Koppers Inc

General Information

ID	Branch	SIC	County	Basin	Start	End
876	Energy and Transportation	2491	Grenada	Yazoo River	11/09/1981	

Address

Physical Address (Primary)	Mailing Address
1 Koppers Drive Tie Plant, MS 38960	PO Box 160 Tie Plant, MS 38960

Telecommunications

Type	Address or Phone
Work phone number	(662) 226-4584, Ext. 11

Alternate / Historic AI Identifiers

Alt ID	Alt Name	Alt Type	Start Date	End Date
2804300012	Koppers Inc	Air-AIRS AFS	10/12/2000	
096000012	Koppers, Inc.	Air-Title V Fee Customer	12/11/2006	
096000012	Koppers Industries, Inc.	Air-Title V Operating	03/11/1997	03/01/2002
096000012	Koppers Industries, Inc.	Air-Title V Operating	01/13/2004	03/26/2007
096000012	Koppers Inc	Air-Title V Operating	03/26/2007	01/01/2009
MSR220005	Koppers Industries, Inc.	GP-Wood Treating	09/25/1992	
MSD007027543	Koppers Industries, Inc.	Hazardous Waste-EPA ID	08/27/1999	
HW8854301	Koppers Industries, Inc.	Hazardous Waste-TSD	06/28/1988	06/28/1998
HW8854301	Koppers Industries, Inc.	Hazardous Waste-TSD	11/10/1999	03/26/2007
HW8854301	Koppers, Inc. (Owner)	Hazardous Waste-TSD	03/26/2007	09/30/2009
876	Koppers Industries, Inc.	Historic Site Name	11/09/1981	12/11/2006
876	Koppers, Inc.	Official Site Name	12/11/2006	
MSP090300	Koppers Industries, Inc.	Water-Pretreatment	11/14/1995	11/13/2000
MSP090300	Koppers Industries, Inc.	Water-Pretreatment	09/18/2001	08/31/2006
MSP090300	Koppers Inc	Water-Pretreatment	03/26/2007	02/28/2012
MSU081080	Koppers Industries, Inc.	Water-SOP	11/09/1981	11/30/1985

Regulatory Programs

Program	SubProgram	Start Date	End Date
Air	Title V - major	06/01/1900	
Hazardous Waste	Large Quantity Generator	08/27/1999	
Hazardous Waste	TSD - Not Classified	06/28/1988	
Water	Baseline Stormwater	01/01/1900	
Water	PT CIU	11/14/1995	
Water	PT CIU - Timber Products Processing (Subpart 429)	11/14/1995	
Water	PT SIU	11/14/1995	

Locational Data

Latitude	Longitude	Metadata	S / T / R	Map Links

33 ° 44 ' 3 .00 (033.734167)	89 ° 47 ' 8 .06 (089.785572)	**Point Desc:** PG- Plant Entrance (General). Data collected by Mike Hardy on 11/8/2005. Elevation 223 feet. Just inside entrance gate. **Method:** GPS Code (Psuedo Range) Standard Position (SA Off) **Datum:** NAD83 **Type:** MDEQ	Section: Township: Range:	SWIMS TerraServer Map It

4/3/2007 12:58:30 PM

Mississippi Department of Environmental Quality
Office of Pollution Control

I-sys 2000 Master Site Detail Report

Site Name: Koppers Industries Inc

PHYSICAL ADDRESS	
LINE 1:	Tie Plant Road
LINE 2:	
LINE 3:	
MUNICIPALITY:	Tie Plant
STATE CODE:	MS
ZIP CODE:	38960-

MAILING ADDRESS	
LINE 1:	PO Box 160
LINE 2:	
LINE 3:	
MUNICIPALITY:	Tie Plant
STATE CODE:	MS
ZIP CODE:	38960-

OTHER INFORMATION	
MASTER ID:	000876
COUNTY:	Grenada
REGION	NRO
SIC 1:	2491
AIR TYPE:	TITLE V
HW TYPE:	TSD
SOLID TYPE:	
WATER TYPE:	INDUSTRIAL
BRANCH:	Energy
ECED CONTACT:	
Collier, Melissa	
BASIN:	

AIR PROGRAMS ☑ SIP ☐ PSD ☐ NSPS ☐ NESHAPS ☐ MACT

Mississippi Department of Environmental Quality
Office of Pollution Control

Pemits

PROGRAM	PERMIT TYPE	PERMIT #	MDEQ PERMIT CONTACT	ACTIVE
AIR	TITLE V	096000012	Burchfield, David	YES
WATER	PRE-TREATMENT	MSP090300	Collins, Bryan	YES
HAZ. WASTE	TSD	HW8854301		YES
HAZ. WASTE	EPA ID	MSD007027543		YES
HAZ. WASTE	TSD	HW8854301	Stover, Wayne	YES

Compliance Actions

MEDIA	ACTIVITY TYPE	SCHEDULED	COMPLETED	INSPECTED B
HAZ WASTE	Financial Record Review	1/18/00	1/18/00	Twitty, Russ
WATER	CMI - PRETREATMENT			Whittington, Darryail
WATER	CEI - PRETREATMENT	9/30/00		Twitty, Russ
WATER	CEI - NA	9/30/00		Twitty, Russ
HAZ WASTE	Compliance Evaluation Inspection	9/30/00		Twitty, Russ
AIR	State Compliance Inspection	9/30/00		Twitty, Russ
WATER	CEI - NA	3/2/99	3/2/99	Twitty, Russ
HAZ WASTE	Compliance Evaluation Inspection	3/2/99	3/2/99	Twitty, Russ
AIR	State Compliance Inspection	3/2/99	3/2/99	Twitty, Russ

Koppers Company, Inc.
Environmental Resources Depart
Pittsburgh, PA 15219, Telephone 27-2000

CERTIFIED MAIL

KOPPERS

June 6, 1984

Mr. John Herrmann
Bureau of Pollution Control
Division of Solid Waste Management
Mississippi Department of Natural Resources
P. O. Box 10385
Jackson, MS. 39209

RE: Part A Revision
MSD 007027543
Tie Plant, MS.

Dear Mr. Herrmann:

Enclosed is Koppers' Application to revise its Part A Permit. The intent of the revised Part A is to allow construction of a steel frame building on a strong structural concrete base. The building will be located near the hazardous waste feeder hopper to our wood waste, cogeneration boiler.

We have also indicated an increase in storage capacity within this building. It appears that reuseable "TOTE" Tanks (DOT approved) will provide us with the ability to handle waste more safety, efficiently and economically than with 55 gallon drums. This capacity is needed to make better use of co-generation boiler.

If the application is accepted and approved, Koppers will contact you with detailed design information before beginning construction. It is our intent to design and build this facility so that it is acceptable in our Part B Application.

Preliminary cost estimates show that the proposed building is for less than 50% of the cost to replace our existing facilities:

COST OF NEW FACILITY

Metal Building (erected) 32' x 32' - 10' x 20' Door	$ 10,240.00
Structural Concrete Slab	4,125.00
TOTAL	$ 14,365.00

continued

Writer's Direct Dial Number _____

APPROX. COST OF REPLACEMENT OF EXISTING FACILITY

Surface Impoundment 26,980 sq.ft. x 10' = 269,800 sq.ft. 1000 cu.yd.	$ 475,000.
Storage Area Pad & Walls	$ 9,000.
TOTAL	$ 484,000.

We would appreciate your review and comments on these plans as soon as possible.

Sincerely yours,

Charles Brush

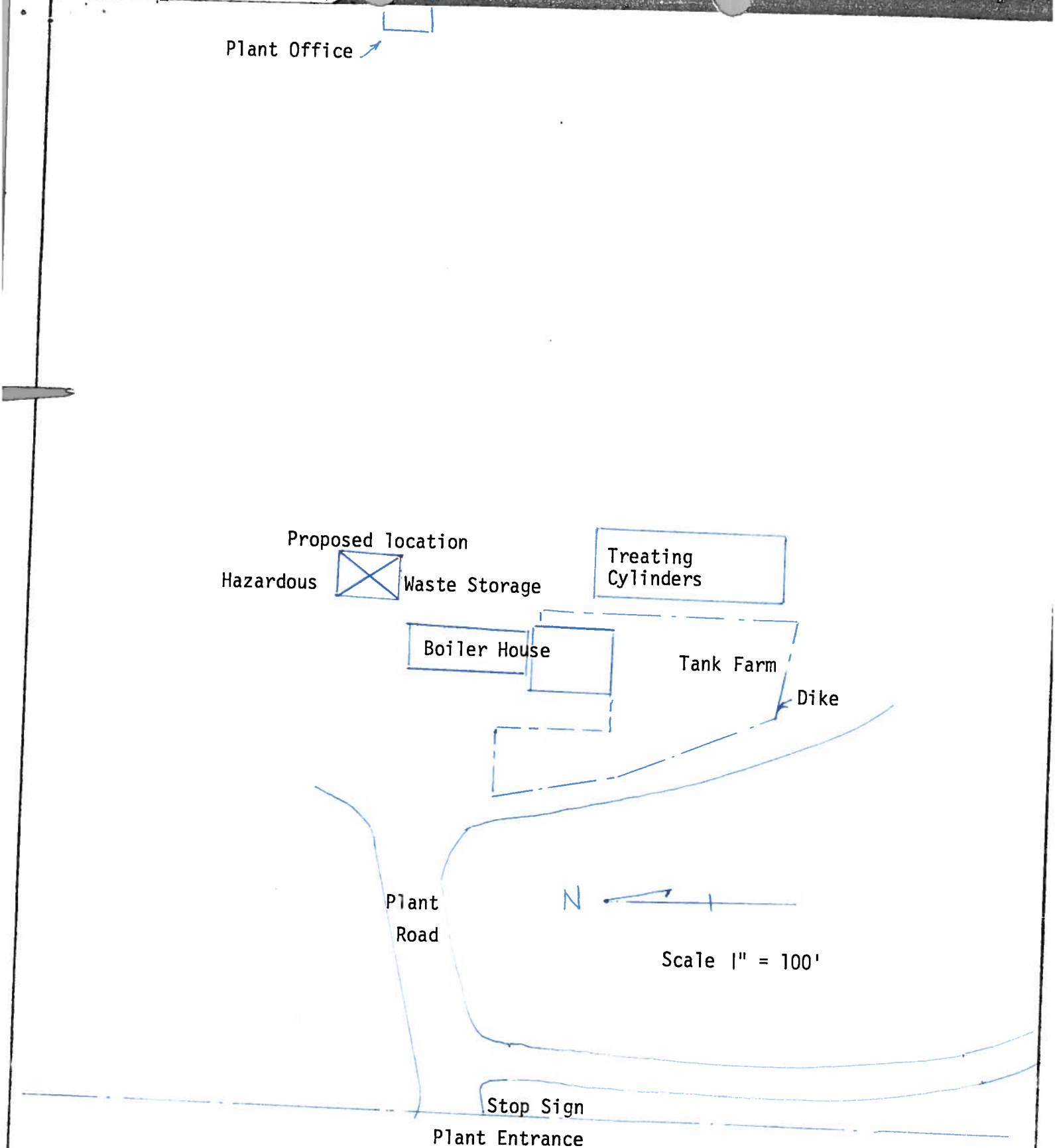
Charles P. Brush, P.E.

CPB/s
encl.

cc: R. C. Bartlow - w/encl.
R. K. Wagner
R. S. Ohlis
T. A. Marr

V. FACILITY DRAWING *(see page 4)*

Form Approved OMB No. 158-S80004



Please print or type in the unshaded areas only
(fill—in areas are spaced for elite type, i.e., 12 characters/inch).

Form Approved OMB No. 158-R0175

FORM 1 GENERAL

EPA

ENVIRONMENTAL PROTECTION AGENCY

GENERAL INFORMATION

Consolidated Permits Program

(Read the "General Instructions" before starting.)

I. EPA I.D. NUMBER

F M S D 0 0 7 0 2 7 5 4 3

LABEL ITEMS

- I. EPA I.D. NUMBER
- III. FACILITY NAME
- V. FACILITY MAILING ADDRESS
- VI. FACILITY LOCATION

PLEASE PLACE LABEL IN THIS SPACE

GENERAL INSTRUCTIONS

If a preprinted label has been provided, aff
It in the designated space. Review the infor
ation carefully; if any of it is incorrect, cro
through it and enter the correct data in t
appropriate fill—in area below. Also, if any
the preprinted data is absent *(the area to t
left of the label space lists the informatio
that should appear)*, please provide it in t
proper fill—in area*(s)* below. If the label
complete and correct, you need not comple
Items I, III, V, and VI *(except VI-B whic
must be completed regardless)*. Complete a
items if no label has been provided. Refer t
the instructions for detailed item descri
tions and for the legal authorizations und
which this data is collected.

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of bold—faced terms.

SPECIFIC QUESTIONS	MARK 'X' YES	NO	FORM ATTACHED
A. Is this facility a **publicly owned treatment works** which results in a **discharge** to **waters of the U.S.**? (FORM 2A)		X	
C. Is this a facility which currently results in **discharges** to **waters of the U.S.** other than those described in A or B above? (FORM 2C)		X	
E. Does or will this facility treat, store, or dispose of **hazardous wastes**? (FORM 3)	X		X
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		X	
I. Is this facility a proposed **stationary source** which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an **attainment area**? (FORM 5)		X	

SPECIFIC QUESTIONS	MARK 'X' YES	NO	FORM ATTACH
B. Does or will this facility *(either existing or proposed)* include a **concentrated animal feeding operation** or **aquatic animal production facility** which results in a **discharge** to **waters of the U.S.**? (FORM 2B)		X	
D. Is this a proposed facility *(other than those described in A or B above)* which will result in a **discharge** to **waters of the U.S.**? (FORM 2D)		X	
F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)		X	
H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)		X	
J. Is this facility a proposed **stationary source** which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an **attainment area**? (FORM 5)		X	

III. NAME OF FACILITY

1 SKIP: KOPPERS COMPANY INC

IV. FACILITY CONTACT

A. NAME & TITLE *(last, first, & title)*	B. PHONE *(area code & no.)*
2 BARTLOW RAYMOND PLANT MANAGER	601 226 4584

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX

3 BOX 160

B. CITY OR TOWN	C. STATE	D. ZIP CODE
4 TIE PLANT	MS	38960

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER

5 TIE PLANT ROAD

B. COUNTY NAME

GRENADA

C. CITY OR TOWN	D. STATE	E. ZIP CODE	F. COUNTY CODE *(if known)*
6 TIE PLANT	MS	38060	

CONTINUE ON REVERSE

CONTINUED FROM THE FRONT

VII. SIC CODES (4-digit, in order of priority)

A. FIRST	B. SECOND
2491 (specify) Wood Preserving	(specify) Not Applicable
C. THIRD	**D. FOURTH**
(specify) Not Applicable	(specify) Not Applicable

VIII. OPERATOR INFORMATION

A. NAME: KOPPERS COMPANY INC

B. Is the name listed in Item VIII-A also the owner? [X] YES [ ] NO

C. STATUS OF OPERATOR (Enter the appropriate letter into the answer box; if "Other", specify.)
F = FEDERAL; S = STATE; P = PRIVATE; M = PUBLIC (other than federal or state); O = OTHER (specify)
P (specify)

D. PHONE (area code & no.): 412 227 2000

E. STREET OR P.O. BOX: 436 SEVENTH AVE

F. CITY OR TOWN: PITTSBRUGH

G. STATE: PA

H. ZIP CODE: 15219

IX. INDIAN LAND

Is the facility located on Indian lands? [ ] YES [X] NO

X. EXISTING ENVIRONMENTAL PERMITS

A. NPDES (Discharges to Surface Water): NOT APPLICABLE	**D. PSD** (Air Emissions from Proposed Sources): NOT APPLICABLE
B. UIC (Underground Injection of Fluids): NOT APPLICABLE	**E. OTHER** (specify): 76 024 (specify) Zero Discharge-Effluent
C. RCRA (Hazardous Wastes): MSD007027543	**E. OTHER** (specify): 0960-00012 (specify) Woodwaste Boiler - Air

XI. MAP

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

XII. NATURE OF BUSINESS (provide a brief description)

This plant produces pressure treated wood products using the pressure treatment processes. The treatment chemicals include petroleum oils, pentachlorophenol, coal tar and creosote

XIII. CERTIFICATION (see instructions)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE (type or print)	B. SIGNATURE	C. DATE SIGNED
Robert K. Wagner - Vice President General Manager Treated Wood Products	RK Wagner	6.5.84

COMMENTS FOR OFFICIAL USE ONLY

Please print or type in the unshaded areas only
(fill—in areas are spaced for elite type, i.e., 12 characters/inch).

Form Approved OMB No. 158-S80004

FORM 3 RCRA

U.S. ENVIRONMENTAL PROTECTION AGENCY

HAZARDOUS WASTE PERMIT APPLICATION

Consolidated Permits Program

(This information is required under Section 3005 of RCRA.)

