is to be placed in the unit, the amount to be burned per event, how the waste will be ignited, duration between burns including a minimum cool-down period, number of burns per day, ash/residue management, misfire procedures, and any other relevant information on procedures that could affect the quantity, quality, duration, or frequency of releases to the environment.

   c. Reserved

   d. The Permittee shall operate and maintain a precipitation cover in accordance with the operating practices contained in Section B of the Part B Application.

e. The Permittee shall manage accumulated precipitation in accordance with Section B of the Part B Application. The application discusses how precipitation will be collected, how it will be sampled and analyzed, how it is managed/treated, or other information that could affect infiltration during nonoperational periods or the quantity, quality, duration, or frequency of releases to the environment. If the Permittee discharges any accumulated water to surface, the Permittee shall comply with the requirements of APC&EC Regulation No. 6, APC&EC Regulation No.2, and Stormwater Permit ARR00B251.

f. The Permittee shall operate and maintain the open burning unit in order to minimize air emissions or exposure of people (onsite or offsite) to toxic or hazardous emissions in accordance with Section B of the Part B Application.

g. Ash and residues from the open burning unit shall be managed in accordance with Section C of the Part B Application and the following permit conditions

i. All ashes or waste remaining in the pans shall be removed within five (5) calendar days of the last burn series.

ii. The ashes and waste removed shall be stored in water proof containers which must be kept closed at all times except for adding or removing material with a dated label stating the contents. All residuals must be protected from surface water at all times as well as run-on and run-off.

iii. Two (2) representative ash samples will be taken twice a year. One sample should be representative of the ash from the open burning of D003 and the other sample should be representative of the ash from the open burning of the K044 or K045. These samples should be taken in the first week of April and November respectively. The Permittee shall provide the ADEQ a copy of the laboratory report within thirty (30) calendar days of the date the analytical report is issued.

2. Operating Conditions

a. Thermal treatment operations shall not be initiated or conducted during periods when atmospheric wind speeds equal or exceed five (5) miles per hour.

b. Thermal treatment operations shall not be initiated or conducted when electrical storms are present within a three (3) mile radius of the facility.

c. Thermal treatment operations shall be limited to daylight hours only between 8 a.m. and 5 p.m.; this includes physical preparation, transportation of explosives to the thermal units, and treatment and inspection after the cool-down period.

d. The Permittee shall observe a minimum of at least a forty-five (45) minute cool-down period following each bum.

e. Ash and residues from the thermal treatment units shall be managed in accordance with Permit Module II, Condition C., General Waste Analysis, and shall be removed at least within five (5) calendar days of the last bum series.

f. The Permittee shall record the date and time of all explosive detonations before, during, and after the thermal treatment process including unexpected explosions. The operating record shall include the thermal treatment unit where the explosion occurred, a detailed description of the wastes, the amount that exploded, and the reason for the explosion. ADEQ shall receive this notification of the incident within 24 hours.

g. Highly volatile and flammable liquids shall not be used to facilitate burning. Number 2 diesel fuel oil is acceptable.

h. The Permittee shall not treat high explosives containing initiators of any description.

i. The Permittee shall not mix bulk explosives for treatment.

j. A warning signal shall be operated prior to and during treatment operations, as described in the Operating/Work Instructions found in Section H of the Part B Application.

E. HANDLING AND STORAGE REQUIREMENTS

1. The Permittee shall handle and manage energetic waste in accordance with Section D of the Part B Application.

2. The Permittee shall store energetic wastes in accordance with Section B, C, and D of the Part B Application.

3. The Permittee shall submit to ADEQ for approval Sections B, C, and D of the Part B Application revised where necessary to ensure compliance with APC&EC Regulation No. 23 §262.34 within thirty (30) calendar days of the effective date of this Permit.

F. INSPECTION SCHEDULES AND PROCEDURES

1. The Permittee shall inspect the open burning unit in accordance with the Inspection Schedule, Section F of the Part B Application and shall complete the following as part of those inspections:

2. The Permittee shall thoroughly inspect the thermal treatment units and associated equipment and structures for leaks and spills. The leaks and spills shall be cleaned up immediately upon discovery; (i.e. contain spill, notify response parties, control ingress, etc...)

