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# Clean Closure Report
# Thermal Treatment Unit
# Conoco Ponca City Refinery
# Ponca City, Oklahoma

Prepared for

**Conoco Inc.**
1000 South Pine
Ponca City, Oklahoma 74603

HLA Project No. 21451 8.1.1

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Principal

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November 20, 1995

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# INTRODUCTION

This report has been prepared on behalf of Conoco Inc. (Conoco) by Harding Lawson Associates (HLA) to document the clean closure of the Thermal Treatment Unit (TTU) at the Conoco Ponca City Refinery (Refinery). This report includes (1) a summary of activities associated with the clean closure of the TTU, and (2) certifications of closure by Conoco and an independent professional engineer registered in Oklahoma.

The Oklahoma Department of Environmental Quality (ODEQ) approved the Closure Plan, Thermal Treatment Unit, Conoco Ponca City Refinery (Closure Plan) on May 22, 1995, with the following revisions: (1) add a minimum of two additional surface soil sampling locations downgradient, with respect to surface runoff, of the approximate detonation location, and (2) closure is to be certified by an independent registered professional engineer and Conoco. HLA is presenting the information in this report to demonstrate that the requirements of the Closure Plan have been met.

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## SITE DESCRIPTION

The Refinery is located on a 1312-acre site in Kay County, Oklahoma, along the southern and western edges of Ponca City at 1000 South Pine Street. The Refinery is divided into four geographic areas: East Plant, West Plant, Southwest Plant, and South Plant. The Thermal Treatment Unit is located in an open area of the Refinery's Southwest Plant, immediately south of Equipment Storage Tank 647 (Figure 1). The lateral boundaries of the Thermal Treatment Unit, as shown in Figure 1, surround the area in which open detonation/open burning occurred.

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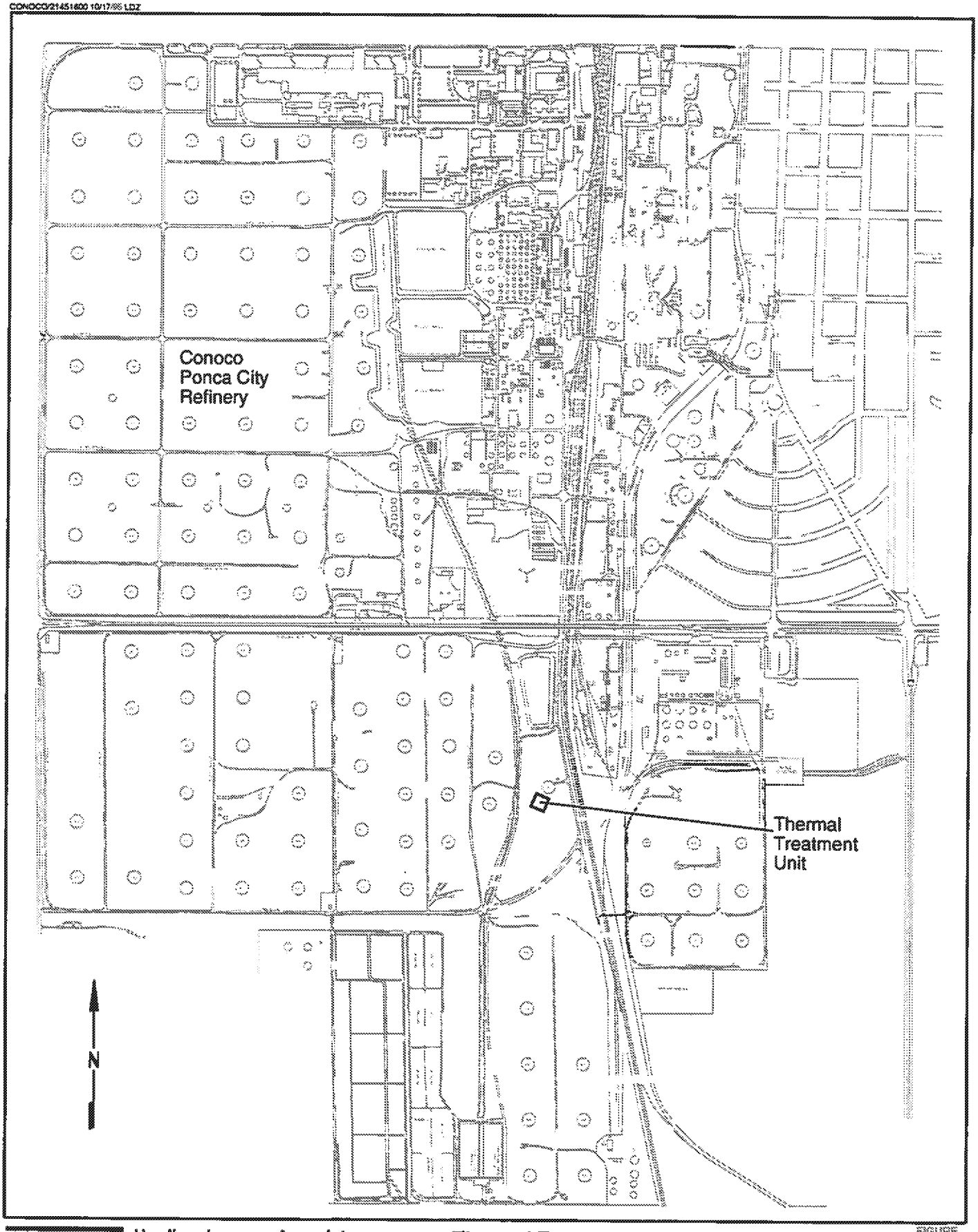
CONOCO/21451800 10/17/95 LDZ

