ADEQ
MINOR SOURCE
AIR PERMIT

Permit No. : 0196-AR-5

IS ISSUED TO:

Halliburton Energy Services, Inc. - Magnet Cove Chemical Facility
1743 Darby Lane
Magnet Cove, AR 72104
Hot Spring County
AFIN: 30-00009

THIS PERMIT IS THE ABOVE REFERENCED PERMITTEE'S AUTHORITY TO CONSTRUCT, MODIFY, OPERATE, AND/OR MAINTAIN THE EQUIPMENT AND/OR FACILITY IN THE MANNER AS SET FORTH IN THE DEPARTMENT'S MINOR SOURCE AIR PERMIT AND THE APPLICATION. THIS PERMIT IS ISSUED PURSUANT TO THE PROVISIONS OF THE ARKANSAS WATER AND AIR POLLUTION CONTROL ACT (ARK. CODE ANN. SEC. 8-4-101 *ET SEQ.*) AND THE REGULATIONS PROMULGATED THEREUNDER, AND IS SUBJECT TO ALL LIMITS AND CONDITIONS CONTAINED HEREIN.

Signed:

Mike Bates
Chief, Air Division

Date Amended

Halliburton Energy Services, Inc. – Magnet Cove Chemical Facility
Permit #: 0196-AR-5
AFIN: 30-00009
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List of Acronyms and Abbreviations

A.C.A.	Arkansas Code Annotated
AFIN	ADEQ Facility Identification Number
CFR	Code of Federal Regulations
CO	Carbon Monoxide
HAP	Hazardous Air Pollutant
lb/hr	Pound Per Hour
No.	Number
NO_x	Nitrogen Oxide
PM	Particulate Matter
PM10	Particulate Matter Smaller Than Ten Microns
SO2	Sulfur Dioxide
Tpy	Tons Per Year
UTM	Universal Transverse Mercator
VOC	Volatile Organic Compound

Section I: FACILITY INFORMATION

PERMITTEE:	Halliburton Energy Services, Inc. - Magnet Cove Chemical Facility
AFIN:	30-00009
PERMIT NUMBER:	0196-AR-5
FACILITY ADDRESS:	1743 Darby Lane Magnet Cove, AR 72104
MAILING ADDRESS:	PO Box 10 Malvern, Arkansas 72104
COUNTY:	Hot Spring
CONTACT POSITION:	Paul Mills, Plant Manager
TELEPHONE NUMBER:	(501) 337-9014
REVIEWING ENGINEER:	Bryan Leamons
UTM North South (Y):	3810.0
UTM East West (X):	507.8
Zone:	15

Section II: INTRODUCTION

Summary of Permit Activity

This permit modification allows an alternative compliance mechanism from previous permits. New permit conditions limit total product at each circuit as opposed to the previous material-specific limits. Recalculation based on the worst cases while operating within the maximum productions cause permitted VOC emissions to increase by 24.0 tons per year. Additionally a new amine storage tank is permitted as SN-15. VOC remains the predominant pollutant at the facility at 76.7 tons per year.

Process Description

The Magnet Cove facility prepares several products used in the oil and gas industry. Production is divided between two independent circuits. These are referred to as the Duratone and the Extruder Circuits.

THE DURATONE CIRCUIT

The Duratone Circuit is both a continuous and batch process which manufactures Duratone (an organophilic lignite). A Lignite raw material is mixed and heated with a solution of water and caustic soda in a pre-mix tank. The mixture is then pumped to one of the three reactor tanks where the following liquid raw materials are added. Three storage tanks hold the amine (SN-01), amide chloride (SN-02), and Nonylphenol (insignificant category A-3). These organics and the lignite raw material react forming an organophilic lignite. Each of the reactor tanks are vented to the thermal oxidizer (SN-04) to destroy the organic compounds volatilized in the reactor tanks. The reacted lignite slurry is then fed by gravity to a table filter where the liquid is separated from the Duratone slurry. Another vent from the table filter sends any volatiles generated to the thermal oxidizer. The table filter functions due to the action of a vacuum pump pulling the liquid through the filter. The Duratone slurry is conveyed by a transfer screw (where a clay is added, SN-11) to a 4.5 MMBtu/hr rotary dryer. The dried Duratone is then conveyed by a transfer screw to a mill. The vapor and particulate emissions from the rotary dryer are sent to the dust collector where the particulate is controlled and any organic compounds pass through the dust collector and to the thermal oxidizer. The Duratone is collected down stream from the mill by a cyclone and sent via a screw to the Packer Bin. The particulate that is not collected by the cyclone is sent to the dust collector for control. The collected dust is sent back to the packer bin screw for packing into 50-pound sacks or bulk supersacks.