3. The Permittee shall inspect the thermal treatment area concrete pad and berm twice every week and shall repair any cracks or deteriorations immediately upon discovery; (i.e. take unit out of service, notify maintenance personnel, etc...)

4. All defects, deteriorations, or other malfunctions of the thermal units and associated structures (*e.g.*, precipitation covers or roofs, and thermal treatment unit concrete pads and curbs) discovered during the required inspections shall be repaired before additional treatment can occur in those units. Materials in units that are damaged and must be replaced shall be decontaminated prior to disposal according to the methods and procedures contained in Section I of the Part B Application; and

5. The inspection and maintenance schedules, results, and repair records shall become part of the operating record and shall be made available to ADEQ at all reasonable times.

G. PREVENTION OF UNINTENDED IGNITION OR REACTION OF WASTES

The Permittee shall follow the procedures contained in Section F of the Part B Application designed to prevent unintended ignition or reaction of wastes.

H. MONITORING REQUIREMENTS

1. Ground Water Monitoring

   The Permittee shall conduct ground water monitoring in accordance with Permit Module XI Condition C and Module XIV Condition K, or if required during implementation of Permit Module XIV Condition K, Soil and Surface Water Sampling with Contingency for Ground Water Investigation, included herein.

2. Air Monitoring

   The Permittee shall conduct air monitoring in accordance with Permit Module XIV, Condition J., Ambient Air Monitoring Program, and must submit an ambient air monitoring work plan within sixty (60) calendar days of the effective date of this permit.

3. Surface Water Monitoring

   The Permittee shall conduct surface water monitoring in accordance with Permit Module XIV, Condition K., and must submit a surface water monitoring work plan within sixty (60) calendar days of the effective date of this permit.

4. Soil Monitoring

   The Permittee shall conduct soil monitoring in accordance with Permit Module XIV, Condition K., and must submit a soil monitoring work plan within sixty (60) calendar days of the effective date of this permit.

I. ENVIRONMENTAL ASSESSMENTS

Due to the operation of the thermal treatment unit which may have adversely impacted the site environmental media conditions, within one hundred eighty (180) calendar days of the effective date of this Permit, the Permittee must demonstrate to the satisfaction of ADEQ that releases having adverse effects on human health or the environment because of migration of hazardous wastes or hazardous waste constituents into the ground water or subsurface environment and into the surface waters, wetlands, or the soil surface will be prevented. These demonstrations shall be achieved through the environmental

assessment process described in the Subpart X guidance manual developed by EPA's Office of Solid Waste, Permits, and State Programs Division, and the Permit Writer's Workgroup (RCRA; APC&EC Regulation No. 23, Section 264, Subsection X; Draft Permit Writers Guidance; April 1992).

A Second Environmental Assessment Work Plan detailing the activities necessary to demonstrate compliance with the Environmental Performance Standards of APC&EC Regulation No. 23 §264.601(a) and (b) shall be submitted to ADEQ within sixty (60) calendar days of the effective date of this Permit. After the Permittee submits the work plan, ADEQ will approve, disapprove, or modify the work plan in writing. If ADEQ approves the work plan, the Permittee shall implement the plan according to the schedule contained in the plan.

In the event of disapproval (in whole or in part) of the work plan, ADEQ will specify deficiencies in writing. The Permittee shall modify the plan to correct these deficiencies within thirty (30) calendar days of the receipt of notification of disapproval from ADEQ and shall submit a modified work plan to ADEQ for review. Upon receipt of written approval from ADEQ for the work plan, the Permittee shall implement the plan according to the schedule contained in the approved work plan.

A Second Environmental Assessment Report (EAR) shall be submitted to ADEQ according to a schedule proposed in the work plan. After the Permittee submits the report, the ADEQ will either approve or disapprove the report in writing. If ADEQ approves the report, the Permittee shall be notified of this determination in writing. The Permittee shall obtain written notification from ADEQ that the information presented in the Second Environmental Assessment Report demonstrated compliance with the Environmental Performance Standards codified at APC&EC Regulation No. 23 §264.601(a) and (b) prior to commencing thermal treatment operations or continuing to operate the existing unit.