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**Thermal Treatment Unit**
**Location Map**
Conoco Ponca City Refinery
Ponca City, Oklahoma

FIGURE
1

| DRAWN | JOB NUMBER | APPROVED | DATE | REVISED DATE |
|---|---|---|---|---|
| LDZ | 21451.8.1.1 | | 10/95 | |

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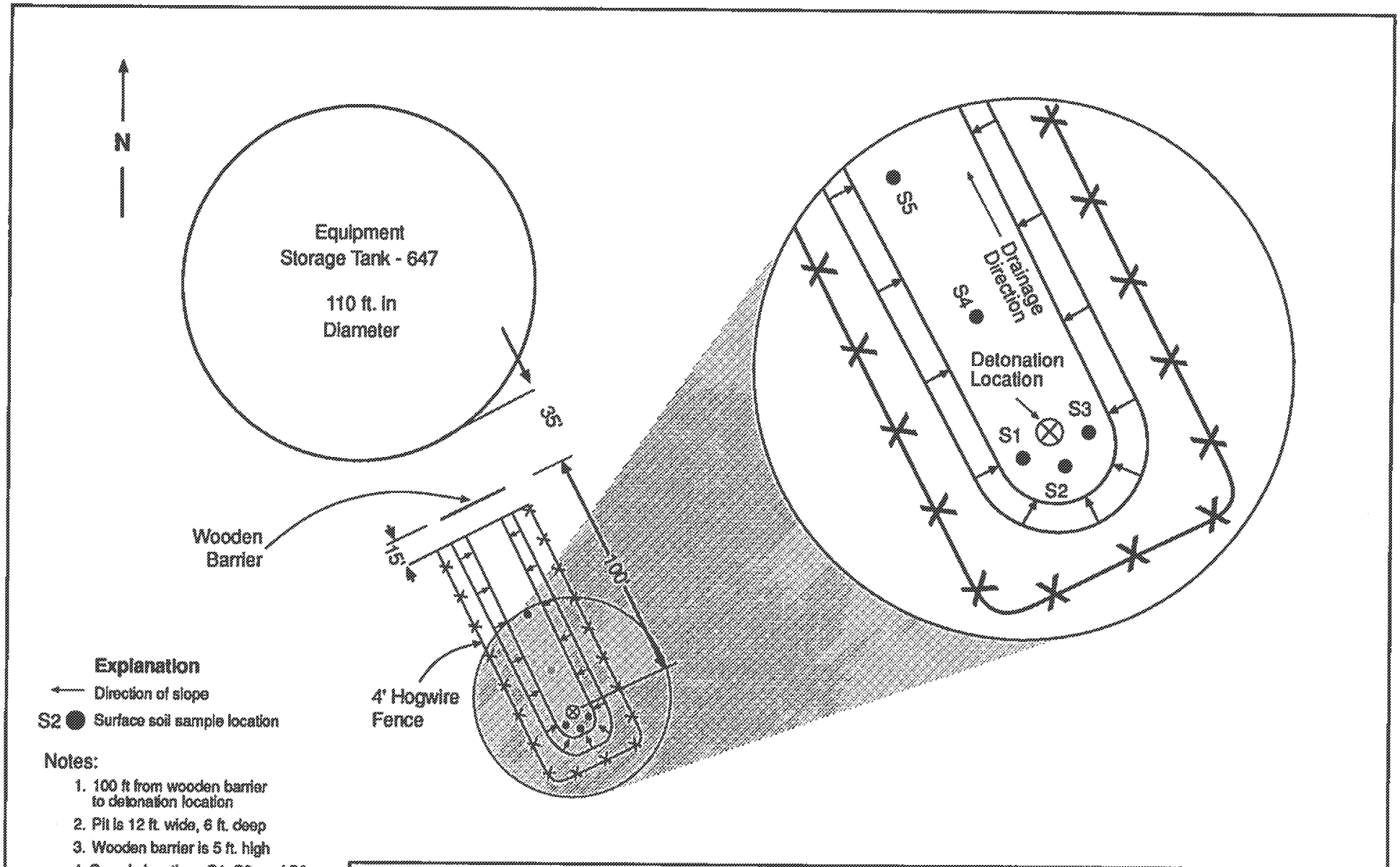
## UNIT DESCRIPTION