I. EPA I.D. NUMBER

S													T/A
F	M	S	D	0	0	7	0	2	7	5	4	3	
1	2											13	14

FOR OFFICIAL USE ONLY

APPLICATION APPROVED	DATE RECEIVED (yr., mo., & day)	COMMENTS
23	24 - 29	

II. FIRST OR REVISED APPLICATION

Place an "X" in the appropriate box in A or B below *(mark one box only)* to indicate whether this is the first application you are submitting for your facility or a revised application. If this is your first application and you already know your facility's EPA I.D. Number, or if this is a revised application, enter your facility's EPA I.D. Number in Item I above.

A. FIRST APPLICATION *(place an "X" below and provide the appropriate date)*

☐ 71 1. EXISTING FACILITY *(See instructions for definition of "existing" facility. Complete item below.)*

FOR EXISTING FACILITIES, PROVIDE THE DATE (yr., mo., & day) OPERATION BEGAN OR THE DATE CONSTRUCTION COMMENCED *(use the boxes to the left)*

C	YR.	MO.	DAY
8	0 4	0 1	0 1
15	73 74	75 76	77 78

☐ 71 2. NEW FACILITY *(Complete item below.)*

FOR NEW FACILITIES PROVIDE THE DATE (yr., mo., & day) OPERATION BEGAN OR IS EXPECTED TO BEGIN

YR.	MO.	DAY
73 74	75 76	77 78

B. REVISED APPLICATION *(place an "X" below and complete Item I above)*

☐ 72 1. FACILITY HAS INTERIM STATUS

☐ 72 2. FACILITY HAS A RCRA PERMIT

III. PROCESSES — CODES AND DESIGN CAPACITIES

A. PROCESS CODE — Enter the code from the list of process codes below that best describes each process to be used at the facility. Ten lines are provided for entering codes. If more lines are needed, enter the code(s) in the space provided. If a process will be used that is not included in the list of codes below, then describe the process *(including its design capacity)* in the space provided on the form *(Item III-C)*.

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

1. AMOUNT — Enter the amount.
2. UNIT OF MEASURE — For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the unit of measure used. Only the units of measure that are listed below should be used.

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Storage:		
CONTAINER *(barrel, drum, etc.)*	S01	GALLONS OR LITERS
TANK	S02	GALLONS OR LITERS
WASTE PILE	S03	CUBIC YARDS OR CUBIC METERS
SURFACE IMPOUNDMENT	S04	GALLONS OR LITERS
Disposal:		
INJECTION WELL	D79	GALLONS OR LITERS
LANDFILL	D80	ACRE-FEET *(the volume that would cover one acre to a depth of one foot)* OR HECTARE-METER
LAND APPLICATION	D81	ACRES OR HECTARES
OCEAN DISPOSAL	D82	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	D83	GALLONS OR LITERS

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Treatment:		
TANK	T01	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	T02	GALLONS PER DAY OR LITERS PER DAY
INCINERATOR	T03	TONS PER HOUR OR METRIC TONS PER HOUR; GALLONS PER HOUR OR LITERS PER HOUR
OTHER *(Use for physical, chemical, thermal or biological treatment processes not occurring in tanks, surface impoundments or incinerators. Describe the processes in the space provided; Item III-C.)*	T04	GALLONS PER DAY OR LITERS PER DAY

UNIT OF MEASURE	UNIT OF MEASURE CODE
GALLONS	G
LITERS	L
CUBIC YARDS	Y
CUBIC METERS	C
GALLONS PER DAY	U

UNIT OF MEASURE	UNIT OF MEASURE CODE
LITERS PER DAY	V
TONS PER HOUR	D
METRIC TONS PER HOUR	W
GALLONS PER HOUR	E
LITERS PER HOUR	H

UNIT OF MEASURE	UNIT OF MEASURE CODE
ACRE-FEET	A
HECTARE-METER	F
ACRES	B
HECTARES	Q

EXAMPLE FOR COMPLETING ITEM III *(shown in line numbers X-1 and X-2 below)*: A facility has two storage tanks, one tank can hold 200 gallons and the other can hold 400 gallons. The facility also has an incinerator that can burn up to 20 gallons per hour.

S			T/A	C
C	D U P			1
1	2 - 13		14	15

LINE NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT (specify)	B. PROCESS DESIGN CAPACITY 2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY
	16 - 18	19 - 27	28	29 - 32
X-1	S 0 2	~~XXX~~	G	
X-2	T 0 3	~~XX~~	E	
1	S 0 4	65	Y	
2	S 0 1	21,400	G	
3				
4				

LINE NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT	B. PROCESS DESIGN CAPACITY 2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY
	16 - 18	19 - 27	28	29 - 32
5				
6				
7				
8				
9				
10				

CONTINUE ON REVERSE

Continued from the front.

III. PROCESSES *(continued)*

C. SPACE FOR ADDITIONAL PROCESS CODES OR FOR DESCRIBING OTHER PROCESSES *(code "T04")*. FOR EACH PROCESS ENTERED HERE INCLUDE DESIGN CAPACITY.

NOT APPLICABLE

IV. DESCRIPTION OF HAZARDOUS WASTES

A. EPA HAZARDOUS WASTE NUMBER – Enter the four–digit number from 40 CFR, Subpart D for each listed hazardous waste you will handle. If you handle hazardous wastes which are not listed in 40 CFR, Subpart D, enter the four–digit number*(s)* from 40 CFR, Subpart C that describes the characteristics and/or the toxic contaminants of those hazardous wastes.

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

C. UNIT OF MEASURE – For each quantity entered in column B enter the unit of measure code. Units of measure which must be used and the appropriate codes are:

ENGLISH UNIT OF MEASURE	CODE
POUNDS	P
TONS	T

METRIC UNIT OF MEASURE	CODE
KILOGRAMS	K
METRIC TONS	M

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

D. PROCESSES

1. PROCESS CODES:
   For listed hazardous waste: For each **listed** hazardous waste entered in column A select the code*(s)* from the list of process codes contained in Item III to indicate how the waste will be stored, treated, and/or disposed of at the facility.
   For non–listed hazardous wastes: For each characteristic or toxic contaminant entered in column A, select the code*(s)* from the list of process codes contained in Item III to indicate all the processes that will be used to store, treat, and/or dispose of all the non–listed hazardous wastes that possess that characteristic or toxic contaminant.
   Note: Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter "000" in the extreme right box of Item IV-D(1); and (3) Enter in the space provided on page 4, the line number and the additional code*(s)*.

2. PROCESS DESCRIPTION: If a code is not listed for a process that will be used, describe the process in the space provided on the form.

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

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

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

LINE NO.	A. EPA HAZARD. WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	D. PROCESSES 2. PROCESS DESCRIPTION (if a code is not entered in D(1))
X-1	K 0 5 4	900	P	T 0 3 D 8 0	
X-2	D 0 0 2	400	P	T 0 3 D 8 0	
X-3	D 0 0 1	100	P	T 0 3 D 8 0	
X-4	D 0 0 2				included with above

Continued from page 2.
NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

Form Approved OMB No. 158-S80004

EPA I.D. NUMBER (enter from page 1): W M S D 0 0 7 0 2 7 5 4 3 | T/A: | C: 1

FOR OFFICIAL USE ONLY: W DUP | T/A: | C: 2 | DUP

IV. DESCRIPTION OF HAZARDOUS WASTES (continued)

LINE NO.	A. EPA HAZARD. WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	D. PROCESSES 2. PROCESS DESCRIPTION (if a code is not entered in D(1))
1	K001	2500	P	S04	Storage in surface impoundment
2	U051	1000	P	S01	Container Storage
3	U242	1000	P	S01	Container Storage
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					

CONTINUE ON REVERSE

Continued from the front.

IV. DESCRIPTION OF HAZARDOUS WAST (continued)

E. USE THIS SPACE TO LIST ADDITIONAL PROCESS CODES FROM ITEM D(1) ON PAGE 3.

The increase in storage capacity is related to a change in storage containers from only 55 gallon drums to a system including "TOTE" tanks of 446 gallon capacity.

Additional capacity is also necessary to provide the storage capacity needed to receive and hold hazardous waste being recycled in the plant's new cogeneraiton, wood fired boiler house. The boiler is permitted under the Clean Air Act to use Koppers specific wastes as fuels.

EPA I.D. NO. (enter from page 1)

													T/A	C
F	M	S	D	0	0	7	0	2	7	5	4	3		6

V. FACILITY DRAWING

All existing facilities must include in the space provided on page 5 a scale drawing of the facility *(see instructions for more detail)*.

VI. PHOTOGRAPHS

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

VII. FACILITY GEOGRAPHIC LOCATION

LATITUDE (degrees, minutes, & seconds)	LONGITUDE (degrees, minutes, & seconds)
33 44 04	89 47 19

VIII. FACILITY OWNER

[X] A. If the facility owner is also the facility operator as listed in Section VIII on Form 1, "General Information", place an "X" in the box to the left and skip to Section IX below.

B. If the facility owner is not the facility operator as listed in Section VIII on Form 1, complete the following items:

1. NAME OF FACILITY'S LEGAL OWNER	2. PHONE NO. (area code & no.)
E	

3. STREET OR P.O. BOX	4. CITY OR TOWN	5. ST.	6. ZIP CODE
F	G		

IX. OWNER CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME (print or type)	B. SIGNATURE	C. DATE SIGNED
Robert K. Wagner, Vice President General Manager, Treated Wood Products	R K Wagner	6.5.84

X. OPERATOR CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME (print or type)	B. SIGNATURE	C. DATE SIGNED

CONTINUE ON PAGE 5

P.O. Box 160, Tie Plant, MS 38960
Telephone 601-226-4584

Architectural and
Construction Materials

June 30, 1981

EPA Region IV
RCRA Activities
345 Courtland St., N.E.
Atlanta, Ga. 30365

Re: Application for a Hazardous Waste Permit
EPA I.D. No.: MSD 007027543

Dear Mr. Harvanek:

Enclosed is our Part A of the RCRA permit application with the following changes:

Form 1-V. Facility mailing address.
State changed to Ms.
Form 3-III-C. Line 2 process design capacity changed to 38,000 gallons.
Form 3-IV-D. Line 1. Process code changed to SO4.

Sincerely,

R. C. Bartlow
Plant Manager

RCB/dm

cc: File

Koppers - Pittsburgh - Charles Bond.
412-227-2000.

FORM 1 GENERAL

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERAL INFORMATION

Consolidated Permits Program

(Read the "General Instructions" before starting.)

I. EPA I.D. NUMBER

F

LABEL ITEMS

I. EPA I.D. NUMBER

III. FACILITY NAME

V. FACILITY MAILING ADDRESS

VI. FACILITY LOCATION

PLEASE PLACE LABEL IN THIS SPACE

GENERAL INSTRUCTIONS

If a preprinted label has been provided, it in the designated space. Review the in ation carefully; if any of it is incorrect, through it and enter the correct data appropriate fill—in area below. A so, if a the preprinted data is absent *(the area t left of the label space lists the inform that should appear)*, please provide t proper fill—in area(s) below. If the la complete and correct, you need not com Items I, III, V, and VI *(except VI-B must be completed regardless)*. Comp et Items if no label has been provided. Ref the instructions for detailed item de tions and for the legal authorizations which this data is collected.

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to ar questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third co um if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activi is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of bold—faced terms.

SPECIFIC QUESTIONS	MARK 'X' YES	NO	FORM ATTACHED
A. Is this facility a **publicly owned treatment works** which results in a **discharge** to **waters of the U.S.**? (FORM 2A)		X	
B. Does or will this facility *(either existing or proposed)* include a **concentrated animal feeding operation** or **aquatic animal production facility** which results in a **discharge** to **waters of the U.S.**? (FORM 2B)		X	
C. Is this a facility which currently results in **discharges** to **waters of the U.S.** other than those described in A or B above? (FORM 2C)		X	
D. Is this a proposed facility *(other than those described in A or B above)* which will result in a **discharge** to **waters of the U.S.**? (FORM 2D)		X	
E. Does or will this facility treat, store, or dispose of **hazardous wastes**? (FORM 3)	X		X
F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)		X	
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		X	
H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)		X	
I. Is this facility a proposed **stationary source** which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an **attainment area**? (FORM 5)		X	
J. Is this facility a proposed **stationary source** which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an **attainment area**? (FORM 5)		X	

III. NAME OF FACILITY

1 SKIP: KOPPERS COMPANY INC

IV. FACILITY CONTACT

A. NAME & TITLE *(last, first, & title)*	B. PHONE *(area code & no.)*
2 BARTLOW RAYMOND PLANT MANAGER	601 226 4584

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX

3 BOX 160

B. CITY OR TOWN	C. STATE	D. ZIP CODE
4 TIE PLANT	MS	38960

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER

5 NOT APPLICABLE

B. COUNTY NAME

GRENADA

C. CITY OR TOWN	D. STATE	E. ZIP CODE	F. COUNTY CODE *(if known)*
6 TIE PLANT	MS	38960	

CONTINUE ON REVERS

CONTINUED FROM THE FRONT

VII. SIC CODES (4-digit, in order of priority)

A. FIRST	B. SECOND
2491 (specify) WOOD PRESERVING	(specify) NOT APPLICABLE

C. THIRD	D. FOURTH
(specify) NOT APPLICABLE	(specify) NOT APPLICABLE

VIII. OPERATOR INFORMATION

A. NAME

KOPPERS COMPANY INC

B. Is the name listed in Item VIII-A also owner? [X] YES [ ] NO

C. STATUS OF OPERATOR (Enter the appropriate letter into the answer box; if "Other", specify.)

F = FEDERAL
S = STATE
P = PRIVATE
M = PUBLIC (other than federal or state)
O = OTHER (specify)

D (specify)

D. PHONE (area code & no.) A 412 227 2000

E. STREET OR P.O. BOX

KOPPERS BUILDING

F. CITY OR TOWN

PITTSBURGH

G. STATE PA

H. ZIP CODE 15219

IX. INDIAN LAND

Is the facility located on Indian lands? [ ] YES [X] NO

X. EXISTING ENVIRONMENTAL PERMITS

A. NPDES (Discharges to Surface Water)	D. PSD (Air Emissions from Proposed Sources)
9 N N/A	9 P N/A

B. UIC (Underground Injection of Fluids)	E. OTHER (specify)	
9 U N/A	9 76-024 STATE	(specify) Effluent Zero Discharge

C. RCRA (Hazardous Wastes)	E. OTHER (specify)	
9 R N/A	9 N/A	(specify)

XI. MAP

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

XII. NATURE OF BUSINESS (provide a brief description)

The plant deals with the preservation of wood products utilizing pressure treatment process. The preservation process utilizes petroleum and coal tar base products.

XIII. CERTIFICATION (see instructions)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE (type or print)	B. SIGNATURE	C. DATE SIGNED
Robert K. Wagner - Vice President & General Mgr., Treated Wood Products Div.		10-14-80

COMMENTS FOR OFFICIAL USE ONLY

C

Form Approved OMB No. 158-S80004

FORM 3 RCRA — EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

HAZARDOUS WASTE PERMIT APPLICATION

Consolidated Permits Program

(This information is required under Section 3005 of RCRA.)

I. EPA I.D. NUMBER

F | M S D 0 0 7 0 2 7 5 4 3

FOR OFFICIAL USE ONLY

APPLICATION APPROVED	DATE RECEIVED (yr., mo., & day)	COMMENTS

II. FIRST OR REVISED APPLICATION

Place an "X" in the appropriate box in A or B below *(mark one box only)* to indicate whether this is the first application you are submitting for your facility or a revised application. If this is your first application and you already know your facility's EPA I.D. Number, or if this is a revised application, enter your facility's EPA I.D. Number in Item I above.

A. FIRST APPLICATION *(place an "X" below and provide the appropriate date)*

[X] 1. EXISTING FACILITY *(See instructions for definition of "existing" facility. Complete item below.)*

[ ] 2. NEW FACILITY *(Complete item below.)*

C	YR.	MO.	DAY
8	04	01	01

FOR EXISTING FACILITIES, PROVIDE THE DATE *(yr., mo., & day)* OPERATION BEGAN OR THE DATE CONSTRUCTION COMMENCED *(use the boxes to the left)*

YR.	MO.	DAY

FOR NEW FACILITIES, PROVIDE THE DATE *(yr., mo., & day)* OPERATION BEGAN OR IS EXPECTED TO BEGIN

B. REVISED APPLICATION *(place an "X" below and complete Item I above)*

[ ] 1. FACILITY HAS INTERIM STATUS

[ ] 2. FACILITY HAS A RCRA PERMIT

III. PROCESSES – CODES AND DESIGN CAPACITIES

A. PROCESS CODE – Enter the code from the list of process codes below that best describes each process to be used at the facility. Ten lines are provided for entering codes. If more lines are needed, enter the code*(s)* in the space provided. If a process will be used that is not included in the list of codes below, then describe the process *(including its design capacity)* in the space provided on the form *(Item III-C)*.