If ADEQ determines that the demonstrations of the Second EAR do not comply with these regulatory requirements, the ADEQ will disapprove the report in writing. Within thirty (30) calendar days of receiving such notification, the Permittee shall submit to ADEQ a Facility Modification Work Plan, along with a schedule for submission of a final report, detailing plans to modify the construction details of the thermal treatment units, restrict certain wastes determined to be adversely affecting human health and the environment from thermal treatment, and to implement any measures necessary to comply with the Environmental Performance Standards codified at APC&EC Regulation No. 23 §264.601(a) and (b). Upon receipt of written approval from the ADEQ for the work plan, the Permittee shall implement the plan according to the schedule contained in the approved work plan.

In the event of disapproval (in whole or in part) of this work plan, the ADEQ will specify deficiencies in writing. The Permittee shall modify the plan to correct these deficiencies within thirty (30) calendar days of the receipt of notification of disapproval from the ADEQ and shall submit a modified work plan to the ADEQ for review. Upon receipt of written approval from the ADEQ for the work plan, the Permittee shall implement the plan according to the schedule contained in the approved work plan.

A Final Second EAR shall be submitted to ADEQ according to a schedule proposed in the approved work plan. If the ADEQ approves the report, the Permittee will be notified of this determination in writing. The Permittee shall obtain written notification from ADEQ that the information presented in this report demonstrates compliance with the Environmental Performance Standards codified at APC&EC Regulation No. 23 §264.601(a) and (b) prior to continue thermal treatment operations.

If ADEQ determines that the demonstrations of the Second EAR do not comply with these regulatory requirements and that the permitted activity endangers human health and the environment and can only be regulated to acceptable levels by termination of this permit, ADEQ will disapprove the final report in writing. ADEQ will follow the applicable procedures contained in 40 CFR 124 in terminating this Permit pursuant to APC&EC Regulation No. 23 §270.43(a)(3).

The environmental assessment process shall involve evaluations of the basic types of characterization data specified in Permit Module XIV, Condition I.1., relative to each of the media referenced in Permit Module XIV, Condition I., Environmental Assessments, the performance of screening and detailed assessments described in Permit Module XIV, Conditions I.2. and I.3., and if necessary shall include the performance of human health and environmental risk assessments described in Permit Module XIV, Conditions I.4 through I.6. If data necessary to comply with this permit condition is not available, the Permittee shall perform the activities required to obtain this data.

1. Characterization Data

   a. Unit Characterization

      The Permittee shall consider the design and operating parameters of each unit and shall discuss how direct contact with untreated wastes or treated residues and dry deposition of particulates from air emissions could serve as a pathway to ground water and the subsurface environment, surface water (including wetlands), and soils.

   b. Waste Characterization

      The Permittee shall consider the volume and physical/chemical characteristics (i.e., volatility, mobility in soils/ground water, ignitability, and toxicity) of the waste to be treated in each unit. [APC&EC Regulation No. 23 §264.601(a)(l), §264.601(b)(1), and §264.601(c)(l)]

   c. Site Characterization

      The Permittee shall consider the meteorological, climatological, geological, and hydrogeological characteristics of the site.

      The site characterization requirements concerning ground water assessments [APC&EC Regulation No. 23 §264.601(a)(2), (4), and (5)] shall take into consideration the hydrologic/geologic characteristics of the site. The Permittee shall describe soil types, depth to ground water, direction of ground water flow, net recharge, and characteristics of the aquifer system (i.e., permeability) including current and potential uses.

The site characteristic requirements concerning surface waters [APC&EC Regulation No. 23 §264.601(b)(3)] shall take into consideration hydrologic and topographic characteristics such as distance to surface waters, stream flow data relative to potential discharges, patterns of precipitation, and the general likelihood of releases to surface waters. Surface water uses in the area shall be identified.

The site characterization requirements concerning soils [APC&EC Regulation No. 23 §264.601(b)(3)] shall take into consideration soil characteristics (i.e., permeability) and land uses in the area.

An analysis of pre-existing site conditions [APC&EC Regulation No. 23 §264.601(a)(3), §264.601(b)(8), and §264.601(c)(5)] shall consider the possibility of contamination from past operations of previous units on or near the site, active sources offsite, and natural background levels (e.g., natural levels of metals in soils).

The Permittee shall consider human and environmental population distributions in complying with the requirements of this permit condition. In addition, the Permittee shall provide existing air quality, ground water, surface water, and hydrogeologic data obtained from federal, state, or local sources.