The Thermal Treatment Unit was a 6-foot-deep earthen trench approximately 100 feet long and 12 feet wide. A 5-foot-high wooden barrier constructed of 4 x 4s was located at the open northeast end of the trench. A 4-foot hogwire fence surrounded the outer embankments of the trench (Figure 2). The base of the trench is red clay typical of the Vanoss series.

Potentially explosive hazardous wastes were periodically detonated and/or open-burned in the Thermal Treatment Unit and generally included organic peroxides, peroxide formers, polymer accelerators, and other highly reactive materials. The amount of potentially explosive hazardous wastes detonated and open-burned at the unit on an annual basis was quite variable and likely did not exceed 300 pounds in any calendar year. No single detonation event exceeded 100 pounds. The total volume of waste treated at the unit through 1994 is estimated to have been 4,200 pounds, assuming that 300 pounds of wastes per year were treated over the approximately 14 years of unit operation. No hazardous waste or visible hazardous waste residue was left in the Thermal Treatment Unit after each event and no hazardous waste or hazardous waste residues were present at the time of closure.

Potentially explosive wastes were carefully hauled to the Thermal Treatment Unit by truck. Especially sensitive units were transported under ice to ensure these potentially explosive materials did not explode. Containers of potentially explosive waste were placed in the earthen trench 100 feet from the wooden barrier. Standing behind the wooden barrier, a person using a small caliber rifle punctured the containers. If detonation did not occur, an ignition source (a handheld flare) was applied to ensure complete burning of the waste material. Once the wastes were safely detonated and burned, the debris was cleaned up. No residue was left in the unit. Because of the explosive, flammable, and volatile nature of the waste materials, destruction was complete.




Notes:

1. 100 ft from wooden barrier to detonation location
2. Pit is 12 ft. wide, 6 ft. deep
3. Wooden barrier is 5 ft. high
4. Sample locations S1, S2, and S3 are 9 feet from detonation location
5. Sample locations S4 and S5 are 29.75 and 42.6 feet, respectively, from detonation location

Not To Scale

HLA

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**Thermal Treatment Unit Site Plan and Closure Verification Sample Locations**
Conoco Ponca City Refinery
Ponca City, Oklahoma

FIGURE
**2**

| DRAWN | JOB NUMBER | APPROVED | DATE | REVISED DATE |
|---|---|---|---|---|
| NLM | 21451,8.1.1 | | 10/95 | |

CON 1048.8b 11/17/95 SRH

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The Thermal Treatment Unit is currently a Resource Conservation and Recovery Act (RCRA)-regulated interim status unit under the authority of the Oklahoma Department of Environmental Quality (ODEQ). Closure operations at the Thermal Treatment Unit are primarily regulated under 40 Code of Federal Regulations (CFR) Part 265, Subpart G.