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

1. AMOUNT – Enter the amount.
2. UNIT OF MEASURE – For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the unit of measure used. Only the units of measure that are listed below should be used.

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Storage:		
CONTAINER *(barrel, drum, etc.)*	S01	GALLONS OR LITERS
TANK	S02	GALLONS OR LITERS
WASTE PILE	S03	CUBIC YARDS OR CUBIC METERS
SURFACE IMPOUNDMENT	S04	GALLONS OR LITERS
Disposal:		
INJECTION WELL	D79	GALLONS OR LITERS
LANDFILL	D80	ACRE-FEET *(the volume that would cover one acre to a depth of one foot)* OR HECTARE-METER
LAND APPLICATION	D81	ACRES OR HECTARES
OCEAN DISPOSAL	D82	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	D83	GALLONS OR LITERS
Treatment:		
TANK	T01	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	T02	GALLONS PER DAY OR LITERS PER DAY
INCINERATOR	T03	TONS PER HOUR OR METRIC TONS PER HOUR; GALLONS PER HOUR OR LITERS PER HOUR
OTHER *(Use for physical, chemical, thermal or biological treatment processes not occurring in tanks, surface impoundments or incinerators. Describe the processes in the space provided; Item III-C.)*	T04	GALLONS PER DAY OR LITERS PER DAY

UNIT OF MEASURE	UNIT OF MEASURE CODE
GALLONS	G
LITERS	L
CUBIC YARDS	Y
CUBIC METERS	C
GALLONS PER DAY	U
LITERS PER DAY	V
TONS PER HOUR	D
METRIC TONS PER HOUR	W
GALLONS PER HOUR	E
LITERS PER HOUR	H
ACRE-FEET	A
HECTARE-METER	F
ACRES	B
HECTARES	Q

EXAMPLE FOR COMPLETING ITEM III *(shown in line numbers X-1 and X-2 below)*: A facility has two storage tanks, one tank can hold 200 gallons and the other can hold 400 gallons. The facility also has an incinerator that can burn up to 20 gallons per hour.

C	DUP	T/A	C
C	DUP		1

LINE NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT (specify)	2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY
X-1	S 0 2	600	G	
X-2	T 0 3	20	E	
1	S 0 1	5000	G	
2	S 0 4	38000	G	
3				
4				
5				
6				
7				
8				
9				
10				

III. PROCESSES *(continued)*

C. SPACE FOR ADDITIONAL PROCESS CODES OR DESCRIBING OTHER PROCESSES *(code "T")*. FOR EACH PROCESS ENTERED HERE INCLUDE DESIGN CAPACITY.

NOT APPLICABLE

IV. DESCRIPTION OF HAZARDOUS WASTES

A. EPA HAZARDOUS WASTE NUMBER – Enter the four–digit number from 40 CFR, Subpart D for each listed hazardous waste you will handle. If you handle hazardous wastes which are not listed in 40 CFR, Subpart D, enter the four–digit number*(s)* from 40 CFR, Subpart C that describes the characteristics and/or the toxic contaminants of those hazardous wastes.

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

C. UNIT OF MEASURE – For each quantity entered in column B enter the unit of measure code. Units of measure which must be used and the appropriate codes are:

ENGLISH UNIT OF MEASURE	CODE	METRIC UNIT OF MEASURE	CODE
POUNDS	P	KILOGRAMS	K
TONS	T	METRIC TONS	M

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

D. PROCESSES

1. PROCESS CODES:
   For listed hazardous waste: For each **listed** hazardous waste entered in column A select the code*(s)* from the list of process codes contained in Item III to indicate how the waste will be stored, treated, and/or disposed of at the facility.
   For non–listed hazardous wastes: For each characteristic or toxic contaminant entered in column A, select the code*(s)* from the list of process codes contained in Item III to indicate **all** the processes that will be used to store, treat, and/or dispose of all the non–listed hazardous wastes that possess that characteristic or toxic contaminant.
   Note: Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter "000" in the extreme right box of Item IV-D(1); and (3) Enter in the space provided on page 4, the line number and the additional code*(s)*.

2. PROCESS DESCRIPTION: If a code is not listed for a process that will be used, describe the process in the space provided on the form.

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

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

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

LINE NO.	A. EPA HAZARD. WASTE NO (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	D. PROCESSES 2. PROCESS DESCRIPTION (if a code is not entered in D(1))
X-1	K 0 5 4	900	P	T 0 3 D 8 0	
X-2	D 0 0 2	400	P	T 0 3 D 8 0	
X-3	D 0 0 1	100	P	T 0 3 D 8 0	
X-4	D 0 0 2				included with above

NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

Form Approved OMB No. 158-S80004

EPA I.D. NUMBER (enter from page 1)

S	W	M	S	D	0	7	2	7	5	4	3	T/A	C
1	2									13	14	15	

FOR OFFICIAL USE ONLY

S	W	DUP	T/A	C	DUP
1	2		13	14	15 23 - 28

IV. DESCRIPTION OF HAZARDOUS WASTES (continued)

LINE NO.	A. EPA HAZARD. WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	D. PROCESSES 2. PROCESS DESCRIPTION (if a code is not entered in D(1))
	23 - 26	27 - 35	36	27 - 29 / 27 - 29 / 27 - 29 / 27 - 29	
1	K 0 0 1	2500	P	S 0 4	
2	P 0 9 0	1000	P	S 0 1	
3	U 0 5 1	1000	P	S 0 1	
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					

EPA Form 3510-3 (6-80)

CONTINUE ON REVER

IV. DESCRIPTION OF HAZARDOUS WASTES *(continued)*

E. USE THIS SPACE TO LIST ADDITIONAL PROCESS CODES FROM ITEM D(1) ON PAGE

NOT APPLICABLE

EPA I.D. NO. *(enter from page 1)*

F	M	S	D	0	0	7	0	2	7	5	4	3	T/A 3	C 6

V. FACILITY DRAWING

All existing facilities must include in the space provided on page 5 a scale drawing of the facility *(see instructions for more detail).*

VI. PHOTOGRAPHS

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

VII. FACILITY GEOGRAPHIC LOCATION

LATITUDE *(degrees, minutes, & seconds)*	LONGITUDE *(degrees, minutes, & seconds)*
33 44 — 04 0 —	089 47 — 19 0 —

VIII. FACILITY OWNER

☒ A. If the facility owner is also the facility operator as listed in Section VIII on Form 1, "General Information", place an "X" in the box to the left and skip to Section IX below.

B. If the facility owner is not the facility operator as listed in Section VIII on Form 1, complete the following items:

1. NAME OF FACILITY'S LEGAL OWNER	2. PHONE NO. *(area code & no.)*
E NOT APPLICABLE	

3. STREET OR P.O. BOX	4. CITY OR TOWN	5. ST.	6. ZIP CODE
F	G		

IX. OWNER CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME *(print or type)*	B. SIGNATURE	C. DATE SIGNED
Robert K. Wagner Vice President & General Mgr. Treated Wood Products Div.		10-14-80

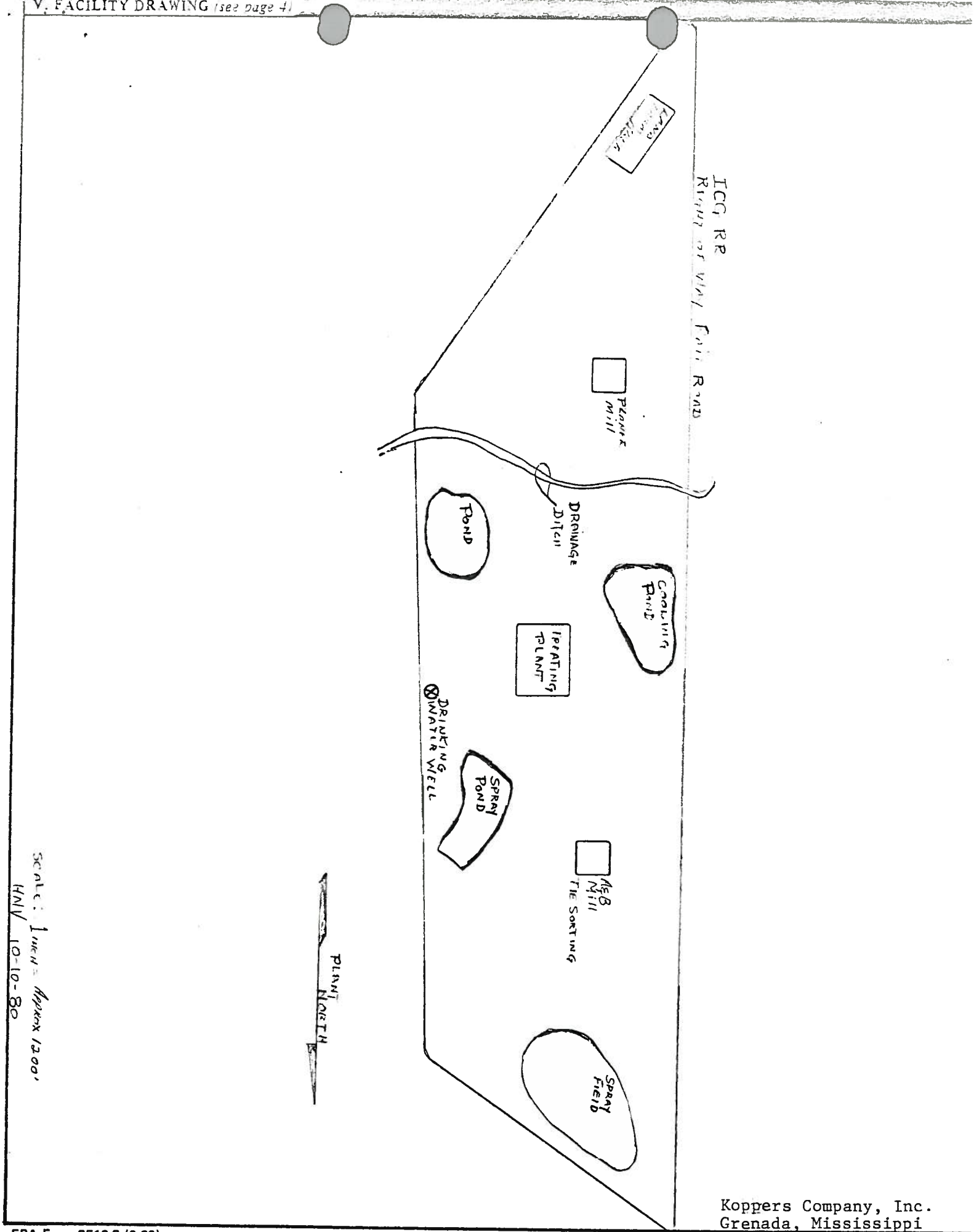
X. OPERATOR CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME *(print or type)*	B. SIGNATURE	C. DATE SIGNED

Form Approved OMB No. 158-S80004

V. FACILITY DRAWING (see page 4)



Koppers Company, Inc.
Grenada, Mississippi

Please print or type in the unshaded areas only
(fill-in areas are spaced for elite type, i.e., 12 characters/inch).

Form Approved OMB No. 158-R0175

FORM 1 GENERAL

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERAL INFORMATION

Consolidated Permits Program

(Read the "General Instructions" before starting.)

I. EPA I.D. NUMBER

F

LABEL ITEMS

I. EPA I.D. NUMBER

III. FACILITY NAME

V. FACILITY MAILING ADDRESS

VI. FACILITY LOCATION

PLEASE PLACE LABEL IN THIS SPACE

GENERAL INSTRUCTIONS

If a preprinted label has been provided, af it in the designated space. Review the info ation carefully; if any of it is incorrect, cr through it and enter the correct data in appropriate fill-in area below. Also, if any the preprinted data is absent *(the area to left of the label space lists the informat that should appear)*, please provide it in proper fill-in area(s) below. If the label complete and correct, you need not compl Items I, III, V, and VI *(except VI-B wh must be completed regardless)*. Complete Items if no label has been provided. Refer the instructions for detailed item descr tions and for the legal authorizations un which this data is collected.

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of bold-faced terms.

SPECIFIC QUESTIONS	MARK 'X' YES	NO	FORM ATTACHED
A. Is this facility a **publicly owned treatment works** which results in a **discharge** to **waters of the U.S.**? (FORM 2A)		X	
C. Is this a facility which currently results in **discharges** to **waters of the U.S.** other than those described in A or B above? (FORM 2C)		X	
E. Does or will this facility treat, store, or dispose of **hazardous wastes**? (FORM 3)	X		X
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		X	
I. Is this facility a proposed **stationary source** which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an **attainment area**? (FORM 5)		X	

SPECIFIC QUESTIONS	MARK 'X' YES	NO	FORM ATTACHED
B. Does or will this facility *(either existing or proposed)* include a **concentrated animal feeding operation** or **aquatic animal production facility** which results in a **discharge** to **waters of the U.S.**? (FORM 2B)		X	
D. Is this a proposed facility *(other than those described in A or B above)* which will result in a **discharge** to **waters of the U.S.**? (FORM 2D)		X	
F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)		X	
H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)		X	
J. Is this facility a proposed **stationary source** which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an **attainment area**? (FORM 5)		X	

III. NAME OF FACILITY

1 SKIP: KOPPERS COMPANY INC

IV. FACILITY CONTACT

A. NAME & TITLE *(last, first, & title)*	B. PHONE *(area code & no.)*
2 BARTLOW RAYMOND PLANT MANAGER	601 226 4584

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX			
3 BOX 160			
B. CITY OR TOWN	**C. STATE**	**D. ZIP CODE**	
4 TIE PLANT	MA	38960	

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER			
5 NOT APPLICABLE			
B. COUNTY NAME			
GRENADA			
C. CITY OR TOWN	**D. STATE**	**E. ZIP CODE**	**F. COUNTY CODE (if known)**
6 TIE PLANT	MS	38960	

CONTINUED FROM THE FRONT

VII. SIC CODES (4-digit, in order of priority)

A. FIRST	B. SECOND
2491 (specify) WOOD PRESERVING	(specify) NOT APPLICABLE
C. THIRD	**D. FOURTH**
(specify) NOT APPLICABLE	(specify) NOT APPLICABLE

VIII. OPERATOR INFORMATION

A. NAME

KOPPERS COMPANY INC

B. Is the name listed in Item VIII-A also the owner? ☒ YES ☐ NO

C. STATUS OF OPERATOR (Enter the appropriate letter into the answer box; if "Other", specify.)

F = FEDERAL; M = PUBLIC (other than federal or state); S = STATE; O = OTHER (specify); P = PRIVATE

P (specify)

D. PHONE (area code & no.) A 412 227 2000

E. STREET OR P.O. BOX

KOPPERS BUILDING

F. CITY OR TOWN

B PITTSBURGH

G. STATE PA

H. ZIP CODE 15219

IX. INDIAN LAND

Is the facility located on Indian lands? ☐ YES ☒ NO

X. EXISTING ENVIRONMENTAL PERMITS

A. NPDES (Discharges to Surface Water) 9 N N/A	**D. PSD** (Air Emissions from Proposed Sources) 9 P N/A
B. UIC (Underground Injection of Fluids) 9 U N/A	**E. OTHER** (specify) 9 76-024 STATE (specify) Effluent Zero Discharge
C. RCRA (Hazardous Wastes) 9 R N/A	**E. OTHER** (specify) 9 N/A (specify)

XI. MAP

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

XII. NATURE OF BUSINESS (provide a brief description)

The plant deals with the preservation of wood products utilizing pressure treatment process. The preservation process utilizes petroleum and coal tar base products.

XIII. CERTIFICATION (see instructions)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE (type or print)	B. SIGNATURE	C. DATE SIGNED
Robert K. Wagner - Vice President & General Mgr., Treated Wood Products Div.		10-14-80

COMMENTS FOR OFFICIAL USE ONLY

Please print or type in the unshaded areas only
(fill—in areas are spaced for elite type, i.e., 12 characters/inch).

FORM 3 RCRA

U.S. ENVIRONMENTAL PROTECTION AGENCY

HAZARDOUS WASTE PERMIT APPLICATION

Consolidated Permits Program

(This information is required under Section 3005 of RCRA.)

Form Approved OMB No. 158-S80004

I. EPA I.D. NUMBER

S F

FOR OFFICIAL USE ONLY

APPLICATION APPROVED	DATE RECEIVED (yr., mo., & day)	COMMENTS

II. FIRST OR REVISED APPLICATION

Place an "X" in the appropriate box in A or B below *(mark one box only)* to indicate whether this is the first application you are submitting for your facility or a revised application. If this is your first application and you already know your facility's EPA I.D. Number, or if this is a revised application, enter your facility's EPA I.D. Number in Item I above.