2. Screening Assessments

The Permittee shall perform screening assessments for each of the media referenced in Permit Module XIV, Condition I., Environmental Assessments. These screening assessments shall incorporate, but not be limited to, the information specified in Permit Module XIV, Condition I.1.a. through I.1.c. These screening assessments shall describe worst-case analyses for each of the following media and shall use a conservative approach for evaluating releases by incorporating worst-case assumptions into a model:

a. A ground water screening assessment shall cover the possibility of contaminants leaching through the thermal treatment area concrete pad and through the soil into the underlying ground water. This assessment shall determine worst-case ground water release scenarios (including characterization of the possible sources and the environmental setting of the release), determine worst-case dispersion scenarios for the transport of contaminants in the ground water, and allow for a qualitative analysis of local ground water quality.

b. A surface water screening assessment shall cover the possibility of hazardous wastes/hazardous waste constituents or residues impacting surface waters located at or adjacent to the facility. In conducting the assessment, the Permittee shall consider the possible adverse effects on wildlife, aquatic life, and human health.

c. A soil screening assessment shall cover the possibility of hazardous wastes/hazardous constituents or residues impacting area soils. This assessment shall require multiple levels of pathway analyses and shall

consider, but not be limited to, the following applicable scenarios:

i. Fugitive dust emissions from vehicular traffic;

ii. wind-blown fugitive dust emissions;

iii. surface runoff of particulates; and

iv. percolation of particulates to ground water.

d. An air screening assessment shall cover the possibility of hazardous wastes/hazardous waste constituents or residues impacting air located at or adjacent to the facility. In conducting the assessment, the Permittee shall consider the possible adverse effects on wildlife, aquatic life, and human health.

If the operation of the thermal treatment units can be shown to be protective of human health and the environment even when worst-case assumptions are used detailed assessments, described in Permit Module XIV, Condition I.3, may not be required. These determinations will be at the discretion of ADEQ.

3. Detailed Assessments

The objective of detailed assessments, if required, shall be to determine contaminant concentrations, in each of the media of Permit Module XIV, Conditions I.1.a. through I.1.c., using methods more detailed than those used during the screening assessment. These methods shall incorporate monitoring and modeling to determine emission/release rates and concentrations. The Permittee shall perform the required activities to obtain data not already available. Actual site-specific monitoring data shall be used when performing modeling activities.

A detailed assessment for ground water shall include the use of adequate models that account for transmissive and dispersive soil and ground water properties. A detailed assessment for surface waters shall utilize the most current methodologies for performing detailed modeling of water quality impacts.

4. Health and Environmental Assessments

Baseline human health and environmental risk assessments shall be performed as necessary to evaluate the potential threat to human health and the environment as a result of the conditions at the site. The baseline risk assessment shall identify and characterize the following:

a. toxicity and levels of hazardous substances in each media determined to be impacting human health and the environment;

b. such environmental fate and transport mechanisms as physical, chemical, and biological degradation processes and hydrogeologic conditions;

c. potential human and environmental receptors;

d. the extent of the expected impact or threat and the likelihood of such impact or threat occurring; and

e. uncertainty levels associated with the assessment.

5. Human Health Risk Assessment

The baseline human health risk assessment shall be divided into the following four components:

a. Data collection and evaluation shall involve screening the information that is available on the hazardous substances or wastes present at the site and identifying contaminants of concern for which subsequent efforts will be focused in the risk assessment process;

b. Exposure assessments shall include an estimate of the magnitude of actual and potential human exposures, in addition to the frequency and duration of the exposures, and the pathways by which humans potentially are exposed. The exposure assessment shall incorporate an analysis of contaminant releases, identification of exposed pathways and all potential pathways of exposure, estimates of exposure point concentrations for specific pathways (based on environmental monitoring data as well as predictive chemical modeling results), and estimates of contaminant intakes for specific pathways;

c. Toxicity assessments shall consider the types of adverse health or environmental effects associated with individual and multiple exposures, the relationship between the magnitude of the exposures and adverse effects, and such related uncertainties as the weight-of-evidence for the potential carcinogenicity of a chemical to humans. The toxicity assessment shall incorporate hazard identification and a dose-response evaluation. Reference doses, used to evaluate non-carcinogenic effects of exposure to contaminants, and cancer slope factors and the accompanying weight-of-evidence determination, used to evaluate potential human carcinogenic risks, shall be used to estimate the incidence of adverse effects occurring in humans at the different exposure levels; and