THE EXTRUDER CIRCUIT

The extruder circuit manufactures various organophilic clay products. Clay is fed into an extruder where it is mixed with an amine with water periodically added. Amine is stored in the Amine Storage Tanks (SN-1 & SN-15). The amine reacts with the clay to form an organophilic clay. The organophilic clay is then conveyed by transfer screw (SN-10) to a mill which is also fed hot air by a 2.4 MMBtu/hr flash dryer. Other specialty chemicals may also be used in the

process upon the customers' request. The resulting product is then classified, collected and sent to the packer bin (SN-13). The particulate is collected by a dust collector. The organic compounds volatilized by the flash dryer pass through the dust collector to a thermal oxidizer (SN-05) where they are destroyed. The collected dust is sent back to the packer bin screw for packing into 50-pound sacks or bulk supersacks.

WASTEWATER

Wastewater from facility sumps is collected and sent either to the wastewater storage tanks (Insignificant category A-13) or to the wastewater ponds (SN-14) before being sent to a local publicly-owned treatment works (POTW). Plant IPA concentrations (collected from monthly samples from July 1997 to September 1999) listed on the IPA Testing Results Table in Attachment 4 were applied to the Tanks 4.0 Program to calculate air emissions from the three wastewater tanks.

INSIGNIFICANT SOURCES

Two material transfer points at the Duratone and Extruder circuits and a product packaging source at the Duratone circuit is considered insignificant. These sources have low aggregate emissions and are not subject to the NSPS Subpart OOO and therefore qualify as A-13 insignificant activities. See Section V for a complete list of insignificant activities.

Regulations

The following table contains the regulations applicable to this permit.

Regulations
Arkansas Air Pollution Control Code, Regulation 18, effective February 15, 1999
Regulations of the Arkansas Plan of Implementation for Air Pollution Control, Regulation 19, effective February 15, 1999
40 CFR Part 60, Subpart OOO – Standards of Performance for Nonmetallic Mineral Processing Plants

Total Allowable Emissions

The following table is a summary of emissions from the facility. This table, in itself, is not an enforceable condition of the permit.

TOTAL ALLOWABLE EMISSIONS		
Pollutant	Emission Rates	
	lb/hr	tpy
PM	4.3	17.7
PM_{10}	4.3	17.7
SO_2	0.2	0.2
VOC	234.3	76.7
CO	1.5	6.2
NO_x	2.9	12.3
Total HAP	2.57	9.12
Methyl Chloride	0.93	3.50
Benzyl Chloride	1.64	5.62

Section III: PERMIT HISTORY

Permit 196-A was issued on 11-30-73. This permit covered the operation of 3 barite ore dryers which were controlled with dust collectors. On 12-27-84 this permit was voided.

Permit 196-AR-1 was issued on 9-10-90. This permit covered several emission limit changes as well as the permitting of previously unpermitted operations. The facility had been operating without an air permit since 12-27-84, when 196-A was voided.

Permit 196-AR-2 was issued on 3-27-91 to incorporate a few emission changes.

Permit 196-AR-3 was issued on 7-3-97. This modification included an expansion of the plant to increase production, and the installation of two new RTOs and a baghouse type dust collector. Previously, there were two production circuits which could not be operated simultaneously. This modification allowed Baroid the capability of operating both production circuits simultaneously, allowing the potential production capacity to increase.

Permit 196-AR-4 was issued on 10-18-99. This modification increased production to 100% of plant capacity, an increase from 55% in the previous permit. There is a reduction of permitted volatile organic compounds emission rate from 99.9 tons per year to 49.8 tons per year based on a report performed by Radian International. It was learned through this testing that the anaerobic biodegradation of Isopropyl Alcohol in the wastewater pond was much greater than originally calculated in the previous permit application. This reduction in permitted emissions allowed Baroid to increase the plant production to 100% without triggering major source thresholds.