A. FIRST APPLICATION *(place an "X" below and provide the appropriate date)*

[X] 1. EXISTING FACILITY *(See instructions for definition of "existing" facility. Complete item below.)*

FOR EXISTING FACILITIES, PROVIDE THE DATE (yr., mo., & day) OPERATION BEGAN OR THE DATE CONSTRUCTION COMMENCED *(use the boxes to the left)*

YR.	MO.	DAY
04		

[ ] 2. NEW FACILITY *(Complete item below.)*

FOR NEW FACILITIES, PROVIDE THE DATE (yr., mo., & day) OPERATION BEGAN OR IS EXPECTED TO BEGIN

YR.	MO.	DAY

B. REVISED APPLICATION *(place an "X" below and complete Item I above)*

[ ] 1. FACILITY HAS INTERIM STATUS

[ ] 2. FACILITY HAS A RCRA PERMIT

III. PROCESSES — CODES AND DESIGN CAPACITIES

A. PROCESS CODE — Enter the code from the list of process codes below that best describes each process to be used at the facility. Ten lines are provided for entering codes. If more lines are needed, enter the code(s) in the space provided. If a process will be used that is not included in the list of codes below, then describe the process *(including its design capacity)* in the space provided on the form *(Item III-C)*.

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

1. AMOUNT — Enter the amount.
2. UNIT OF MEASURE — For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the unit of measure used. Only the units of measure that are listed below should be used.

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Storage:		
CONTAINER *(barrel, drum, etc.)*	S01	GALLONS OR LITERS
TANK	S02	GALLONS OR LITERS
WASTE PILE	S03	CUBIC YARDS OR CUBIC METERS
SURFACE IMPOUNDMENT	S04	GALLONS OR LITERS
Disposal:		
INJECTION WELL	D79	GALLONS OR LITERS
LANDFILL	D80	ACRE-FEET *(the volume that would cover one acre to a depth of one foot)* OR HECTARE-METER
LAND APPLICATION	D81	ACRES OR HECTARES
OCEAN DISPOSAL	D82	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	D83	GALLONS OR LITERS

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Treatment:		
TANK	T01	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	T02	GALLONS PER DAY OR LITERS PER DAY
INCINERATOR	T03	TONS PER HOUR OR METRIC TONS PER HOUR; GALLONS PER HOUR OR LITERS PER HOUR
OTHER *(Use for physical, chemical, thermal or biological treatment processes not occurring in tanks, surface impoundments or incinerators. Describe the processes in the space provided; Item III-C.)*	T04	GALLONS PER DAY OR LITERS PER DAY

UNIT OF MEASURE	UNIT OF MEASURE CODE
GALLONS	G
LITERS	L
CUBIC YARDS	Y
CUBIC METERS	C
GALLONS PER DAY	U

UNIT OF MEASURE	UNIT OF MEASURE CODE
LITERS PER DAY	V
TONS PER HOUR	D
METRIC TONS PER HOUR	W
GALLONS PER HOUR	E
LITERS PER HOUR	H

UNIT OF MEASURE	UNIT OF MEASURE CODE
ACRE-FEET	A
HECTARE-METER	F
ACRES	B
HECTARES	Q

EXAMPLE FOR COMPLETING ITEM III *(shown in line numbers X-1 and X-2 below)*: A facility has two storage tanks, one tank can hold 200 gallons and the other can hold 400 gallons. The facility also has an incinerator that can burn up to 20 gallons per hour.

S C DUP T/A C 1

LINE NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT (specify)	B. PROCESS DESIGN CAPACITY 2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY	LINE NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT	B. PROCESS DESIGN CAPACITY 2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY
X-1	S02	600	G		5				
X-2	T03	20	E		6				
1	S01	5000	G		7				
2	S04	5000	G		8				
3					9				
4					10				

Continued from the front.

III. PROCESSES *(continued)*

C. SPACE FOR ADDITIONAL PROCESS CODES OR FOR DESCRIBING OTHER PROCESSES *(code "T04")*. FOR EACH PROCESS ENTERED HERE INCLUDE DESIGN CAPACITY.

NOT APPLICABLE

IV. DESCRIPTION OF HAZARDOUS WASTES

A. **EPA HAZARDOUS WASTE NUMBER** — Enter the four–digit number from 40 CFR, Subpart D for each listed hazardous waste you will handle. If you handle hazardous wastes which are not listed in 40 CFR, Subpart D, enter the four–digit number*(s)* from 40 CFR, Subpart C that describes the characteristics and/or the toxic contaminants of those hazardous wastes.

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

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

ENGLISH UNIT OF MEASURE	CODE
POUNDS	P
TONS	T

METRIC UNIT OF MEASURE	CODE
KILOGRAMS	K
METRIC TONS	M

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

D. **PROCESSES**

1. PROCESS CODES:
   For listed hazardous waste: For each **listed** hazardous waste entered in column A select the code*(s)* from the list of process codes contained in Item III to indicate how the waste will be stored, treated, and/or disposed of at the facility.
   For non–listed hazardous wastes: For each characteristic or toxic contaminant entered in column A, select the code*(s)* from the list of process codes contained in Item III to indicate **all** the processes that will be used to store, treat, and/or dispose of all the non–listed hazardous wastes that possess that characteristic or toxic contaminant.
   Note: Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter "000" in the extreme right box of Item IV-D(1); and (3) Enter in the space provided on page 4, the line number and the additional code*(s)*.

2. PROCESS DESCRIPTION: If a code is not listed for a process that will be used, describe the process in the space provided on the form.

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

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

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

LINE NO.	A. EPA HAZARD. WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	D. PROCESSES 2. PROCESS DESCRIPTION (if a code is not entered in D(1))
X-1	K 0 5 4	900	P	T 0 3 D 8 0	
X-2	D 0 0 2	400	P	T 0 3 D 8 0	
X-3	D 0 0 1	100	P	T 0 3 D 8 0	
X-4	D 0 0 2				included with above

Continued from page 2.
NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

Form Approved OMB No. 158-S80004

EPA I.D. NUMBER (enter from page 1): W

FOR OFFICIAL USE ONLY: W DUP (T/A: 2) DUP

IV. DESCRIPTION OF HAZARDOUS WASTES (continued)

LINE NO.	A. EPA HAZARD. WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	D. PROCESSES 2. PROCESS DESCRIPTION (if a code is not entered in D(1))
1	K001	2500	P	S01	
2	P090	1000	P	S01	
3	U051	1000	P	S01	
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					

CONTINUE ON REVERSE

Continued from the front.

IV. DESCRIPTION OF HAZARDOUS WASTE (continued)

E. USE THIS SPACE TO LIST ADDITIONAL PROCESS CODES FROM ITEM D(1) ON PAGE 3.

NOT APPLICABLE

EPA I.D. NO. (enter from page 1)

S		T/A	C
F			6

V. FACILITY DRAWING

All existing facilities must include in the space provided on page 5 a scale drawing of the facility *(see instructions for more detail).*

VI. PHOTOGRAPHS

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

VII. FACILITY GEOGRAPHIC LOCATION

LATITUDE (degrees, minutes, & seconds)	LONGITUDE (degrees, minutes, & seconds)
33 44 04	89 47 19

VIII. FACILITY OWNER

[X] A. If the facility owner is also the facility operator as listed in Section VIII on Form 1, "General Information", place an "X" in the box to the left and skip to Section IX below.

B. If the facility owner is not the facility operator as listed in Section VIII on Form 1, complete the following items:

C	1. NAME OF FACILITY'S LEGAL OWNER	2. PHONE NO. (area code & no.)
E	NOT APPLICABLE	

C	3. STREET OR P.O. BOX	C	4. CITY OR TOWN	5. ST.	6. ZIP CODE
F		G			

IX. OWNER CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME (print or type)	B. SIGNATURE	C. DATE SIGNED
Robert K. Wagner Vice President & General Mgr. Treated Wood Products Div.	[signature]	10-14-80

X. OPERATOR CERTIFICATION

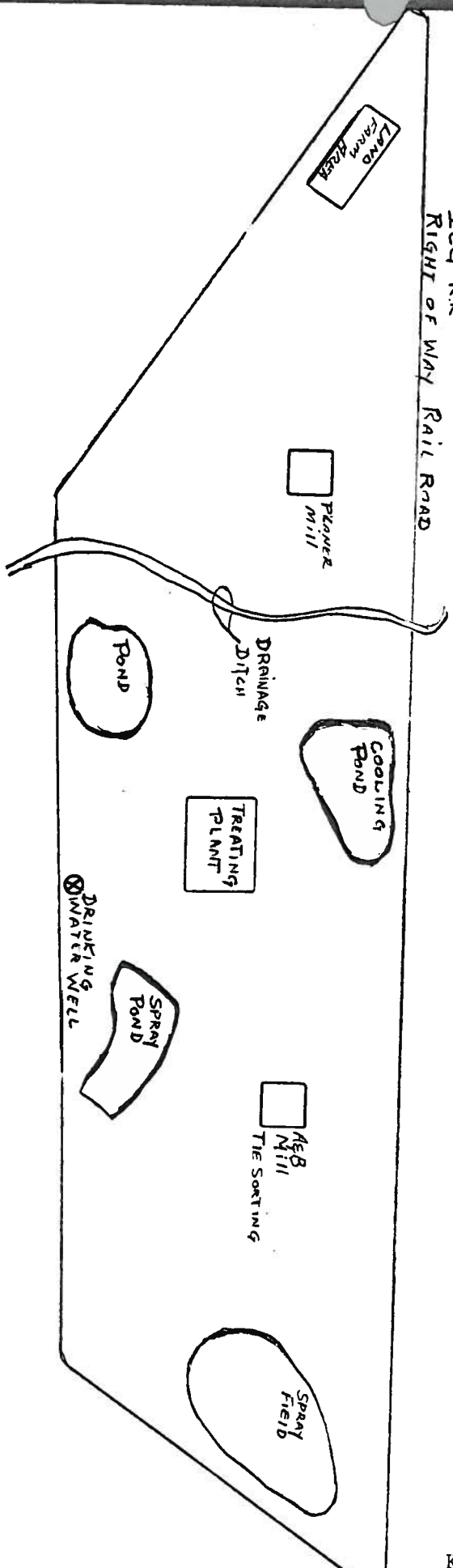
I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME (print or type)	B. SIGNATURE	C. DATE SIGNED

Continued from page 4.

V. FACILITY DRAWING *(see page 4)*

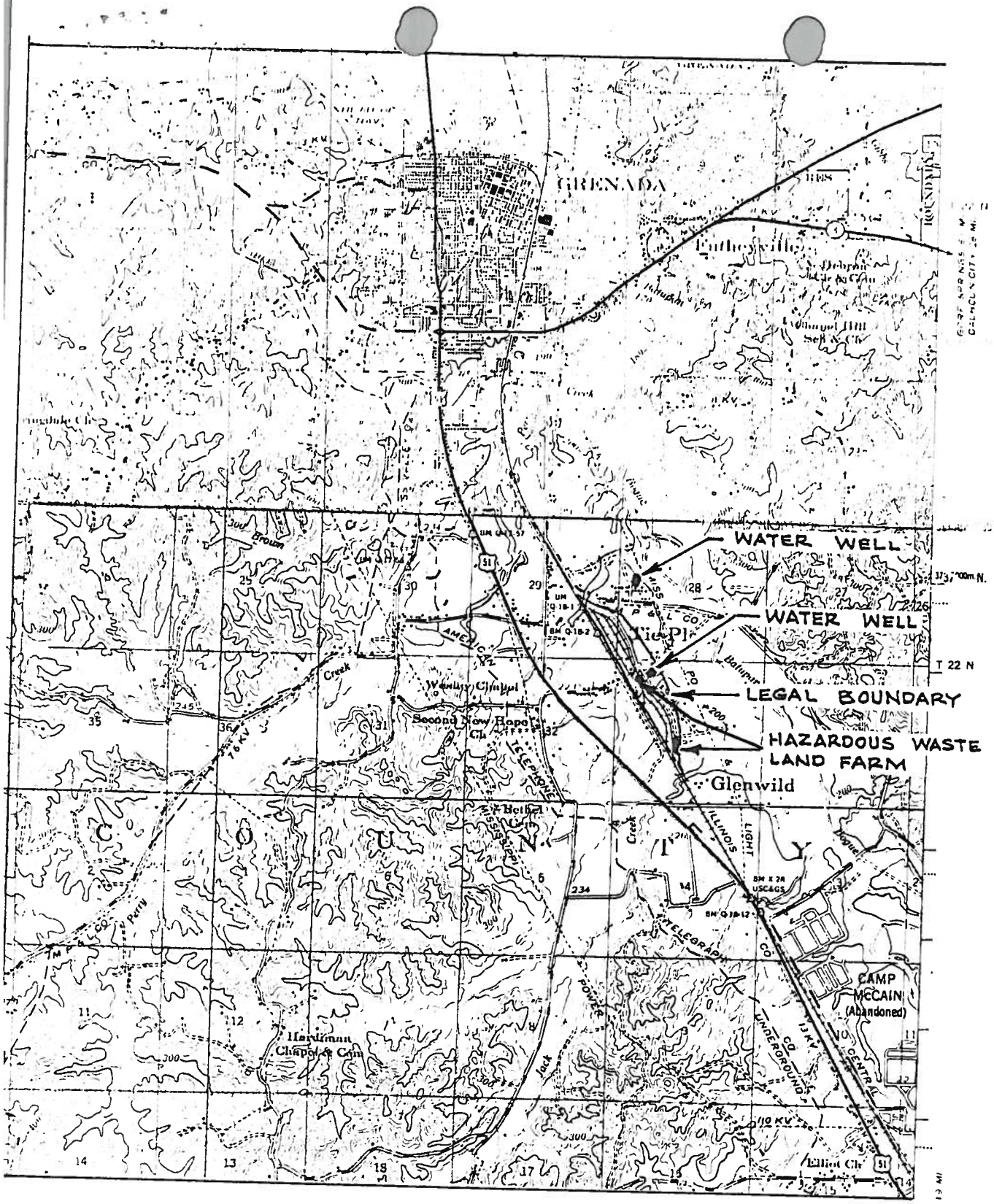
Form Approved OMB No. 158-S80004



SCALE: 1 INCH = APPROX 1200'

HNV 10-10-80

Koppers Company, Inc.
Grenada, Mississippi



USGS MAP
McCARLEY, MISS.

LOCATION MAP
KOPPERS CO., INC.
GRENADA, MISS.

Please print or type in the unshaded areas only (fill–in areas are spaced for elite type, i.e., 12 characters/inch).

Form Approved OMB No. 158-R0175

FORM 1 GENERAL

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERAL INFORMATION

Consolidated Permits Program

(Read the "General Instructions" before starting.)

I. EPA I.D. NUMBER

F | MSD007027543 | D

LABEL ITEMS

I. EPA I.D. NUMBER

III. FACILITY NAME

V. FACILITY MAILING ADDRESS

VI. FACILITY LOCATION

PLEASE PLACE LABEL IN THIS SPACE

GENERAL INSTRUCTIONS

If a preprinted label has been provided, affix it in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill–in area below. Also, if any of the preprinted data is absent *(the area to the left of the label space lists the information that should appear)*, please provide it in the proper fill–in area(s) below. If the label is complete and correct, you need not complete Items I, III, V, and VI *(except VI-B which must be completed regardless)*. Complete all items if no label has been provided. Refer to the instructions for detailed item descriptions and for the legal authorizations under which this data is collected.

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of bold–faced terms.