d. Risk characterization shall characterize and summarize the potential risks of adverse health effects for each of the exposure scenarios derived in the exposure assessment. Estimates of risk shall involve the integration of information developed during the exposure and toxicity assessments to characterize the potential or actual risks, including carcinogenic and non-carcinogenic risks. The final analysis shall include a summary of the risks associated with the site, including each projected exposure route for contaminants of concern and the distribution of risk across various sectors of the population. Such factors as the weight-of-evidence associated with toxicity information and any uncertainties associated with toxicity information and any uncertainties associated with exposure assessment also shall be discussed.

6. Environmental Risk Assessment

Characterization of the environmental risks shall involve the identification of potential exposure to the surrounding ecological receptors and evaluation of the potential effects associated with the exposures. The Permittee shall consider

disruptive effects to plant and animal populations and the extent of perturbations to the ecological community. The environmental assessment shall consist of the following components:

a. The definition of the scope of the investigation shall describe the kind and type of information that was collected in the study in terms of the physical, biological, and chemical parameters measured, estimated, or calculated in the assessment; over what time periods and what season(s) were the data collected; at what time intervals were the samples collected; and if the data were used to assess current effects of past damage or used to predict future scenarios;

b. The description of the site and study area shall provide a physical description of the site at a level of detail that is appropriate to the scope of the assessment. The physical boundaries for the assessment and the size of physical features such as stream reaches, roads, wetlands, or forested areas shall be described. An overall map of the area, with a minimum resolution equivalent to a 7.5' USGS quadrangle map, shall include all potentially affected areas linked to the contaminated zone by pathways of concern through any media, sampling location, and any references selected for the investigation. In addition, maps including the same information shown on the 7.5' USGS maps but of 1" = 200' scale and 2-foot contour intervals shall be prepared;

A narrative description of each habitat, accompanied by lists or tables of species collected or observed, shall be included to provide a full accounting of the ecosystems and populations potentially exposed to contamination in the vicinity of the site. The study shall consider resident, breeding, or rare species, including species of natural resource trustee concern; narrative characterization of the likely or presumed exposure pathways; and any readily observed effects potentially attributable to the site;

c. A description of the contaminants of concern from an ecological perspective shall be included;

d. The characterization of risk or threat shall address the following:

i. probability that an adverse effect will occur;

ii. the magnitude of such an effect;

iii. the temporal character of each transient, reversible, or permanent effect; and,

iv. the affected receptor populations or habitats.

e. The Permittee shall include a summary of the risk-related data with regard to the site including environmental contaminant concentrations in biota, toxicity test results, literature values of toxicity, field surveys of receptor populations, and measures of community structure and ecosystem function;

f. A narrative describing the nature and probability of adverse effects shall consider the following:

i. lasting effects upon removal of contaminants, length of recovery time for the receptor populations from the effects of the contaminants, intergenerational effects;

ii. movement of contaminants beyond the current study area via biotic transport and the effects of remediation on this movement;

iii. community and ecosystem effects of contamination and if removal of the contaminants is sufficient to restore community structure and ecosystem function;

iv. data on the exposure and observed or predicted effects relative to the rapidity of required response, which responses are required immediately, and which can be undertaken later; and

v. the limits that proposed remediation or mitigation actions place on future options for further remediation, follow-up assessment, and resource use.

g. A description of the derivation of remediation criteria or other uses of quantitative risk information shall be included. If other data are available for comparison to observed concentrations of contaminants, the risk assessment shall make the exceedances apparent by presenting the data along with the applicable criteria. Full reference citations for the source of reference doses, standards, or risk assessments used in calculating the criteria shall be provided. In addition, an explanation of and reference for the calculation method used to develop the criteria, as well as equations and parameters used in the calculations shall be provided; and

h. The conclusions and limitations component of the environmental risk assessment shall address the degree of success in meeting the assessment objectives. Each conclusion shall be presented along with the items of evidence that support and fail to support the conclusion, and the uncertainty accompanying the conclusion. Any factors that limited or prevented development of definitive conclusions also shall be described. Information that indicates the degree of confidence in the data used to assess the site and its contaminants shall also be provided.