Section IV: EMISSION UNIT INFORMATION

Specific Conditions

1. The permittee shall not exceed the emission rates set forth in the following table. Compliance shall be demonstrated by compliance with Specific Conditions 6, 9, 10, and 11. [Regulation 19, §19.501 et seq., effective February 15, 1999 and A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]

SN	Description	Pollutant	lb/hr	tpy
01	Amine Storage Tank – Duratone Circuit (15,000 gal)	VOC	54.3	3.2
02	Amide Chloride Storage Tank – Duratone Circuit (10,000 gal)	VOC	57.2	1.6
03	Benzyl Amine Storage Tank – Duratone Circuit (15,000 gal)	VOC	51.1	2.5
04	Duratone Circuit Thermal Oxidizer	PM_{10} SO_2 VOC CO NO_x	2.0 0.1 5.5 0.8 1.4	8.6 0.1 23.8 3.4 6.1
05	Extruder Circuit Thermal Oxidizer	PM_{10} SO_2 VOC CO NO_x	2.0 0.1 8.0 0.7 1.5	8.6 0.1 27.3 2.8 6.2
10	Raw Material Transfer – Extruder Circuit	PM_{10}	0.1	0.2
11	Raw Material Transfer – Duratone Circuit	PM_{10}	0.1	0.1
13	Product Packaging – Extruder Circuit	PM_{10}	0.1	0.2
14	Wastewater Ponds	VOC	3.9	15.4
15	Amine Storage Tank – Extruder Circuit (12,000 gal)	VOC	54.3	2.9

2. The permittee shall not exceed the emission rates set forth in the following table. Compliance shall be demonstrated by compliance with Specific Conditions 6, 10, 11, 13, and 14. [Regulation 18, §18.801, effective February 15, 1999, and A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]

SN	Description	Pollutant	lb/hr	tpy
04	Duratone Circuit Thermal Oxidizer	PM	2.0	8.6
05	Extruder Circuit Thermal Oxidizer	PM	2.0	8.6
10	Raw Material Transfer – Extruder Circuit	PM	0.1	0.2
11	Raw Material Transfer – Duratone Circuit	PM	0.1	0.1
13	Product Packaging – Extruder Circuit	PM	0.1	0.2
all	Facility wide emission cap	Methyl chloride Benzyl chloride	0.93 1.64	3.50 5.62

3. Visible emissions shall not exceed the limits specified in the following table of this permit as measured by EPA Reference Method 9. [A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]

SN	Limit	Regulatory Citation
04	10%	§18.501
05	7%	NSPS Subpart OOO
10	10%	NSPS Subpart OOO
11	10%	NSPS Subpart OOO
13	10%	NSPS Subpart OOO
14	20%	§19.503

4. The permittee shall not cause or permit the emission of air contaminants, including odors or water vapor and including an air contaminant whose emission is not otherwise prohibited by Regulation 18, if the emission of the air contaminant constitutes air pollution within the meaning of A.C.A. §8-4-303. [Regulation 18, §18.901 and A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]

5. The permittee shall not conduct operations in such a manner as to unnecessarily cause air contaminants and other pollutants to become airborne. [Regulation 18, §18.801 and A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]

Plantwide Conditions

6. The permittee shall not exceed more than 13,900 tons production at the Duratone circuit and 15,800 tons production at the Extruder circuit per consecutive 12-month period. [§19.705 and A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]

7. The permittee shall maintain monthly records to demonstrate compliance with Specific Condition 6. A rolling twelve-month total shall be kept with each individual month's records. Records shall be updated by the fifteenth day of the month following the month to which the records pertain. The permittee shall keep the records onsite, and make the records available to Department personnel upon request. [§19.705 and A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]

NSPS Conditions

8. Opacity at SN-05, SN-10, SN-11, and SN-13 shall not exceed the limits set forth in Specific Condition 3 of this permit as measured by EPA Reference Method 9, and particulate emissions from SN-05 shall not exceed 0.05 grams per dry standard cubic meter as measured by EPA Reference Method 5. Opacity compliance is verified by Specific Condition 12. SN-05 mass emission limit has been verified by previous successful stack testing and Specific Condition 11. [§19.304 and 40 CFR 60.672]

RTO Operations

9. The permittee shall measure the VOC from SN-04 and SN-05 on an annual basis using EPA Reference Methods 25A. If the permittee chooses not to include methane in the total VOCs, then Method 18 shall be used simultaneously with Method 25A to determine the concentration of methane in the exhaust gas stream. Testing shall be performed with the equipment operating at least at 90% of its permitted capacity. [§19.702 and A.C.A. §8-4-203 as referenced by §8-4-304 and §8-4-311]

10. The permittee shall use only pipeline quality natural gas as fuel in SN-04 and SN-05. [19.705 and A.C.A. §8-4-203 as referenced by §8-4-304 and §8-4-311]