SPECIFIC QUESTIONS	YES	NO	FORM ATTACHED	SPECIFIC QUESTIONS	YES	NO	FORM ATTACHED
A. Is this facility a publicly owned treatment works which results in a discharge to waters of the U.S.? (FORM 2A)		X		B. Does or will this facility *(either existing or proposed)* include a concentrated animal feeding operation or aquatic animal production facility which results in a discharge to waters of the U.S.? (FORM 2B)		X	
C. Is this a facility which currently results in discharges to waters of the U.S. other than those described in A or B above? (FORM 2C)		X		D. Is this a proposed facility *(other than those described in A or B above)* which will result in a discharge to waters of the U.S.? (FORM 2D)		X	
E. Does or will this facility treat, store, or dispose of hazardous wastes? (FORM 3)	X		X	F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)		X	
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		X		H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)		X	
I. Is this facility a proposed stationary source which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X		J. Is this facility a proposed stationary source which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X	

III. NAME OF FACILITY

1 SKIP KOPPERS COMPANY INC

IV. FACILITY CONTACT

A. NAME & TITLE (last, first, & title)	B. PHONE (area code & no.)
2 BARTLOW RAYMOND PLANT MANAGER	601 226 4584

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX

3 BOX 160

B. CITY OR TOWN	C. STATE	D. ZIP CODE
4 TIE PLANT	MS	38960

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER

5 NOT APPLICABLE

B. COUNTY NAME

GRENADA

C. CITY OR TOWN	D. STATE	E. ZIP CODE	F. COUNTY CODE (if known)
6 TIE PLANT	MS	38960	

CONTINUED FROM THE FRONT

VII. SIC CODES (4-digit, in order of priority)

A. FIRST	B. SECOND
2491 (specify) WOOD PRESERVING	(specify) NOT APPLICABLE
C. THIRD	**D. FOURTH**
(specify) NOT APPLICABLE	(specify) NOT APPLICABLE

VIII. OPERATOR INFORMATION

A. NAME: KOPPERS COMPANY INC

B. Is the name listed in Item VIII-A also the owner? ☒ YES ☐ NO

C. STATUS OF OPERATOR (Enter the appropriate letter into the answer box; if "Other", specify.)
F = FEDERAL; S = STATE; P = PRIVATE; M = PUBLIC (other than federal or state); O = OTHER (specify)
P (specify)

D. PHONE (area code & no.): A 412 227 2000

E. STREET (OR P.O. BOX): KOPPERS BUILDING

F. CITY OR TOWN: PITTSBURGH

G. STATE: PA

H. ZIP CODE: 15219

IX. INDIAN LAND

Is the facility located on Indian lands? ☐ YES ☒ NO

X. EXISTING ENVIRONMENTAL PERMITS

A. NPDES (Discharges to Surface Water): N N/A	D. PSD (Air Emissions from Proposed Sources): P N/A
B. UIC (Underground Injection of Fluids): U N/A	E. OTHER (specify): 9 76-024 STATE (specify) Effluent Zero Discharge
C. RCRA (Hazardous Wastes): R N/A	F. OTHER (specify): 9 N/A (specify)

XI. MAP

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

XII. NATURE OF BUSINESS (provide a brief description)

The plant deals with the preservation of wood products utilizing pressure treatment process. The preservation process utilizes petroleum and coal tar base products.

XIII. CERTIFICATION (see instructions)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE (type or print)	B. SIGNATURE	C. DATE SIGNED
Robert K. Wagner - Vice President & General Mgr., Treated Wood Products Div.		10-14-80

COMMENTS FOR OFFICIAL USE ONLY

C

Please print or type in the unshaded areas only
(fill—in areas are spaced for elite type, i.e., 12 characters/inch).

Form Approved OMB No. 158-S80004

FORM 3 RCRA

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

HAZARDOUS WASTE PERMIT APPLICATION

Consolidated Permits Program

(This information is required under Section 3005 of RCRA.)

I. EPA I.D. NUMBER

F M S D 0 0 7 0 2 7 5 4 3

FOR OFFICIAL USE ONLY

APPLICATION APPROVED	DATE RECEIVED (yr., mo., & day)	COMMENTS

II. FIRST OR REVISED APPLICATION

Place an "X" in the appropriate box in A or B below *(mark one box only)* to indicate whether this is the first application you are submitting for your facility o revised application. If this is your first application and you already know your facility's EPA I.D. Number, or if this is a revised application, enter your facility EPA I.D. Number in Item I above.

A. FIRST APPLICATION *(place an "X" below and provide the appropriate date)*

[X] 1. EXISTING FACILITY *(See instructions for definition of "existing" facility. Complete item below.)*

FOR EXISTING FACILITIES, PROVIDE THE DATE (yr., mo., & day) OPERATION BEGAN OR THE DATE CONSTRUCTION COMMENCED *(use the boxes to the left)*

YR.	MO.	DAY
0 4	0 1	C L

[ ] 2. NEW FACILITY *(Complete item below.)*

FOR NEW FACILITI PROVIDE THE DAT (yr., mo., & day) OPE TION BEGAN OR IS EXPECTED TO BEG

YR.	MO.	DAY

B. REVISED APPLICATION *(place an "X" below and complete Item I above)*

[ ] 1. FACILITY HAS INTERIM STATUS

[ ] 2. FACILITY HAS A RCRA PERMIT

III. PROCESSES — CODES AND DESIGN CAPACITIES

A. PROCESS CODE — Enter the code from the list of process codes below that best describes each process to be used at the facility. Ten lines are provided for entering codes. If more lines are needed, enter the code(s) in the space provided. If a process will be used that is not included in the list of codes below, the describe the process *(including its design capacity)* in the space provided on the form *(Item III-C)*.

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

1. AMOUNT — Enter the amount.
2. UNIT OF MEASURE — For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the unit of measure used. Only the units of measure that are listed below should be used.

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Storage:		
CONTAINER *(barrel, drum, etc.)*	S01	GALLONS OR LITERS
TANK	S02	GALLONS OR LITERS
WASTE PILE	S03	CUBIC YARDS OR CUBIC METERS
SURFACE IMPOUNDMENT	S04	GALLONS OR LITERS
Disposal:		
INJECTION WELL	D79	GALLONS OR LITERS
LANDFILL	D80	ACRE-FEET *(the volume that would cover one acre to a depth of one foot)* OR HECTARE-METER
LAND APPLICATION	D81	ACRES OR HECTARES
OCEAN DISPOSAL	D82	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	D83	GALLONS OR LITERS

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Treatment:		
TANK	T01	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	T02	GALLONS PER DAY OR LITERS PER DAY
INCINERATOR	T03	TONS PER HOUR OR METRIC TONS PER HOUR OR GALLONS PER HOUR OR LITERS PER HOUR
OTHER *(Use for physical, chemical, thermal or biological treatment processes not occurring in tanks, surface impoundments or incinerators. Describe the processes in the space provided; Item III-C.)*	T04	GALLONS PER DAY OR LITERS PER DAY

UNIT OF MEASURE	UNIT OF MEASURE CODE
GALLONS	G
LITERS	L
CUBIC YARDS	Y
CUBIC METERS	C
GALLONS PER DAY	U

UNIT OF MEASURE	UNIT OF MEASURE CODE
LITERS PER DAY	V
TONS PER HOUR	D
METRIC TONS PER HOUR	W
GALLONS PER HOUR	E
LITERS PER HOUR	H

UNIT OF MEASURE	UNIT OF MEASURE CODE
ACRE-FEET	A
HECTARE-METER	F
ACRES	B
HECTARES	Q

EXAMPLE FOR COMPLETING ITEM III *(shown in line numbers X-1 and X-2 below)*: A facility has two storage tanks, one tank can hold 200 gallons and the other can hold 400 gallons. The facility also has an incinerator that can burn up to 20 gallons per hour.

C DUP T/A C 1

LINE NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT (specify)	B. PROCESS DESIGN CAPACITY 2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY
X-1	S 0 2	600	G	
X-2	T 0 3	20	E	
1	S 0 1	5000	G	
2	S 0 4	38000	G	
3				
4				
5				
6				
7				
8				
9				
10				

Continued from the front.

III. PROCESSES *(continued)*

C. SPACE FOR ADDITIONAL PROCESS CODES OR FOR DESCRIBING OTHER PROCESSES *(code "T04")*. FOR EACH PROCESS ENTERED HERE INCLUDE DESIGN CAPACITY.

NOT APPLICABLE

IV. DESCRIPTION OF HAZARDOUS WASTES

A. EPA HAZARDOUS WASTE NUMBER — Enter the four—digit number from 40 CFR, Subpart D for each listed hazardous waste you will handle. If you handle hazardous wastes which are not listed in 40 CFR, Subpart D, enter the four—digit number*(s)* from 40 CFR, Subpart C that describes the characteristics and/or the toxic contaminants of those hazardous wastes.

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

C. UNIT OF MEASURE — For each quantity entered in column B enter the unit of measure code. Units of measure which must be used and the appropriate codes are:

ENGLISH UNIT OF MEASURE	CODE
POUNDS	P
TONS	T

METRIC UNIT OF MEASURE	CODE
KILOGRAMS	K
METRIC TONS	M

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

D. PROCESSES

1. PROCESS CODES:
   For listed hazardous waste: For each listed hazardous waste entered in column A select the code*(s)* from the list of process codes contained in Item III to indicate how the waste will be stored, treated, and/or disposed of at the facility.
   For non—listed hazardous wastes: For each characteristic or toxic contaminant entered in column A, select the code*(s)* from the list of process codes contained in Item III to indicate all the processes that will be used to store, treat, and/or dispose of all the non—listed hazardous wastes that possess that characteristic or toxic contaminant.
   Note: Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter "000" in the extreme right box of Item IV-D(1); and (3) Enter in the space provided on page 4, the line number and the additional code*(s)*.

2. PROCESS DESCRIPTION: If a code is not listed for a process that will be used, describe the process in the space provided on the form.

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

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

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

LINE NO.	A. EPA HAZARD. WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	D. PROCESSES 2. PROCESS DESCRIPTION (If a code is not entered in D(1))
X-1	K 0 5 4	900	P	T 0 3 D 8 0	
X-2	D 0 0 2	400	P	T 0 3 D 8 0	
X-3	D 0 0 1	100	P	T 0 3 D 8 0	
X-4	D 0 0 2				included with above

CONTINUE ON PAGE 3

Continued from page 2.
NOTE: Photocopy this page before completing if [illegible]ave more than 26 wastes to list.

Form Approved OMB No. 158-S80004

EPA I.D. NUMBER (enter from page 1)	T/A	C	FOR OFFICIAL USE ONLY	T/A	C	
W MSD007027543	3	1	W DUP		2	DUP

IV. DESCRIPTION OF HAZARDOUS WASTES *(continued)*

LINE NO.	A. EPA HAZARD. WASTE NO. *(enter code)*	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE *(enter code)*	D. PROCESSES 1. PROCESS CODES *(enter)*				D. PROCESSES 2. PROCESS DESCRIPTION *(if a code is not entered in D(1))*
1	K001	2500	P	S04				
2	P090	1000	P	S01				
3	U051	1000	P	S01				
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								

Continued from the front.

V. DESCRIPTION OF HAZARDOUS WAST *(continued)*

E. USE THIS SPACE TO LIST ADDITIONAL PROCESS CODES FROM ITEM D(1) ON PAGE

NOT APPLICABLE

EPA I.D. NO. *(enter from page 1)*

F MSD007027543 T/A 36

V. FACILITY DRAWING

All existing facilities must include in the space provided on page 5 a scale drawing of the facility *(see instructions for more detail).*

VI. PHOTOGRAPHS

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

VII. FACILITY GEOGRAPHIC LOCATION

LATITUDE *(degrees, minutes, & seconds)*	LONGITUDE *(degrees, minutes, & seconds)*
33 44 — 04 0 —	0 89 47 — 19 0 —

VIII. FACILITY OWNER

☒ A. If the facility owner is also the facility operator as listed in Section VIII on Form 1, "General Information", place an "X" in the box to the left and skip to Section IX below.

B. If the facility owner is not the facility operator as listed in Section VIII on Form 1, complete the following items:

1. NAME OF FACILITY'S LEGAL OWNER	2. PHONE NO. *(area code & no.)*
E NOT APPLICABLE	

3. STREET OR P.O. BOX	4. CITY OR TOWN	5. ST.	6. ZIP CODE
F	G		

IX. OWNER CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME *(print or type)*	B. SIGNATURE	C. DATE SIGNED
Robert K. Wagner Vice President & General Mgr. Treated Wood Products Div.		10-14-80

X. OPERATOR CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME *(print or type)*	B. SIGNATURE	C. DATE SIGNED

CONTINUE ON PAGE 5

FILE COPY

October 10, 1984

Mr. Charles Brush
Koppers Company, Inc.
Environmental Resources Department
Pittsburgh, Pennsylvania 15219

Dear Mr. Brush:

Re: Operations in Grenada County,
Mississippi

At its regular meeting held on October 10, 1984, the Mississippi Commission on Natural Resources convened a hearing in the matter of Koppers Company, Inc., Grenada County, Mississippi. As a result of the Commission's consideration of the matter, the enclosed Order was issued. As you can see from the Order, Koppers Company, Inc., was penalized a total of ten thousand dollars ($10,000), two thousand dollars ($2,000) of which is payable upon receipt of a copy of this Order, and eight thousand dollars ($8,000) of which is held in abeyance pending Koppers Company's compliance with the other requirements of the Order.

If you have any questions regarding the responsibilities of Koppers Company, Inc., in complying with the enclosed Order, please do not hesitate to contact us. As you know, appeals can be taken in accordance with the law.

Very truly yours,

Charlie L. Blalock
Executive Director

CLB:JWH:hdb
Attachment
cc: Honorable Templeton Smith, Attorney at Law (w/attachment)

BEFORE THE MISSISSIPPI COMMISSION ON NATURAL RESOURCES
BUREAU OF POLLUTION CONTROL

IN THE MATTER OF:

MISSISSIPPI COMMISSION ON
NATURAL RESOURCES

COMPLAINANT

VS.

KOPPERS COMPANY, INC. ORDER NO. 772 84

RESPONDENT

ORDER

The above styled cause came on this date for hearing and the Commission, having heard and considered the same, finds as follows:

1.

On September 25, 1984, a written complaint was filed against Koppers Company, Inc., stating that Koppers Company, Inc., had failed to submit a complete Part B permit application in accordance with the Mississippi Hazardous Waste Management Regulations and as required by an order of this Commission entered on May 9,1984, and amended on August 8, 1984. The complaint was filed when Koppers Company, Inc., failed to submit the Part B application for its Grenada County, Mississippi facility by September 12, 1984, as required by the Commission's Order No. 705-84.

2.

Koppers Company, Inc., did enter a plea of nolo contendere to the charges made against it in the above referenced complaint which plea is hereby accepted.

Premises considered, the Commission hereby assesses a monetary penalty of ten thousand dollars ($10,000.00) against Koppers Company, Inc., for the aforementioned acts.

IT IS FURTHER ORDERED AND ADJUDGED that only two thousand dollars ($2,000.00) of the penalty hereinabove levied be immediately imposed upon Respondent, and that the imposition of the remaining eight thousand dollars ($8,000.00) be held in abeyance pending the performance of Kopper's Company Inc., in complying with the following requirements:

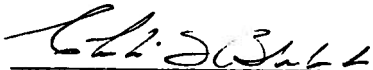
1. On or before January 31, 1985, Koppers Company, Inc., shall submit to the Bureau of Pollution Control a complete Part B application in accordance with the Mississippi Hazardous Waste Management Regulations for the Grenada, Mississippi facility.

2. On or before November 13, 1984, Respondent shall submit a status report to the Bureau of Pollution Control concerning its efforts to comply with requirement (1) above.

3. On or before December 18, 1984, Respondent shall submit a status report to the Bureau of Pollution Control concerning its efforts to comply with requirement (1) above.

ORDERED AND ADJUDGED, this the 10th day of October, 1984, by the Mississippi Commission on Natural Resources.

MISSISSIPPI DEPARTMENT OF
NATURAL RESOURCES

BY: 

CHARLIE L. BLALOCK
EXECUTIVE DIRECTOR

P 669 602 397

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL

(See Reverse)

Sent to Mr Charles E Brush	
Street and No. Env. Resources Dep	
P.O., State and ZIP Code Pittsburgh, Pen 15212	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to whom and Date Delivered	
Return receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	$
Postmark or Date	

PS Form 3800, Feb. 1982

★ U.S.G.P.O. 1983-403-517

MI DEPARTMENT OF NATURAL RESOURCES
Bureau of Pollution Control
P. O. Box 10385
Jackson, Mississippi 39209
(601) 961-5171

August 13, 1984

COPY

RECEIPT REQUESTED

.E.

Department
a 15212

ednesday, August 8, 1984, the Mississippi Commission
sidered certain evidence regarding your facility
located in Tie Plant, Mississippi. Enclosed is an amendment to Order No. 705-84, which has been issued as a result of that consideration.

Your cooperation in carrying out the provisions of the enclosed order is encouraged. As you know, appeals can be taken in accordance with the law.

If you have any questions, please do not hesitate to contact us.

Sincerely,

Charlie L. Blalock
Exective Director

CLB:CHC:vr

Enclosure

cc: Mr. Ray Bartlow, Plant Manager, Tie Plant, MS - (w/enclosure)

BEFORE THE MISSISSIPPI COMMISSION ON NATURAL RESOURCES
BUREAU OF POLLUTION CONTROL

IN THE MATTER OF:

MISSISSIPPI COMMISSION ON
NATURAL RESOURCES

COMPLAINANT

VS.

KOPPERS COMPANY, INC.

RESPONDENT

AMENDMENT TO
ORDER NO. 705 84

AMENDMENT

The above styled cause came on this date for consideration and the Commission having been presented with new and valid evidence regarding the schedule of compliance is of the opinion that the requirements outlined in Commission Order No. 705-84 issued on the 9th day of May, 1984, should be amended.