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## CLOSURE ACTIVITIES

### *Removal of Structures*

Conoco removed the 4-foot hogwire fencing that surrounded the TTU and the 5-foot wooden barrier on August 17, 1995. Debris from the fencing and the barrier was disposed as nonhazardous solid waste in accordance with the Closure Plan.

### *Removal, Treatment, and Disposal of Surface Soil*

Conoco staked an area with a 10-foot radius around the detonation zone and excavated topsoil to a depth of approximately 6 inches on August 17 and 18, 1995. A total volume of approximately 5.8 cubic yards of soil were excavated and placed in a covered roll-off container. The roll-off remained onsite until Conoco received validated analytical results from closure verification sampling. Sampling and analysis procedures are described below.

After demonstrating clean closure of the TTU, no further excavation at the TTU was required. The excavated soil stored onsite in the roll-off container was transported to a facility approved by ODEQ for disposal.

### *Verification Sampling and Analysis*

A visual inspection of the excavation was conducted by HLA personnel on August 21, 1995, prior to collecting closure verification samples. No visible staining of soil in and around the TTU was evident and the surface was generally free of debris that may have been associated with site activities.

Five surface-soil samples were collected on August 21, 1995, to verify clean closure of the TTU (Figure 2). Each surface- soil sample was collected from a depth of 0 to 6 inches. Three investigative samples (S1, S2, and S3) and one field duplicate quality control sample (S1 duplicate) were collected at locations 9.0 feet from the center of the detonation zone (Figure 2). Two investigative samples (S4 and S5) were collected downslope from the detonation zone at distances of 29.75 feet and

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42.6 feet from the center of the detonation zone (Figure 2) on August 27, 1995. All samples were packed on ice and shipped to Quanterra Environmental Services (Quanterra) for analysis.

In accordance with the Closure Plan, the samples were analyzed for three specific compounds known to have been detonated and/or burned at the TTU. These three compounds were selected because they represent a broad range in mobility and solubility, with tetrahydrofuran being the most soluble and the most mobile and styrene being the least soluble and least mobile. Analyses of soil samples were conducted using U.S. Environmental Protection Agency (EPA) Method 8240 for volatile organic compounds. The specific compounds evaluated and their respective method reporting limits (MRLs) were:

| Compound | Method Reporting Limit (mg/kg) |
|---|---|
| Ethyl ether | 0.050 |
| Styrene | 0.005 |
| Tetrahydrofuran | 0.010 |

mg/kg Milligrams per kilogram

These MRLs were derived by Quanterra statistical method detection limit studies in accordance with the requirements of 40 CFR 136 and "Test Methods for Evaluating Solid Waste" (EPA, 1987). The reported laboratory results were validated in accordance with the EPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (1994) and the Data Collection and Quality Assurance Plan (HLA, 1991) for the Refinery RCRA facility investigation. As indicated in the following summary of closure verification sampling results, there were no detections of target compounds above their respective MRLs. Validated laboratory Form I reports are attached.

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### *Closure Verification Sampling Results*

| Compound | Sample Identification | | | | | |
|---|---|---|---|---|---|---|
| | S1 | S1 (Dup) | S2 | S3 | S4 | S5 |
| Tetrahydrofuran | 0.010 U | 0.010 U | 0.010 U | 0.010 U | 0.010 U | 0.010 U |
| Ethyl ether | 0.050 UJ | 0.050 UJ | 0.050 UJ | 0.050 UJ | 0.050 U | 0.050 U |
| Styrene | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U |

Results are reported in milligrams per kilogram (mg/kg)

Dup Duplicate field sample
J The reported detection limit is an estimated quantity.
U The analyte was not detected. Associated value is the MRL.
UJ The analyte was not detected above the reported sample quantitation limit. The reported quantitation limit is estimated.