11. The permittee shall operate all dust collector/ filter pre-control devices to the RTOs according to manufacturer specifications. [§19.303 and A.C.A. §8-4-203 as referenced by §8-4-304 and §8-4-311]

Opacity

12. The permittee shall measure the opacity at SN-05, SN-10, SN-11, and SN-13, on an annual basis using EPA Reference Method 9 to verify compliance with limits set by

Specific Condition 3. Each test shall consist of at least three six-minute periods at each source. [§19.702 and A.C.A. §8-4-203 as referenced by §8-4-304 and §8-4-311]

Material Content Limits

13. The permittee shall not use Methyl Amine with a Methyl Chloride content greater than 0.03% by weight. [§18.1004 and A.C.A. §8-4-203 as referenced by §8-4-304 and §8-4-311]

14. The permittee shall not use Benzyl Amine with a Benzyl Chloride content greater than 0.08% by weight. [§18.1004 and A.C.A. §8-4-203 as referenced by §8-4-304 and §8-4-311]

15. The permittee shall maintain the MSDS on site for the Methyl Amine and Benzyl Amine solutions showing the percent content of Methyl Chloride and Benzyl Chloride. These records shall be made available for inspection upon request. [§18.1004 and A.C.A. §8-4-203 as referenced by §8-4-304 and §8-4-311]

Section V: INSIGNIFICANT ACTIVITIES

The Department deems the following types of activities or emissions as insignificant on the basis of size, emission rate, production rate, or activity in accordance with Group A of the Insignificant Activities list found in Regulation 18 and 19 Appendix A. Insignificant activity emission determinations rely upon the information submitted by the permittee in an application received August 5, 2004.

Description	Category
10,000 gallon Caustic Soda storage tank	A-4
10,000 gallon Nonylphenol storage tank	A-3
Natural Gas Fired Boiler (2.68 MMBtu/hr) (formerly SN-06)	A-1
Natural Gas Fired Water Heater (2.4 MMBtu/hr) (formerly SN-07)	A-1
Raw Material Transfer – Extruder Circuit (formerly SN-08)	A-13
Raw Material Transfer – Duratone Circuit (formerly SN-09)	A-13
Product Packaging – Duratone Circuit (formerly SN-12)	A-13
500 Gallon Specialty Chemical Storage Tank	A-13
Unpaved Roads	A-13
Wastewater Tanks	A-13
250 gallon Diesel tank	A-2
600 gallon Gasoline tank	A-13

Section VI: GENERAL CONDITIONS

1. Any terms or conditions included in this permit that specify and reference Arkansas Pollution Control & Ecology Commission Regulation 18 or the Arkansas Water and Air Pollution Control Act (A.C.A. §8-4-101 et seq.) as the sole origin of and authority for the terms or conditions are not required under the Clean Air Act or any of its applicable requirements, and are not federally enforceable under the Clean Air Act. Arkansas Pollution Control & Ecology Commission Regulation 18 was adopted pursuant to the Arkansas Water and Air Pollution Control Act (A.C.A. §8-4-101 et seq.). Any terms or conditions included in this permit that specify and reference Arkansas Pollution Control & Ecology Commission Regulation 18 or the Arkansas Water and Air Pollution Control Act (A.C.A. §8-4-101 et seq.) as the origin of and authority for the terms or conditions are enforceable under this Arkansas statute.

2. This permit does not relieve the owner or operator of the equipment and/or the facility from compliance with all applicable provisions of the Arkansas Water and Air Pollution Control Act and the regulations promulgated under the Act. [A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]

3. The permittee will notify the Department in writing within thirty (30) days after commencement of construction, completion of construction, first operation of equipment and/or facility, and first attainment of the equipment and/or facility target production rate. [Regulation 19, §19.704 and/or A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]

4. Construction or modification must commence within eighteen (18) months from the date of permit issuance. [Regulation 19, §19.410(B) and/or Regulation 18, §18.309(B) and A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]

5. The permittee must keep records for five years to enable the Department to determine compliance with the terms of this permit such as hours of operation, throughput, upset conditions, and continuous monitoring data. The Department may use the records, at the discretion of the Department, to determine compliance with the conditions of the permit. [Regulation 19, §19.705 and/or Regulation 18, §18.1004 and A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]

6. A responsible official must certify any reports required by any condition contained in this permit and submit any reports to the Department at the address below. [Regulation 19, §19.705 and/or Regulation 18, §18.1004 and A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]

Arkansas Department of Environmental Quality
Air Division
ATTN: Compliance Inspector Supervisor
Post Office Box 8913
Little Rock, AR 72219