J. AMBIENT AIR MONITORING PROGRAM

1. Reporting Requirements

a. Within sixty (60) calendar days of the effective date of this Permit, the Permittee shall submit to ADEQ for approval a Second Ambient Air Monitoring Work Plan which describes the activities necessary to implement an Ambient Air Monitoring Program at the facility. This monitoring program shall continue until ADEQ determines, through direct sampling of the air media, that the permitted activity will not affect human health and the environment. This work plan shall follow the requirements

specified in Permit Module XII(b), Condition Q., Tasks I, II, and V, except the work plan shall be modified to accomplish air monitoring and reporting rather than investigation.

b. This work plan shall be sufficient in quantity and quality to detect concentrations of hazardous wastes or hazardous waste constituents in the air that could have an adverse effect on human health and the environment. This work plan shall include a proposal to submit regularly scheduled reports describing the data generated during the monitoring program. After the Permittee submits the work plan, the ADEQ will either approve, disapprove, or modify the work plan in writing. If the ADEQ approves the work plan, the Permittee shall implement the plan according to the schedule contained in the plan.

c. In the event of disapproval (in whole or in part) of the work plan, the ADEQ will specify deficiencies in writing. The Permittee shall modify the plan to correct these deficiencies within thirty (30) calendar days of the receipt of notification of disapproval from the ADEQ and shall submit a modified work plan to the ADEQ for review. Upon receipt of written approval from the ADEQ for the work plan, the Permittee shall implement the plan according to the schedule contained in the approved work plan.

d. The submittal of the work plan specified in Permit XIV, Condition J.1.a., and implementation of the Ambient Air Monitoring Program shall consider EPA's guidance provided in "Interim Final, RCRA Facility Investigation (RFI) Guidance" (Volume I-IV, EPA 530/SW-89-031, May 1989), and specified in Permit Module XII(b), Condition Q., Tasks I, II, and V.

e. A Second Ambient Air Monitoring Report (AAMR) shall be submitted to ADEQ according to a schedule proposed in the work plan. This report shall describe the actions taken by the Permittee, in accordance with the approved work plan, to implement the air monitoring program. ADEQ may perform an inspection of the facility to ensure compliance with this Permit. The Permittee shall obtain written notification from ADEQ that the information presented in the Second AAMR demonstrates compliance with the Environmental Standards codified at APC&EC Regulation No. 23 §264.601(c), §264.602, and this Permit to continue operation of existing units.

f. Upon implementation of the Air Monitoring Program, the Permittee shall notify ADEQ in writing within fifteen (15) calendar days of the detection of hazardous wastes or hazardous waste constituents above background levels at any of the monitoring stations. Within thirty (30) calendar days of detection, the Permittee shall submit to ADEQ for approval a Facility Modification Work Plan which details the activities necessary to comply with the Environmental Performance Standards codified at APC&EC Regulation No. 23 §264.601(c).

g. In the event of disapproval (in whole or in part) of the work plan, ADEQ will specify deficiencies in writing. The Permittee shall modify the plan to correct these deficiencies within thirty (30) calendar days of the receipt of notification of disapproval from ADEQ and shall submit a modified work plan to ADEQ for review. Upon receipt of written approval from ADEQ for the work plan, the Permittee shall implement the plan according to the schedule contained in the approved work plan

h. A final Second AAMR shall be submitted to ADEQ according to a schedule proposed in the approved work plan. This report shall describe the corrective actions taken by the Permittee to comply with the Environmental Performance Standards codified at APC&EC Regulation No. 23 §264.601(c). The Permittee shall continue to monitor the ambient air at the facility according to the approved air monitoring plan and shall take corrective actions as necessary to ensure compliance with these environmental performance standards.

i. If ADEQ determines, through reviews of the regularly scheduled reports or the reports required by Permit Module XIV, Condition J.1.e., that the permitted activity does not comply with the Environmental Performance Standards codified at APC&EC Regulation No. 23 §264.601(c), endangers human health and the environment, and can only be regulated to acceptable levels by termination of this Permit, ADEQ will follow the applicable procedures contained in APC&EC Regulation Nos. 8 and 23 in terminating this Permit pursuant to APC&EC Regulation No. 23 §270.43(a)(3).