IT IS, THEREFORE, ORDERED that the requirements in Paragraph 7, Subparagraphs (1) and (2) of Commission Order No. 705-84 be deleted and that the Respondent, Koppers Company, Inc., shall comply with the following schedule instead:

1. Submit to the Bureau of Pollution Control by September 12, 1984, a complete permit application which includes the information requested by the Bureau in the letters of March 19, 1984, July 5, 1984 and July 19, 1984.

2. Koppers shall implement the groundwater assessment plan, submitted on July 16, 1984, as amended by the Bureau in the letter of August 2, 1984, on the schedule contained within the assessment plan. As a minimum this assessment plan requires:

   a. The installation of a new upgradient which monitors the uppermost aquifer and is unaffected by past practices at the site.

   b. The installation of three downgradient wells at the compliance point, which monitor the uppermost aquifer.

c. The above wells to be installed by August 15, 1984.

d. Groundwater monitoring of the new wells to commence on or about August 29, 1984, and to be followed on a bimonthly schedule, to include those parameters identified in the assessment plan and the Bureau's letter of August 2, 1984.

3. By September 13, 1984, Koppers shall submit a report from a certified hydrogeologist that the above required wells were installed and sampled within the time constraints above and are technically adequate to monitor the uppermost aquifer.

IT IS FURTHER ORDERED AND ADJUDGED that this amendment be attached to Commission Order No. 705-84 and become a part thereof and shall become final thirty (30) days after the date of rendition hereof, unless the Respondent, before the said thirty (30) days have elapsed, files a sworn petition with this Commission as provided by Section 49-17-41, Mississippi Code Annotated (1972) setting forth the grounds and reasons for said complaint and asking for a hearing thereon.

ORDERED AND ADJUDGED, this the 8th day of August, 1984, by the Mississippi Commission on Natural Resources.

MISSISSIPPI DEPARTMENT OF
NATURAL RESOURCES

BY: Charlie L. Blalock
CHARLIE L. BLALOCK
EXECUTIVE DIRECTOR

MISSISSIPPI DEPARTMENT OF NATURAL RESOURCES
Bureau of Pollution Control
P. O. Box 10385
Jackson, Mississippi 39209
(601) 961-5171

FILE COPY

August 13, 1984

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Charles E. Brush, P.E.
Koppers Company, Inc.
Environmental Resources Department
Pittsburgh, Pennsylvania 15212

Dear Mr. Brush:

At its meeting held on Wednesday, August 8, 1984, the Mississippi Commission on Natural Resources considered certain evidence regarding your facility located in Tie Plant, Mississippi. Enclosed is an amendment to Order No. 705-84, which has been issued as a result of that consideration.

Your cooperation in carrying out the provisions of the enclosed order is encouraged. As you know, appeals can be taken in accordance with the law.

If you have any questions, please do not hesitate to contact us.

Sincerely,

Charlie L. Blalock
Exective Director

CLB:CHC:vr

Enclosure

cc: Mr. Ray Bartlow, Plant Manager, Tie Plant, MS - (w/enclosure)

BEFORE THE MISSISSIPPI COMMISSION ON NATURAL RESOURCES
BUREAU OF POLLUTION CONTROL

IN THE MATTER OF:

MISSISSIPPI COMMISSION ON
NATURAL RESOURCES

COMPLAINANT

VS.

KOPPERS COMPANY, INC.

RESPONDENT

AMENDMENT TO
ORDER NO. 705 84

AMENDMENT

The above styled cause came on this date for consideration and the Commission having been presented with new and valid evidence regarding the schedule of compliance is of the opinion that the requirements outlined in Commission Order No. 705-84 issued on the 9th day of May, 1984, should be amended.

IT IS, THEREFORE, ORDERED that the requirements in Paragraph 7, Subparagraphs (1) and (2) of Commission Order No. 705-84 be deleted and that the Respondent, Koppers Company, Inc., shall comply with the following schedule instead:

1. Submit to the Bureau of Pollution Control by September 12, 1984, a complete permit application which includes the information requested by the Bureau in the letters of March 19, 1984, July 5, 1984 and July 19, 1984.

2. Koppers shall implement the groundwater assessment plan, submitted on July 16, 1984, as amended by the Bureau in the letter of August 2, 1984, on the schedule contained within the assessment plan. As a minimum this assessment plan requires:

   a. The installation of a new upgradient which monitors the uppermost aquifer and is unaffected by past practices at the site.

   b. The installation of three downgradient wells at the compliance point, which monitor the uppermost aquifer.

PIERS CLOSURE PLAN

SECTION I

CLOSURE PLAN, POST CLOSURE PLAN

AND

FINANCIAL REQUIREMENTS

Revised 9/89

CLOSURE AND POST CLOSURE

Closure plans for both the container storage area and the surface impoundment have been developed and is attached along with a closure cost analysis. This plan was designed to prevent threats to human health and the environment. No post closure plans are required for this facility.

RCRA CLOSURE PLAN

for

Container Storage*

EPA FACILITY I.D. NO. MSD007027543

OWNER OR OPERATOR'S NAME Koppers Company, Inc.

ADDRESS & PHONE NO. P. O. Box 160

Tie Plant, Mississippi 38960

(601) 226-4584

FACILITY LOCATION Tie Plant, Mississippi

A. Currently, there is no expected date of closure for the plant's container storage facility. However, at which time Koppers Management decides that the container storage facility will cease operations it will be closed in accordance with this plan. Such actions will be completed within six months after receiving the final volume of hazardous waste.

1. Within 90 days after receiving the final volume of hazardous wastes, all containers will be manifested and transported to a permitted Treatment, Storage, and/or Disposal facility. At no point during the life of the facility will the quantity of waste stored exceed the design capacity reported to EPA on the plant's Part A application.

2. The storage area, including equipment and appurtenances, will be decontaminated and the contaminated material properly contained and disposed of at a permitted Treatment, Storage, and/or Disposal facility. Depending on site conditions, this decontamination could range from sweeping/rinsing to scraping/solvent washing.

B. General

1. This plan will be submitted to the Regional Administrator at least 180 days before the date closure is expected to begin.

2. A certificate of closure will be submitted to the Regional Administrator by the owner and/or operator, and by an independent registered professional engineer.

---

* The following material was used as a guideline in the preparation of this Closure Plan:

Draft Guidance for Subpart G of the Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities, EPA Contract No. 68-01-5794, IR&T Corporation, October 6, 1980.

CONTAINER STORAGE FACILITY
CLOSURE COSTS
KOPPERS COMPANY, INC.
TIE PLANT, MISSISSIPPI
EPA I.D. NO. D007027543

January, 1984

I. General

The container storage facility with a capacity of 192 - 55 gallon drums, will be closed in accordance with its Closure Plan found in its Part B Permit.

II. Cost

Chemical Waste Management Costs (1984)

192 Drums x $ 28.00 =		$ 5,376.
2 Truckloads @ $600. ea. =		1,200.
Alabama Disposal Tax $ 2.00 x 192 =		384.
Superfund Tax @ $2.13/ton x 38.4 = (400 lbs x 192 ÷ 2000 lbs = 38.4 tons)		82.
Sub-Total		$ 7,042.

Koppers Plant Labor Costs (1984)

25 hr. @ $8.50/hr. loading =		$ 212.00
20 hr. @ $8.50/hr. Cleanup =		170.00
Professional Engineer Certification =		500.00
Sub-Total		$ 882.00
TOTAL	=	$7,924.00

Supporting documentation:
Chemical Waste Management, Inc. estimates dated January 4, 1984.

Chemical Waste Management, Inc.
Emelle Facility
P.O. Box 55
Emelle, Alabama 35459
205/652-9531
Telex: 782252

January 4, 1984

Chuck Vita
KOPPERS COMPANY, INC.
1201 Koppers Building
Pittsburgh, PA 15219

Dear Chuck:

Submitted below are cost estimates for disposal and transportation of waste materials generated at Grenada, MS. These costs are current but may be subject to adjustment at a later date.

For disposal of drummed solids: $28.00 each

For transportation from Grenada, MS; $600.00 per load

State of Alabama Disposal Tax: $2.00 per 55-gallon drum

Federal Superfund Tax: $2.13 per dry weight ton

If you require any further assistance, please give me a call.

Sincerely,

Sara

Sara R. Walton
Technical Representative

SRW/jcn

RCRA CLOSURE PLAN
SURFACE IMPOUNDMENT
KOPPERS COMPANY, INC.
TIE PLANT, MISSISSIPPI
EPA I.D. NO. MSD007027543

OWNER: Koppers Company, Inc.

ADDRESS: P. O. Box 160
Tie Plant, MS. 38960

TELEPHONE: (601) 226-4584

ADDRESS: Tie Plant Road
Tie Plant, MS. 38960

GENERAL

In 1984 there is no specific date for the closure of the plant or its surface impoundment (SI). However, at such time as Koppers decides to close this hazardous waste facility, it shall be closed in accordance with this plan.

BACKGROUND

This surface impoundment (SI) was constructed in the 1970's as part of the plant's wastewater management program. No engineering drawings or records exist. Verbal history indicates it was excavated in natural clay, and the surface compacted. The SI is about 284' by 95' wide with a depth of about 10' below top of dikes. The embankments extend upward out of the ground as much as 6' and as little as 3.0 feet because of the local slope of land. The hydraulic volume of the SI is about 3/4 million gallons. Oily wood preserving sludges in the amount of 100 cubic yards are expected to collect on the bottom of this SI by closure time.

It is anticipated that the sludge and contaminated clay liner will be removed at closure.

METHOD OF CLOSURE

1. Allow water to stand for 30 days after last ineffluent is received. Add polymers to aid in settling any remaining oils. Bench jar tests may be required. Start with polymers used in the plants oil/water separator to break emulsions.

2. Decant water to spray irrigation field in accordance with its permitted application rate.

3. Allow sludge to stand for 30 days (summer conditions), removing rain water as necessary.

4. Use vacuum truck (min. 4" diameter suction) to remove oily sludge from bottom of SI. Mix wood waste (saw dust and wood chips as necessary) for handling ease.

5. Transport vacuum truck contents to boiler house full bunker for use of waste as fuel additive for the plants wood waste fired boiler.

6. Use backhoe and/or front-end loader to excavate contaminated clay liner. Sample for K-001 in accordance with the Waste Analysis Plan of the Part B Permit.

7. Load the transport contaminated clay in closed bottom, bulk trailer to a secure landfill. Cover, and manifest as applicable at the time.

8. Resample when completed for contamination.

9. Use uncontaminated earth from berms and off-site soil to backfill the SI. Cover with top soil, and seed with local grasses to establish cover. Slope to natural contours at site.

DECONTAMINATION

All workers shall observe the safety procedures outlined for handling hazardous waste as presented in the Part B Permit for this facility.

All equipment shall be decontaminated using fuel oil (No. 2 or better). Place equipment in shallow sump constructed on site and lined with plastic film. Use low pressure sprays to clean working surfaces and collect the flushing oil in the sump. Pump the collected oil in the sump to 55 gallon drums (approved in Part B Permit) and transport to the on-site fuel bunker for the waste-wood fired boiler which has oil as the start-up and back-up fuel.

At the close of the project, manifest plastic film, work clothes, gloves and rags of site for disposal as K-001 waste. Package in open head, approved 55 gallon drums.

GROUNDWATER MONITORING

Four monitoring wells are in place to observe the condition of groundwater. At the time this Plan was prepared, no adverse data had collected after several rounds of sampling. This sampling and monitoring effort will continue until the Professional Engineer certifying closure receives approval from the controlling agency.

DOCUMENTATION

1. This plan will be submitted to the State of Mississippi Environmental Agency at least 180 days before the date closure is expected to begin.

2. Tests on subsurface soil below the impoundment.

3. Certification of closure will be submitted to the State by the owner and registered professional engineer.

GUIDANCE

General guidance was obtained in preparing this plan from the US EPA, Office of Solid Waste, Document SW-873-Sept.1982, Closure of Hazardous Waste Surface Impoundments.

SURFACE IMPOUNDMENT
CLOSURE COSTS
KOPPERS COMPANY, INC.
TIE PLANT, MISSISSIPPI
EPA I.D. NO. MSD007027543

January, 1984

I. General

Estimates submitted in the Part B Permit Application estimate K-001 waste in the impoundment to equal 100 cu. yards (19,545 gallon/2,613 cu.ft) at closure.

II. Closure Cost

1. Dewatering with plant labor =	$ 250.
2. Vacuum Truck *removal of oily sludge from bottom of impoundment- 5 days @ $1000.00/day = (Waste wood (sawdust) mixed with K-001 - No charge at this plant)	$ 5,000.
3. Excavation of contaminated clay liner with backhoe - 4 days @ 200.00/day	$ 800.
4. Burning of oily waste K-001 as fuel in plant boiler $100/ton labor. 78 tons of K-001**	$ 7,800.
5. Off-site disposal of 80 tons of contaminated clay liner @ $56.00/ton (taxes included)	$ 4,480.
6. Transportation of clay off-site @ $30.00/ton (bulk shipment)	$ 2,400.
7. Testing of clay subsoil 10 samples @ $70.00/sample	$ 700.
8. Management Supervision 40 hours @ $15.00/hr.	$ 600.
9. Plant labor 200 hours @ $8.50/hr.	$ 1,700.
10. Clean filling of impoundment 80 additional cu.yd. @ $3.00/yd.	$ 240.
Labor, machine, and landscaping @ 5.00/yd.	$ 400.
11. Certification by Professional Engineer	$ 1,500.
	$25,870.00

II. Closure Cost (continued)

* Koppers demonstrated the effectiveness of this method of removal of creosote sludges at closure of its Memphis, TN. Terminal in September, 1982.

** The value of boiler steam produced has not been considered for Closure Cost. In normal operations, value received from burning waste off-sets labor and utilities consumed.

ATTACHMENT I

SCHEDULE FOR CLOSURE

KOPPERS COMPANY, INC.

MSD I.D.#MSD007027543

ACTIVITY	DAYS				
	0	90	120	150	180
1. Receipt of final volume of hazardous waste.	●				
2. Removal/disposal of final waste inventory.		●			
3. Decontamination of container storage facility.			●		
4. Removal/disposal of contaminated residue and equipment.				●	
5. Completion of closure and certification submittal to EPA Regional Administrator					●

FINANCIAL ASSURANCE MECHANISM FOR CLOSURE

This plant utilizes the corporate financial test to demonstrate Financial Assurance. Enclosed is a copy of the Chief Financial Officer's letter for 1983.

Environmental Resources and [illegible]
Pittsburgh, PA 15219. Telephone 4[illegible]-2607

Charles P. Brush
Manager
Environmental Planning
and Regulatory Analysis

KOPPERS

March 30, 1983

Mississippi Department of Natural
Resources
P. O. Box 10385
Jackson, MS. 39209

ATTN: RCRA Financial Requirements

Gentlepeople:

Enclosed is a letter from Koppers Company, Inc., Chief Financial Officer concerning RCRA Financial Requirements for 1983. Also enclosed is our certified public accontant's report on examination of Koppers' financial statement for the latest completed fiscal year. The enclosed 1982 Annual Report contains the SEC Form 10-K for the fiscal year ending December 31, 1982.

Be advised also that our insurance carrier, Travelers, has informed us that our Hazardous Waste Facility Liability Insurance was issued as a continuous policy with no expiration date. It therefore continues enforce for 1983.

If you have any questions concerning this submission, please contact me at the above telephone number and address.

Sincerely yours,

Charles P. Brush

CPB/s
enc.

Koppers Company, Inc. Finance Department
Pittsburgh, PA 15219 Telephone 412-227-2200

KOPPERS

A. William Capone
Senior Vice President
and Chief Financial Officer

March 30, 1983

Mississippi Department of Natural Resources
P. O. Box 10385
Jackson, MS 39209

Attention: RCRA Financial Requirements

Dear Sir:

I am the chief financial officer of Koppers Company, Inc., 436 Seventh Avenue, Pittsburgh, Pennsylvania 15219. This letter is in support of the use of the financial test to demonstrate financial responsibility for liability coverage and closure and/or post-closure care as specified in Subpart H of Mississippi Hazardous Waste Regulations Parts 264 and 265.

The owner or operator identified above is the owner or operator of the following facilities for which liability coverage is being demonstrated through the financial test specified in Subpart H of Mississippi Hazardous Waste Regulations Parts 264 and 265: See Attachments A and B.

1. The owner or operator identified above owns or operates the following facilities for which financial assurance for closure or post-closure care is demonstrated through the financial test specified in Subpart H of Mississippi Hazardous Waste Regulations Parts 264 and 265. The current closure and/or post-closure cost estimates covered by the test are shown for each facility.