The results of the verification sampling program indicate that no hazardous constituents remain at the TTU. Thus, clean closure of the TTU is demonstrated.

### *Site Restoration*

Conoco completed the backfill and grading of the TTU to the surrounding topography with clean soil from a Refinery stockpile on October 10, 1995. The area will be revegetated with native grass during the next growing season to preserve the integrity of the site and to prevent erosion.

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**Attachment 1**

**INDEPENDENT REGISTERED PROFESSIONAL ENGINEER CLOSURE CERTIFICATION**

I, James F. Neyens, a Professional Engineer registered pursuant to the Professional Engineers registration law of the State of Oklahoma, hereby certify that I have reviewed the Closure Plan for the Thermal Treatment Unit ("unit"), at the Conoco Inc. Ponca City Refinery, Ponca City, Oklahoma, that I am familiar with the rules and regulations of 40 CFR 265.111 pertaining to closure of such unit, that I personally have reviewed field and laboratory documentation for the closure of the aforementioned unit, and that the clean closure of the aforementioned unit has been performed in full and complete accordance with the Closure Plan approved in writing by the Oklahoma Department of Environmental Quality on May 22, 1995, and the rules and regulations of 40 CFR 265.111.

James F. Neyens
(Signature)

NOVEMBER 2, 1995
(Date)

REGISTERED PROFESSIONAL ENGINEER
JAMES F. NEYENS
13403
OKLAHOMA

No. 13403
(Professional Engineering License Number)

Harding Lawson Associates
9800 Richmond, Suite 200
Houston, Texas 77042
(713) 789-8050

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Quanterra Environmental Services

Volatile Organics
Target Compound List (TCL)
Method 8240

Client Name: Conoco Oil
Client ID: S1(INV,TTU,1,6")
Lab ID: 044173-0016-SA
Matrix: SOIL Sampled: 21 AUG 95 Received: 23 AUG 95
Authorized: 23 AUG 95 Prepared: 28 AUG 95 Analyzed: 29 AUG 95

| Parameter | Result | Wet wt. Units | Reporting Limit |
|---|---|---|---|
| Ethyl ether | ND J | ug/kg | 50 |
| Styrene | ND | ug/kg | 5.0 |
| Tetrahydrofuran | ND | ug/kg | 10 |

| Surrogate | Recovery | |
|---|---|---|
| Toluene-d8 | 90 | % |
| 4-Bromofluorobenzene | 102 | % |
| 1,2-Dichloroethane-d4 | 91 | % |

VALIDATED

Reviewed By [signature]
Date 7/27/95

ND = Not detected
NA = Not applicable

Reported By: Paul Reinwald Approved By: Kristin Tollefson

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Quanterra
Environmental Services

Volatile Organics
Target Compound List (TCL)
Method 8240

Client Name: Conoco Oil
Client ID: S1(DUP,TTU,1,6")
Lab ID: 044173-0016-DU
Matrix: SOIL Sampled: 21 AUG 95 Received: 23 AUG 95
Authorized: 23 AUG 95 Prepared: 28 AUG 95 Analyzed: 29 AUG 95

| Parameter | Result | Wet wt. Units | Reporting Limit |
|---|---|---|---|
| Ethyl ether | ND J | ug/kg | 50 |
| Styrene | ND | ug/kg | 5.0 |
| Tetrahydrofuran | ND | ug/kg | 10 |

| Surrogate | Recovery | |
|---|---|---|
| Toluene-d8 | 104 | % |
| 4-Bromofluorobenzene | 99 | % |
| 1,2-Dichloroethane-d4 | 98 | % |

VALIDATED
Reviewed By
Date 7/27/95

ND = Not detected
NA = Not applicable

Reported By: Paul Reinwald Approved By: Kristin Tollefson

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Quanterra Environmental Services

Volatile Organics
Target Compound List (TCL)
Method 8240

Client Name: Conoco Oil
Client ID: S2(INV,TTU,1,6")
Lab ID: 044173-0017-SA
Matrix: SOIL
Authorized: 23 AUG 95