2. The Permittee shall maintain, calibrate, and operate monitoring equipment and record data while thermally treating hazardous waste as specified below:

a. Wind speed and direction are to be continuously monitored and recorded during treatment operations. This data has be kept in the operating record until approved closure of the facility; and

b. The permittee shall record in the operating record for this Permit the date and time of all failures of monitoring equipment and the length of non-operational status.

3. If the Permittee has completed the requirements of Permit Module XIV, Condition J.1., previously for a permit which has been renewed, the Permittee shall continue to operate according to the approved plan until the requirements of Permit Module XIV, Condition J.1. for the renewal permit have been completed.

K. SOIL AND SURFACE WATER SAMPLING WITH CONTINGENCY FOR GROUND WATER INVESTIGATION

1. Reporting Requirements

a. Within sixty (60) calendar days of the effective date of this Permit, the Permittee shall submit a work plan to ADEQ, for approval, detailing plans to implement a Soil and Surface Water Sampling Program at the facility for the duration of thermal treatment activities authorized by Permit

Module XIV. The soil and surface water sampling program shall be sufficient in quantity and quality to detect concentrations of hazardous wastes or hazardous waste constituents in the surface water or soil that could have adverse effects on human health and the environment and could potentially affect the underlying ground water. This work plan shall follow the requirements specified in Permit Module XII(b), Condition Q., Scope of Work for a RFI, Tasks I, II, and V, except shall be modified to accomplish Soil and Surface Water reporting rather than investigation. This work plan shall include a proposal to submit regularly scheduled reports describing the data generated during the monitoring program. After the Permittee submits the work plan, ADEQ will either approve, disapprove, or modify the work plan in writing. If ADEQ approves the work plan, the Permittee shall implement the plan according to the schedule contained in the plan.

b. In the event of disapproval (in whole or in part) of the work plan, ADEQ shall specify deficiencies in writing. The Permittee shall modify the plan to correct these deficiencies within thirty (30) calendar days of the receipt of notification of disapproval from ADEQ and shall submit a modified work plan to ADEQ for review. Upon receipt of written approval from ADEQ for the work plan, the Permittee shall implement the plan according to the schedule contained in the approved work plan. In the event that ADEQ disapproves the modified work plan, ADEQ will modify this work plan as necessary to accomplish the desired work. This modified work plan shall become the approved work plan.

c. The submittal of this work plan, the work plan specified in Permit Module XIV, Condition K.1.d., and implementation of the Soil and Surface Water Monitoring and Water Program shall consider EPA's guidance provided in "Interim Final, RCRA Facility Investigation (RFI) Guidance" (Volume I-IV, EPA 530/SW-89-031, May 1989), and specified in Permit Module XII(b), Condition Q., Tasks I, II, and V.

d. The Permittee shall notify ADEQ in writing, within fifteen (15) calendar days of the detection of hazardous wastes or hazardous waste constituents above background levels in the soil, or for any detectable levels in surface water within thirty (30) calendar days of the detection of contaminants in the soil or surface water, the Permittee shall submit to ADEQ for approval a Phase II Facility Investigation Work Plan which details the activities necessary to define the full vertical and horizontal extent of soil and surface water contamination and the activities necessary to comply with the Environmental Performance Standards codified at APC&EC Regulation No. 23 §264.601(a) and (b). The expanded work plan and all investigation and remediation work that may result under that work plan must follow the RFI/CMS/CMI process of Module XII(b), Conditions Q., R., and S., and for the items presented in Table IV. These activities may include, but not be limited to, plans to modify the construction details of the thermal treatment units, reduction of the maximum permitted treatment

capacity of the units, restriction of certain wastes determined to be adversely affecting human health and the environment from thermal treatment, assessment of human health and environmental risks posed by the contaminants, a groundwater investigation plan, excavation and disposal of the contaminated surface water and soils, or implementation of measures necessary to comply with the Environmental Performance Standards codified at APC&EC Regulation No. 23 §264.601(a) and (b).