7. The permittee will test any equipment scheduled for testing, unless stated in the Specific Conditions of this permit or by any federally regulated requirements, within the following time frames: (1) newly constructed or modified equipment within sixty (60) days of achieving the maximum production rate, but no later than 180 days after initial start up of the permitted source or (2) existing equipment already operating according to the time frames set forth by the Department. The permittee must notify the Department of the scheduled date of compliance testing at least fifteen (15) days in advance of such test. The permittee must submit compliance test results to the Department within thirty (30) days after the completion of testing. [Regulation 19, §19.702 and/or Regulation 18, §18.1002 and A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]

8. The permittee will provide: [Regulation 19 , §19.702 and/or Regulation 18 , §18.1002 and A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]

    a. Sampling ports adequate for applicable test methods
    b. Safe sampling platforms
    c. Safe access to sampling platforms
    d. Utilities for sampling and testing equipment

9. The permittee will operate equipment, control apparatus and emission monitoring equipment within their design limitations. The permittee will maintain in good condition at all times equipment, control apparatus and emission monitoring equipment. [Regulation 19, §19.303 and/or Regulation 18, §18.1104 and A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]

10. If the permittee exceeds an emission limit established by this permit, the permittee will be deemed in violation of said permit and will be subject to enforcement action. The Department may forego enforcement action for emissions exceeding any limits established by this permit provided the following requirements are met: [Regulation 19, §19.601 and/or Regulation 18, §18.1101 and A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]

    a. The permittee demonstrates to the satisfaction of the Department that the emissions resulted from an equipment malfunction or upset and are not the result of negligence or improper maintenance, and the permittee took all reasonable measures to immediately minimize or eliminate the excess emissions.
    b. The permittee reports the occurrence or upset or breakdown of equipment (by telephone, facsimile, or overnight delivery) to the Department by the end of the next business day after the occurrence or the discovery of the occurrence.

c. The permittee must submit to the Department, within five business days after the occurrence or the discovery of the occurrence, a full, written report of such occurrence, including a statement of all known causes and of the scheduling and nature of the actions to be taken to minimize or eliminate future occurrences, including, but not limited to, action to reduce the frequency of occurrence of such conditions, to minimize the amount by which said limits are exceeded, and to reduce the length of time for which said limits are exceeded. If the information is included in the initial report, the information need not be submitted again.

11. The permittee shall allow representatives of the Department upon the presentation of credentials: [A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]

a. To enter upon the permittee's premises, or other premises under the control of the permittee, where an air pollutant source is located or in which any records are required to be kept under the terms and conditions of this permit;
b. To have access to and copy any records required to be kept under the terms and conditions of this permit, or the Act;
c. To inspect any monitoring equipment or monitoring method required in this permit;
d. To sample any emission of pollutants; and
e. To perform an operation and maintenance inspection of the permitted source.

12. The Department issued this permit in reliance upon the statements and presentations made in the permit application. The Department has no responsibility for the adequacy or proper functioning of the equipment or control apparatus. [A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]

13. The Department may revoke or modify this permit when, in the judgment of the Department, such revocation or modification is necessary to comply with the applicable provisions of the Arkansas Water and Air Pollution Control Act and the regulations promulgated the Arkansas Water and Air Pollution Control Act. [Regulation 19, §19.410(A) and/or Regulation 18, §18.309(A) and A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]

14. This permit may be transferred. An applicant for a transfer must submit a written request for transfer of the permit on a form provided by the Department and submit the disclosure statement required by Arkansas Code Annotated '8 1 106 at least thirty (30) days in advance of the proposed transfer date. The permit will be automatically transferred to the new permittee unless the Department denies the request to transfer within thirty (30) days of the receipt of the disclosure statement. The Department may deny a transfer on the basis of the information revealed in the disclosure statement or other investigation or, deliberate falsification or omission of relevant information. [Regulation 19, §19.407(B) and/or Regulation 18, §18.307(B) and A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]

15. This permit shall be available for inspection on the premises where the control apparatus is located. [A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]

16. This permit authorizes only those pollutant emitting activities addressed herein. [A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]

17. This permit supersedes and voids all previously issued air permits for this facility. [Regulation 18 and 19 and A.C.A. §8-4-203 as referenced by A.C.A. §8-4-304 and §8-4-311]

18. The permittee must pay all permit fees in accordance with the procedures established in Regulation No. 9. [A.C.A §8-1-105(c)]