Sampled: 21 AUG 95
Prepared: 28 AUG 95

Received: 23 AUG 95
Analyzed: 29 AUG 95

| Parameter | Result | Wet wt. Units | Reporting Limit |
|---|---|---|---|
| Ethyl ether | ND J | ug/kg | 50 |
| Styrene | ND | ug/kg | 5.0 |
| Tetrahydrofuran | ND | ug/kg | 10 |

| Surrogate | Recovery | |
|---|---|---|
| Toluene-d8 | 108 | % |
| 4-Bromofluorobenzene | 95 | % |
| 1,2-Dichloroethane-d4 | 96 | % |

VALIDATED

Reviewed By: [signature]
Date: 9/27/95

ND = Not detected
NA = Not applicable

Reported By: Paul Reinwald

Approved By: Kristin Tollefson

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Quanterra
Environmental Services

Volatile Organics
Target Compound List (TCL)
Method 8240

Client Name: Conoco Oil
Client ID: S3(INV,TTU,1,6")
Lab ID: 044173-0018-SA
Matrix: SOIL
Authorized: 23 AUG 95

Sampled: 21 AUG 95
Prepared: 28 AUG 95

Received: 23 AUG 95
Analyzed: 29 AUG 95

| Parameter | Result | Wet wt. Units | Reporting Limit |
|---|---|---|---|
| Ethyl ether | ND J | ug/kg | 50 |
| Styrene | ND | ug/kg | 5.0 |
| Tetrahydrofuran | ND | ug/kg | 10 |

| Surrogate | Recovery | |
|---|---|---|
| Toluene-d8 | 111 | % |
| 4-Bromofluorobenzene | 94 | % |
| 1,2-Dichloroethane-d4 | 95 | % |

VALIDATED

Reviewed By

Date 9/27/95

ND = Not detected
NA = Not applicable

Reported By: Paul Reinwald

Approved By: Kristin Tollefson

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Quanterra Environmental Services

# Volatile Organics
## Appendix IX List
## Method 8240

Client Name: Conoco Oil
Client ID: S4(INV,III,1,0-0.5')
Lab ID: 044274-0001-SA
Matrix: SOIL Sampled: 27 AUG 95 Received: 29 AUG 95
Authorized: 29 AUG 95 Prepared: 01 SEP 95 Analyzed: 08 SEP 95

| Parameter | Result | Wet wt. Units | Reporting Limit |
|---|---|---|---|
| Ethyl ether | ND | ug/kg | 50 |
| Styrene | ND | ug/kg | 5.0 |
| Tetrahydrofuran | ND | ug/kg | 10 |

| Surrogate | Recovery | |
|---|---|---|
| Toluene-d8 | 120 | % |
| 4-Bromofluorobenzene | 89 | % |
| 1,2-Dichloroethane-d4 | 100 | % |

VALIDATED
Re... By
Date 9/26/95

ND = Not detected
NA = Not applicable

Reported By: Sandra Jones Approved By: MaryHelen Hand

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Quanterra
Environmental Services

# Volatile Organics
## Appendix IX List
## Method 8240

Client Name: Conoco Oil
Client ID: S5(INV,III,1,0-0.5')
Lab ID: 044274-0002-SA
Matrix: SOIL Sampled: 27 AUG 95 Received: 29 AUG 95
Authorized: 29 AUG 95 Prepared: 01 SEP 95 Analyzed: 08 SEP 95

| Parameter | Result | Wet wt. Units | Reporting Limit |
|---|---|---|---|
| Ethyl ether | ND | ug/kg | 50 |
| Styrene | ND | ug/kg | 5.0 |
| Tetrahydrofuran | ND | ug/kg | 10 |

| Surrogate | Recovery | |
|---|---|---|
| Toluene-d8 | 121 | % |
| 4-Bromofluorobenzene | 84 | % |
| 1,2-Dichloroethane-d4 | 99 | % |

VALIDATED

Reviewed By [signature]
Date 9/26/95

ND = Not detected
NA = Not applicable

Reported By: Sandra Jones Approved By: MaryHelen Hand