e. In the event of disapproval (in whole or in part) of this expanded work plan (hereafter referred to as work plan), ADEQ will specify deficiencies in writing. The Permittee shall modify the plan to correct these deficiencies within thirty (30) calendar days of the receipt of notification of disapproval from ADEQ and shall submit a modified work plan to ADEQ for review. Upon receipt of written approval from ADEQ for the work plan, the Permittee shall implement the plan according to the schedule contained in the approved plan.

f. A Facility Investigation Report shall be submitted to ADEQ according to a schedule proposed in the approved work plan. This report shall describe the corrective actions taken by the Permittee to comply with the Environmental Performance Standards codified at APC&EC Regulation No. 23 §264.601(a) and (b). The Permittee shall continue to monitor the soil and surface water media according to the approved Soil and Surface Water Monitoring Program and shall take corrective actions as necessary to ensure compliance with these environmental performance standards.

g. If ADEQ determines, through reviews of the regularly scheduled reports or the reports required by Permit Module XIV, Condition K, that the permitted activity does not comply with the Environmental Performance Standards codified at APC&EC Regulation No. 23 §264.601(a) and (b), endangers human health and the environment, and can only be regulated to acceptable levels by termination of this Permit, ADEQ will follow the applicable procedures contained in APC&EC Regulation Nos. 8 and 23 in terminating this Permit pursuant to APC&EC Regulation No. 23 §270.43(a)(3).

TABLE IV- SUMMARY OF MODULE XIV REPORTING REQUIREMENTS	
Submission	Due Time (Calendar Days)
Second Environmental Assessment Work Plan	60 days from effective date of Permit
Environmental Assessment Work Plan (Amended)	30 days from receipt of NOD
Second Environmental Assessment Report	As determined by ADEQ
Facility Modification Work Plan	30 days from determination of noncompliance from ADEQ

TABLE IV- SUMMARY OF MODULE XIV REPORTING REQUIREMENTS	
Facility Modification Work Plan (Amended)	30 days from receipt of NOD
Final Second Environmental Assessment Report	As determined by ADEQ
Second Ambient Air Monitoring Work Plan	60 days from effective date of Permit
Ambient Air Monitoring Work Plan (Amended)	30 days from receipt of NOD
Ambient Air Sampling Reports	As determined by ADEQ
Second Ambient Air Monitoring Report	As determined by ADEQ
Notification of Detection of Hazardous Wastes/Constituents	15 days from date of detection
Phase II Facility Investigation Work Plan	30 days from date of detection
Phase II Facility Investigation Work Plan (Amended)	30 days from receipt of NOD
Phase II Facility Investigation	Report As determined by ADEQ
Soil and Surface Water Monitoring Work Plan	60 days from effective date of Permit
Soil and Surface Water Monitoring Work Plan(Amended)	30 days from receipt of NOD
Soil and Surface Water Sampling Reports	As determined by ADEQ
Expanded Work Plan for Ground Water Investigation and Protection	60 days from report showing potential surface water & ground water impacts
Ground Water Investigation Report (Reserved)*	To be determined by ADEQ
Surface Water and Ground Water Corrective Measures Study*	To be determined by ADEQ
Surface Water and Ground Water Corrective Measures Implementation (Reserved)*	To be determined by ADEQ

TABLE IV- SUMMARY OF MODULE XIV REPORTING REQUIREMENTS	
Surface Water and Ground Water Corrective Measures Implementation (Reserved)*	To be determined by ADEQ

* It is the intent of the conditions of this Permit that the surface water and soil sampling would detect contamination early so that these tasks would not be needed except to the extent necessary to protect groundwater.

L. CLOSURE AND POST-CLOSURE

At final closure of the open burning unit(s), the Permittee shall follow the procedures in the Closure Plan, Section I of the Part B Application.

1. If after closure the Permittee finds that not all contaminated soils and debris can be removed or decontaminated in accordance with the Closure Plan, then the Permittee shall close the open burning unit(s) and perform post-closure care in accordance with requirements contained in Permit Module XIII which will be added if Post-Closure Care is deemed necessary.

2. The Permittee shall perform post-closure care in accordance with the Post-Closure Plan, Section I of the Part B Application.

M. RECORDKEEPING

The Permittee shall develop and maintain all records required to comply with APC&EC Regulation No. 23 §264.73, §264.602, and Section F and H of the Part B Application.

END OF MODULE XIV