	Current Estimates		
Plant and ID No.	Closure Cost	Post-Closure Cost	Total Cost
Grenada Plant P. O. Box 160 Grenada, MS 38960 MSD 007027543	$ 65,036	0	$ 65,036

2. The owner or operator identified above guarantees, through the corporate guarantee specified in Subpart H of Mississippi Hazardous Waste Regulations Parts 264 and 265, the closure and post-closure care of the following facilities owned or operated by its subsidiaries. The current cost estimates for the closure or post-closure care so guaranteed are shown for each facility:

	Current Estimates		
Plant and ID No.	Closure Cost	Post-Closure Cost	Total Cost
NONE			

3. In States where DNR is not administering the financial requirements of Subpart H of Mississippi Hazardous Waste Regulations Parts 264 and 265, this owner or operator is demonstrating financial assurance for the closure or post-closure care of the following facilities through the use of a test equivalent or substantially equivalent to the financial test specified in Subpart H of Mississippi Hazardous Waste Regulations Parts 264 and 265. The current closure and/or post-closure cost estimates covered by such a test are shown for each facility:

	Current Estimates		
Plant and ID No.	Closure Cost	Post-Closure Cost	Total Cost
See Attachments A and B			

4. The owner or operator identified above owns or operates the following hazardous waste management facilities for which financial assurance for closure or, if a disposal facility, post-closure care, is not demonstrated either to EPA or a State through the financial test or any other financial assurance mechanism specified in Subpart H of Mississippi Hazardous Waste Regulations Parts 264 and 265 or equivalent or substantially equivalent State mechanisms. The current closure and/or post-closure cost estimates not covered by such financial assurance are shown for each facility:

	Current Estimates		
Plant and ID No.	Closure Cost	Post-Closure Cost	Total Cost
NONE			

This owner or operator is required to file a Form 10K with the Securities and Exchange Commission (SEC) for the latest fiscal year.

The fiscal year of this owner or operator ends on December 31. The figures for the following items marked with an asterisk are derived from this owner's or operator's independently audited, year-end financial statements for the latest completed fiscal year, ended December 31, 1982.

ALTERNATIVE I

#1.	Sum of current closure and post-closure cost estimates (total of all cost estimates listed above)		$ 1,565,922
2.	Amount of annual aggregate liability coverage to be demonstrated		6,000,000
3.	Sum of Lines 1 and 2		7,565,922
*4.	Total Liabilities		558,869,000
*5.	Tangible Net Worth		627,029,000
*6.	Net Worth		634,055,000
*7.	Current Assets		490,127,000
*8.	Current Liabilities		246,374,000
9.	Net Working Capital		243,753,000
*10.	The sum of net income plus depreciation, depletion and amortization		45,750,000
*11.	Total assets in U. S.		Not Applicable
		Yes	No
12.	Is Line 5 at least $10 million?	x	
13.	Is Line 5 at least 6 times Line 3?	x	
14.	Is Line 9 at least 6 times Line 3?	x	
*15.	Are at least 90% of assets located in the US? If not, complete Line 16	x	
16.	Is Line 11 at least 6 times Line 3?	Not Applicable	
17.	Is Line 4 divided by Line 6 less than 2.0?	x	
18.	Is Line 10 divided by Line 4 greater than 0.1?		x
19.	Is Line 7 divided by Line 8 greater than 1.5?	x	

I hereby certify that the wording of this letter is identical to the wording specified in Mississippi Hazardous Waste Regulations as such regulations were constituted on the date shown immediately below.

Yours very truly,

A. W. Capone
Senior Vice President and
Chief Financial Officer
March 30, 1983

mv

ARTHUR YOUNG

ARTHUR YOUNG & COMPANY
2400 KOPPERS BUILDING
PITTSBURGH, PENNSYLVANIA 15219

(412) 288-4400

March 30, 1983

Mississippi Department of
Natural Resources
P.O. Box 10385
Jackson, MS 39209

Dear Sir:

We have examined the consolidated balance sheet of Koppers Company, Inc. and subsidiaries at December 31, 1982 and the related consolidated statements of income, changes in financial position and shareholders' equity other than redeemable convertible preference stock for the year then ended, and have issued our report thereon dated January 21, 1983.

Pursuant to the provisions of Environmental Protection Agency Regulation Subpart H of 40 CFR Parts 264 and 265, the chief financial officer, A. W. Capone, has prepared a letter dated March 30, 1983 demonstrating both liability coverage and assurance of closure or post-closure care. Certain data set forth in the March 30, 1983 letter is identified with an asterisk as having been derived from the independently audited, year-end consolidated financial statements. We have compared such data to the consolidated financial statements mentioned in the preceding paragraph.

In connection with the procedure referred to above, nothing came to our attention which caused us to believe that the financial data contained in the March 30, 1983 letter should be adjusted.

Very truly yours,

Arthur Young & Company

MISSISSIPPI MANUFACTURERS ASSOCIATION
P. O. BOX 22607 / 720 N. PRESIDENT ST. / (601) 948-1222 / JACKSON, MISS. 39205

October 15, 1980

HAZARDOUS WASTE SURVEY

TO: ALL MMA MEMBER FIRMS

The Governor and the State Board of Health need some basic information to guide them in possible efforts to develop an in-state interim solution to hazardous waste disposal problems which will arise when the federal law is implemented on November 19.

Answers are needed to the following questions:

1. Estimated volume(pounds, gallons, etc.) of hazardous wastes generated within a 30-day period? 6000 LBS

2. Are you currently shipping this waste out of state? ____ Yes

   X No

Keep in mind this law requires ANY AMOUNT of hazardous waste to be disposed in an approved site. Unless interim arrangements are made, even minimum amount generators will be required to ship out of state!

We hope you will cooperate to give us the basic information requested through the above two questions.

Thank you.

Name R.C. BARTLOW

Company KOPPERS CO INC

City TIE PLANT MS 38960

Please return the completed form as soon as possible since time is short (Before the November 19 implementation date).

2000-0356
9/30/83

CLOSURE AND POST-CLOSURE COMPLIANCE REVIEW CHECKLIST

I. GENERAL FACILITY INFORMATION

EPA ID # MSD007027543

Address Koppers Company, Inc
P.O. Box 160, Tie Plant, MS 38960

Owner _____
(name and phone number)

Operator _____
(name and phone number)

Name of Facility _____

Date & Time of ~~Inspection~~ Review Sept 1984

Personnel Present _____

Notes: Checklist evaluated for the SI closure Plan for closure of the container storage area too inadequate for evaluation

Type of Facility (check all that apply/fill-in blanks)

☐* X Storage ____ Treatment ____ Disposal

			Active	Inactive	Planned
☐	X	Containers	192 - 55 gal drums (number and volume)		
☐	____	Tanks	(number and volume)		
☐	____	Piles	(number and volume)		
☐	____	Incinerator	(gallons or tons per hour)		
☐	____	Landfill	(acres and volume)		
☐	____	Land Treatment	(acres and volume)		
☐	X	Surface Impoundment	284' X 95' X 10' (depth) ≈ 3/4 MG (acres and volume)		
☐	____	Chemical/Physical/ Biological Treatment	(gallons or tons per hour)		
☐	____	Thermal Treatment	(gallons or tons per hour)		
☐	____	Underground Injection	(nominal operating rate)		

Describe tank and container conditions (e.g., age, remaining surface life, etc.) in Comments section.

*Checkboxes indicate items to be reviewed during on-site visit.

II. WRITTEN PLAN

★ 1. Is there a WRITTEN CLOSURE PLAN kept at the facility? (40 CFR 265.112(a)) — ~~YES~~ NO

2. Does the closure plan cover all areas and facilities that were ACTIVE as of 11/19/80? — ~~YES~~ NO

3. Does the closure plan include general information about the facility which would be helpful in reviewing the plan, including:

a.	facility size(s)	YES	~~NO~~	
b.	facility type(s)	YES	~~NO~~	
c.	descriptions of all on-site equipment	YES	~~NO~~	
d.	topography	YES	~~NO~~	
e.	waste characterization	~~YES~~	NO	
f.	soil type	YES	~~NO~~	
g.	description of surrounding land use	YES	~~NO~~	
h.	surrounding population	YES	~~NO~~	
i.	size of facility (acres)	YES	~~NO~~	
j.	volume of impoundment	~~YES~~	NO	N/A
k.	type(s) of treatment/processing	YES	~~NO~~	N/A
l.	description of liner	~~YES~~	NO	N/A
m.	leachate collection system	YES	NO	~~N/A~~
n.	gas collection system	YES	NO	~~N/A~~
o.	dredging procedures/schedules, etc.	YES	NO	~~N/A~~
p.	incinerator specifications	YES	NO	~~N/A~~
q.	other (specify _____)	YES	NO	

III. MAXIMUM EXTENT OF OPERATION

★ 1. Does the plan identify the MAXIMUM EXTENT OF OPERATION which will be unclosed during the life of the facility? (40 CFR 265.112(a)(1)) — ~~YES~~ NO

□ 2. Is the MAXIMUM EXTENT OF OPERATION estimate exceeded by current operations? — YES ~~NO~~

□ 3. Does the MAXIMUM EXTENT OF OPERATION estimate include:

a.	the maximum area of landfill or land treatment ever containing wastes?	~~YES~~	NO	N/A
b.	inactive areas open because of operating problems or contingencies?	YES	NO	~~N/A~~
c.	maximum area of land ever used for land spreading?	YES	NO	~~N/A~~

d.	the most extensive treatment required for land spreading?	YES	NO	~~N/A~~
e.	the maximum area used for storage?	~~YES~~	NO	N/A

Explain each "NO" answer in comment section.

IV. PARTIAL CLOSURE

N/A

★ 1. Does the plan identify the steps for PARTIAL CLOSURE, at any time during the intended operating life, of

a.	surface impoundments?	YES	NO	N/A
b.	landfills?	YES	NO	N/A
c.	tanks?	YES	NO	N/A
d.	other (specify: _____)	YES	NO	

(40 CFR 265.112(a))

IF NO PARTIAL CLOSURE PLAN, CIRCLE N/A AND SKIP TO SECTION V.

2. Does the PARTIAL CLOSURE plan identify

a.	the size of areas partially closed?	YES	NO	N/A
b.	procedures for partial closure?	YES	NO	
c.	maintenance program?	YES	NO	
d.	frequency of partial closures?	YES	NO	
e.	source of cover materials?	YES	NO	N/A

□ 3. Does the plan for PARTIAL CLOSURE demonstrate the adequacy of the cap, etc. to meet the closure requirements? YES NO

OR

Are these areas or activities otherwise included in the extent of operations of the closure plan? YES NO

4. Does the PARTIAL CLOSURE PLAN describe maintenance activities for partially closed areas, including:

a.	visual inspections?	YES	NO	N/A
b.	ground-water monitoring?	YES	NO	N/A
c.	maintaining cover?	YES	NO	N/A
d.	maintaining diversion structures?	YES	NO	N/A
e.	controlling erosion?	YES	NO	N/A
f.	maintaining vegetation?	YES	NO	N/A
g.	security requirements?	YES	NO	N/A
h.	leachate collection?	YES	NO	N/A
i.	gas collection?	YES	NO	N/A

5. Does the PARTIAL CLOSURE PLAN describe maintenance <u>frequencies</u> for partially closed areas, including:

a.	visual inspections?	YES	NO	N/A
b.	groundwater monitoring?	YES	NO	N/A
c.	maintaining the cover?	YES	NO	N/A
d.	maintaining diversion structures?	YES	NO	N/A
e.	controlling erosion?	YES	NO	N/A
f.	maintaining vegetation?	YES	NO	N/A
g.	security requirements?	YES	NO	N/A
h.	leachate collection?	YES	NO	N/A
i.	gas collection?	YES	NO	N/A

6. Is there a SCHEDULE FOR PARTIAL CLOSURE? YES NO
If "NO" SKIP TO SECTION V.

7. Does the SCHEDULE FOR PARTIAL CLOSURE include:

★ a.	date(s) of partial closure(s)? (40 CFR 265.112(a)(1))	YES	NO	
b.	total time required for each partial closure?	YES	NO	
c.	time required for key steps--			
i.	waste removal?	YES	NO	N/A
ii.	waste stabilization?	YES	NO	N/A
iii.	waste treatment?	YES	NO	N/A
iv.	waste disposal?	YES	NO	N/A
v.	placement of cover?	YES	NO	N/A
vi.	vegetation?	YES	NO	N/A
vii.	decontamination?	YES	NO	N/A
viii.	other (specify: _____)	YES	NO	

V. <u>MAXIMUM INVENTORY</u>

★ 1.	Is there an estimate of the MAXIMUM INVENTORY of wastes in storage or treatment at any time during the life of the facility? (40 CFR 265.112(a)(2))	~~YES~~	NO	N/A

□ 2. Does the MAXIMUM INVENTORY estimate include the maximum amount of on-site wastes:

a.	requiring pre-treatment?	YES	NO	~~N/A~~
b.	requiring treatment?	YES	NO	~~N/A~~
c.	requiring disposal?	~~YES~~	NO	N/A

☐	3.	Does the MAXIMUM INVENTORY estimate include the maximum amount of on-site:			
☐		a. wastes in surface impoundments?	~~YES~~	NO	N/A
☐		b. wastes in partially-closed non-disposal surface impoundments?	YES	NO	~~N/A~~
☐		c. wastes in tanks?	YES	NO	~~N/A~~
☐		d. wastes in piles?	YES	NO	~~N/A~~
☐		e. wastes in drainage pits?	YES	NO	~~N/A~~
☐		f. wastes in containers?	~~YES~~	NO	N/A
☐		g. standing liquids?	~~YES~~	NO	N/A
☐		h. sludge?	~~YES~~	NO	N/A
☐		i. contaminated soil from land treatment fields?	YES	NO	~~N/A~~
☐		j. contaminated soil and liners from non-disposal impoundments?	~~YES~~	NO	N/A
☐		k. contaminated soil from around tanks, containers, piles?	YES	~~NO~~	N/A
☐		l. process residues?	YES	NO	~~N/A~~
☐		m. decontamination residues?	~~YES~~	NO	N/A
	4.	Does the plan discuss the type(s) of TESTING AND CRITERIA to be used to determine:			
		a. whether soil is contaminated?	~~YES~~	NO	N/A
		b. whether decontamination residues are hazardous?	YES	NO	~~N/A~~
		c. whether process residues are hazardous?	YES	NO	~~N/A~~
	5.	Are INCOMPATIBLE WASTES identified and provisions described for keeping them separate during closure?	YES	NO	~~N/A~~

VI. FINAL CLOSURE

	1.	Does the plan clearly identify the STEPS TO CLOSE			
★		a. at any point during the intended operating life? (40 CFR 265.112(a))	~~YES~~	NO	
★		b. at the end of the intended operating life? (40 CFR 265.112(a))	~~YES~~	NO	

2. Do the STEPS TO CLOSE in the plan include:

★	a.	removal of wastes? (40 CFR 265.113(a))	~~YES~~	NO	N/A
★	b.	treatment of wastes? (40 CFR 265.113(a))	YES	NO	~~N/A~~
★	c.	waste disposal? (40 CFR 265.113(a))	YES	NO	~~N/A~~
	d.	waste containment?	~~YES~~	NO	N/A
★	e.	cover? (40 CFR 265.310(b))	~~YES~~	NO	N/A
★	f.	decontamination of equipment and structures? (40 CFR 265.112(a)(3))	~~YES~~	NO	N/A
	g.	groundwater monitoring?	~~YES~~	NO	N/A
★	h.	closure certification? (40 CFR 265.115)	~~YES~~	NO	
	i.	maintenance of leachate program?	YES	NO	~~N/A~~
	j.	maintenance of gas collection program?	YES	NO	~~N/A~~
	k.	security requirements?	YES	~~NO~~	N/A

□ 3. With respect to the REMOVAL, TREATMENT, OR DISPOSAL of waste, does the plan identify:

a.	the source and type of materials and equipment needed?	~~YES~~	NO	
b.	the amount of labor required?	~~YES~~	NO	
c.	the capacity, number, and location of trenches or cells needed?	YES	NO	~~N/A~~
d.	the area required for landspreading?	YES	NO	~~N/A~~

□ 4. Does the plan describe the CONTAINMENT of waste, including:

★	a.	placement of final cover: (40 CFR 265.280(c)(2); 265.310(a))			
★		i. characteristics of cover? (40 CFR 265.280(c)(2)(ii); 265.310(a)(5))	~~YES~~	NO	N/A
★		ii. design of cover including final surface contours? (40 CFR 265.280(c)(2)(ii); 265.310(a)(5))	~~YES~~	NO	N/A
		iii. installation procedures?	~~YES~~	NO	N/A
★	b.	drainage and diversion structures? (40 CFR 265.280(c)(3),(4))	YES	~~NO~~	N/A

c. vegetation program:

★	i. characteristics of vegetation? (40 CFR 265.280(c)(2)(ii); 265.310(a)(5))	~~YES~~	NO	N/A
	ii. soil preparation?	~~YES~~	NO	N/A
★	d. erosion control: (40 CFR 265.310(b)(3))			
	i. type of materials?	~~YES~~	NO	N/A
	ii. amount of materials?	~~YES~~	NO	N/A
★	e. For landfills, does the closure plan address the following objectives and indicate how they will be achieved? (40 CFR 265.310(b))			
	(1) Control of pollution migration from the facility via ground water, surface water, and air.	~~YES~~	NO	N/A
	(2) Control of surface water infiltration, including prevention of pooling.	~~YES~~	NO	N/A
	(3) Prevention of erosion.	~~YES~~	NO	N/A
★	f. For land treatment operations, does the closure plan address the following objectives and indicate how they will be achieved? (40 CFR 265.280(a))			
	(1) Control of migration of hazardous wastes and constituents into ground water.	YES	NO	~~N/A~~
	(2) Control of the release of contaminated run-off into surface water.	YES	NO	~~N/A~~
	(3) Control of the release of airborne particulate contaminants caused by wind erosion.	YES	NO	~~N/A~~
	(4) Protection of food chain crops.	YES	NO	~~N/A~~

★ g. For landfills and land treatment operations, does the closure plan include at least a narrative statement indicating that the following factors were considered in addressing the closure objectives? (40 CFR 265.280(b), 310(b))

(1) Type and amount of waste.	~~YES~~	NO	N/A
(2) Mobility and rate of migration.	~~YES~~	NO	N/A
(3) Site location, topography, and surrounding land use.	~~YES~~	NO	N/A
(4) Climate, including precipitation.	~~YES~~	NO	N/A
(5) Characteristics of the cover, including material, final surface contour, thickness, porosity, permeability, slope, vegetation.	YES	~~NO~~	N/A
(6) Geological and soil profiles and surface and subsurface hydrology.	YES	~~NO~~	N/A
(7) Unsaturated zone monitoring.	YES	~~NO~~	N/A
(8) Type, concentration, and depth of hazardous constituent migration as compared to background concentrations.	YES	~~NO~~	N/A

□ ★ 5. Does the plan describe the DECONTAMINATION (40 CFR 265.112(a)(3); 265.114) of facility equipment and structures, including:

a. a list of equipment, containers, and structures requiring disposal or decontamination?	~~YES~~	NO	N/A
b. decontamination procedures?	~~YES~~	NO	N/A
c. method of treatment or disposal of residues?	~~YES~~	NO	N/A
d. testing program?	YES	NO	~~N/A~~

□ 6. With respect to MONITORING, does the closure plan describe:

a. details of the groundwater monitoring program during closure?	~~YES~~	NO	N/A
b. soil testing and monitoring	~~YES~~	NO	N/A
c. maintenance of monitoring equipment during closure?	YES	~~NO~~	N/A
d. other (specify: _____	YES	NO	

★ 7. With respect to CERTIFICATION of closure (40 CFR 265.115), does the closure plan describe scheduled or estimated number of inspections? ~~YES~~ NO

□ 8. If a system for COLLECTING LEACHATE is present, does the closure plan:

a. describe leachate removal, treatment, and disposal during closure?	YES	NO	~~N/A~~
b. identify the approximate volume of leachate collected?	YES	NO	~~N/A~~
c. provide for maintenance of the leachate collection system during closure?	YES	NO	~~N/A~~

□ 9. If a GAS COLLECTION SYSTEM is required during operation, does the closure plan:

a. describe procedures for collecting gas during closure?	YES	NO	~~N/A~~
b. describe monitoring samples and analysis during closure?	YES	NO	~~N/A~~
c. maintenance of gas collection system during closure?	YES	NO	~~N/A~~

□ 10. If SECURITY (i.e., fencing) is required, does the closure plan:

a. describe the maintenance of security equipment during the closure period?	YES	~~NO~~	N/A
b. describe the installation of appropriate equipment at closure?	YES	~~NO~~	N/A
c. state the dimensions of the fence and the area to be enclosed?	YES	~~NO~~	N/A

VII. FINAL CLOSURE: SCHEDULE

★	1.	Does the plan identify the YEAR when final closure is expected to occur? (40 CFR 265.112(a)(4))	YES	~~NO~~	
		• What is the expected year of closure?	_____		
★	2.	Is there a SCHEDULE for final closure activities? (40 CFR 265.112(a)(4))	~~YES~~	NO	
		IF "NO" SKIP TO COMMENTS SECTION.			
	3.	Does the SCHEDULE for final closure include:			
★	a.	date closure is expected to begin? (40 CFR 265.112(a)(1))	YES	~~NO~~	
★	b.	total time required to close? (40 CFR 265.112(a)(4))	~~YES~~	NO	
★	c.	the time for intervening closure activities? (40 CFR 265.112(a)(4))	~~YES~~	NO	
	d.	time required for key steps:			
★		i. waste inventory treatment? (40 CFR 265.112(a)(4))	YES	NO	~~N/A~~
★		ii. waste inventory disposal? (40 CFR 265.112(a)(4))	YES	NO	~~N/A~~
		iii. removal of waste inventory and residues?	~~YES~~	NO	N/A
		iv. decontamination of facility equipment and structures?	~~YES~~	NO	N/A
		v. install containment and diversion structures?	YES	~~NO~~	N/A
★		vi. placement of final cover? (40 CFR 265.112(a)(4))	~~YES~~	NO	N/A
		vii. planting vegetation?	~~YES~~	NO	N/A
		viii. closure certification?	~~YES~~	NO	
		ix. other (specify: _____ _____)	YES	NO	
	4.	Does the SCHEDULE for final closure:			
★	a.	encompass more than 90 days for treatment, removal, or disposal of hazardous wastes after receipt of final volume of wastes? (40 CFR 265.113(a))	YES	~~NO~~	

★ b. encompass more than 180 days for completion of closure plan activities after receipt of final volume of wastes? (40 CFR 265.113(b)) YES ~~NO~~

VIII. COMMENTS

Plan does not include notice in deed nor local land authority.

SEE Q # 3 p. 3

Container Storage a more detailed plan is necessary. Plan not adequate

POST-CLOSURE PLAN CHECKLIST

N/A

I. WRITTEN PLAN

★	1. Is there a written POST-CLOSURE PLAN at the facility? (40 CFR 265.118(a)) If answer is "N/A" skip to cost estimate checklists.	YES	NO	N/A
	2. Does the post-closure plan cover the MAXIMUM AREA EXPECTED TO CONTAIN HAZARDOUS WASTE after closure, including:			
	a. landfills?	YES	NO	N/A
	b. disposal surface impoundments?	YES	NO	N/A
	c. land treatment facilities where hazardous waste will remain?	YES	NO	N/A
	d. other remaining hazardous wastes?	YES	NO	N/A
★	3. Does the post-closure plan provide for 30 years of post-closure care? (40 CFR 265.117(a))	YES	NO	
	• How many years of post-closure care? _____			
	4. Does the post-closure plan cover all areas where hazardous waste will remain that were active as of 11/19/80?	YES	NO	

II. SPECIFIC POST-CLOSURE PLAN REQUIREMENTS

★	1. Does the plan clearly identify the ACTIVITIES required in post-closure care? (40 CFR 265.118(a))	YES	NO	
★	2. Does the plan clearly identify the FREQUENCIES for post-closure activities? See also Question 5. (40 CFR 265.118(a))	YES	NO	
★	3. Do the GROUNDWATER MONITORING plans (40 CFR 265.117(a)(1); 265.118(a)(1)) include:			
	a. number of wells?	YES	NO	
	b. sample collection activities?	YES	NO	
	c. sample collection frequencies?	YES	NO	
	d. sample test activities?	YES	NO	
	e. sample test frequencies?	YES	NO	
	f. replacement of failed wells?	YES	NO	N/A

	4.	Is there a copy of the GROUNDWATER SAMPLING AND ANALYSIS PROGRAM attached to the plan?	YES	NO	
★	5.	Do the MAINTENANCE PLANS for waste containment structures (40 CFR 265.118(a)(2)) include:			
	a.	inspection activities?	YES	NO	
	b.	inspection frequencies?	YES	NO	
	c.	maintaining final cover (erosion damage repair) activities?	YES	NO	
★	d.	maintaining final cover (erosion damage repair) frequencies? (40 CFR 265.310(d)(1))	YES	NO	
	e.	vegetation and fertilizing activities?	YES	NO	
★	f.	vegetation and fertilizing frequencies? (40 CFR 265.118(a)(2)(i))	YES	NO	
	g.	mowing activities?	YES	NO	
	h.	mowing frequencies?	YES	NO	
★	i.	collecting, removing, and treating leachate activities? (40 CFR 265.310(d)(2))	YES	NO	N/A
★	j.	collecting, removing, and treating leachate frequencies? (40 CFR 265.310(d)(2))	YES	NO	N/A
★	k.	gas collection activities? (40 CFR 265.310(d)(3))	YES	NO	N/A
★	l.	gas collection frequencies? (40 CFR 265.310(d)(3))	YES	NO	N/A
	m.	collection and treatment of runoff?	YES	NO	
	n.	frequencies of runoff collection and treatment?	YES	NO	
★	6.	Do MONITORING EQUIPMENT MAINTENANCE plans (40 CFR 265.118(a)(2)(ii)) include:			
★	a.	activities? (40 CFR 265.118(a)(2)(ii))	YES	NO	
★	b.	frequencies? (40 CFR 265.118(a)(2)(ii))	YES	NO	
	7.	Do SECURITY REQUIREMENT plans include:			
	a.	activities?	YES	NO	
	b.	frequencies?	YES	NO	
★	8.	Does the plan identify the name, address and phone number of the POST-CLOSURE PERIOD CONTACT? (40 CFR 265.118(a)(3))	YES	NO	

★ 9. For landfills, does the post-closure plan address the following objectives and indicate how they will be achieved? (40 CFR 265.310(b))

(1) Control of pollution migration via ground water, surface water, and air.	YES	NO	N/A
(2) Control of surface water infiltration, including prevention of pooling.	YES	NO	N/A
(3) Prevention of erosion.	YES	NO	N/A

★ 10. For land treatment operations, does the post-closure plan address the following objectives and indicate how they will be achieved? (40 CFR 265.280(a))

(1) Control of migration of hazardous wastes and constituents into the ground water.	YES	NO	N/A
(2) Control of the release of contaminated runoff into surface water.	YES	NO	N/A
(3) Control of the release of airborne particulate contaminants caused by wind erosion.	YES	NO	N/A
(4) Protection of food chain crops.	YES	NO	N/A

★ 11. For landfills and land treatment operations, does the post-closure plan include at least a narrative statement indicating that the following factors were considered in addressing the closure objectives? (40 CFR 265.280(b), 310(b))

(1) Type and amount of waste.	YES	NO	N/A
(2) Mobility and rate of migration.	YES	NO	N/A
(3) Site location, topography, and surrounding land use.	YES	NO	N/A
(4) Climate, including precipitation.	YES	NO	N/A

(5)	Characteristics of the cover, including material, final surface contour, thickness, porosity, permeability, slope, vegetation.	YES	NO	N/A
(6)	Geological and soil profiles and surface and subsurface hydrology.	YES	NO	N/A
(7)	Unsaturated zone monitoring.	YES	NO	N/A
(8)	Type, concentration, and depth of hazardous constituent migration as compared to background concentrations.	YES	NO	N/A

III. OTHER REQUIREMENTS

★ 1.	Does the plan address the requirement for notice to the local land authority? (40 CFR 265.119)	YES	NO	
★ 2.	Does the plan address the requirement for notice in the deed? (40 CFR 265.120)	YES	NO	
3.	Does the plan address the protection and maintenance of surveyed benchmarks?	YES	NO	N/A

IV. COMMENTS

No post closure care required, leaving site clean

WORKSHEET 1A: FILL-IN QUANTITIES

HYPOTHETICAL MAXIMUM INVENTORY OF WASTES IN PLAN

Type of Waste	Grand Total (indicate units)	Facility Type #1 (Specify) Total (indicate units)	Facility Type #2 (Specify) Total (indicate units)	Facility Type #3 (Specify) Total (indicate units)
1. Maximum amount of undisposed waste requiring pre-treatment				
2. Maximum amount of waste resulting from pre-treatment				
3. Maximum amount of undisposed waste requiring treatment				
4. Maximum amount or waste resulting from treatment				
5. Maximum amount of undisposed waste in storage prior to disposal				
-- in tanks				
-- in surface impoundments				
-- in waste piles				
-- in drainage pits				
-- in containers				
-- standing liquids (not included in the estimates above)				
-- sludge (not included in the estimates above)				
-- liners				
-- leachate				
-- other (specify: _____)				
6. Maximum amount of contaminated soil				
-- in land treatment fields				
-- in non-disposal surface impoundments				
-- around tanks				
-- around containers				
-- around treatment facilities				
-- from facility decontamination (list only if not included in estimates above)				
7. Maximum amount of residues				
-- from treatment/disposal processes				
-- from facility decontamination				
GRAND TOTAL				

Use these columns to distinguish among different waste management operations. For example certain types of wastes may be stored in containers prior to incineration; other types may be stored in containers prior to being landfilled. To be sure that the closure plan has accounted for all containers, the columns may be used to collect subtotals. Where the plan omitted to count some category or the maximum inventory, please circle the line where the entry should go. Avoid double-counting.

WORKSHEET 1B

CLOSURE PLAN DESCRIPTION OF METHOD OF TREATMENT OR DISPOSAL OF MAXIMUM INVENTORY OF WASTES: CHECKLIST

Type of Waste	On-Site			Off-Site			
	Pre-Treatment Method Described?	Treatment Method Described?	Disposal Method Described?	Removal Method Described?	Treatment Method Identified?	Disposal Method Identified?	TSDF Identified?
1. Waste in storage							
-- in tanks							
-- in surface impoundments							
-- in waste piles							
-- in drainage pits							
-- in containers							
-- standing liquids (not included in estimates above)							
-- sludge (not included in estimates above)							
-- liner							
-- leachate							
-- other (specify: _____)							
2. Contaminated soil							
-- in land treatment fields							
-- in non-disposal surface impoundments							
-- around tanks							
-- around containers							
-- around treatment facilities							
- from facility decontamination (list only if not included in estimates above)							
3. Residues							
-- from treatment/disposal processes							
-- from facility decontamination							

WORKSHEET 1C: FILL-IN QUANTITIES

PLAN FOR REMOVAL, TREATMENT, OR DISPOSAL OF MAXIMUM WASTE INVENTORY

Type of Waste	GRAND TOTAL (Specify) (indicate units)				FROM FACILITY TYPE #1* (Specify) (indicate units)				FROM FACILITY TYPE #2* (Specify) (indicate units)			
	On-Site		Off-Site		On-Site		Off-Site		On-Site		Off Site	
	Treatment	Disposal	Treatment	Disposal	Treatment	Disposal	Treatment	Disposal	Treatment	Disposal	Treatment	Disposal
1. Maximum amount of undisposed waste requiring pre-treatment												
2. Maximum amount of waste resulting from pre-treatment												
3. Maximum amount of undisposed waste requiring treatment												
4. Maximum amount of waste resulting from treatment												
5. Maximum amount of undisposed waste in storage prior to disposal												
-- in tanks												
-- in surface impoundments												
-- in waste piles												
-- in drainage pits												
-- in containers												
-- standing liquids (not included in the estimates above)												
-- sludge (not included in the estimates above)												
-- liners												
-- leachate												
-- other (specify: _____)												

WORKSHEET 1C: FILL IN QUANTITIES

PLAN FOR REMOVAL, TREATMENT, OR DISPOSAL OF MAXIMUM WASTE INVENTORY

Type of Waste	GRAND TOTAL (Specify) (indicate units)				FROM FACILITY TYPE #1* (Specify) (indicate units)				FROM FACILITY TYPE #2* (Specify) (indicate units)			
	On-Site		Off Site		On-Site		Off-Site		On-Site		Off-Site	
	Treatment	Disposal	Treatment	Disposal	Treatment	Disposal	Treatment	Disposal	Treatment	Disposal	Treatment	Disposal
6. Maximum amount of contaminated soil												
-- in land treatment fields												
-- in non-disposal surface impoundments												
-- around tanks												
-- around containers												
-- around treatment facilities												
-- from facility decontamination (list only if not included in estimates above)												
7. Maximum amount of residues												
-- from treatment/disposal processes												
-- from facility decontamination												
GRAND TOTAL												

2000-0356
9/30/83

GENERAL COST ESTIMATE CHECKLIST

A. Closure Cost Estimate

★ 1. Is there a written closure cost estimate? (40 CFR 265.142(a)) ~~YES~~ NO

2. What is the amount of the closure cost estimate? $ 33,796

3. Is there documentation supporting the cost estimate? ~~YES~~ NO

   a. Work-ups? ~~YES~~ NO
   b. Contractor bids? ~~YES~~ NO
   c. Operating history? ~~YES~~ NO
   d. Other _____ YES NO

★ 4. Has the cost estimate been adjusted by the 9% inflation factor? (40 CFR 265.142(b)) YES NO N/A

5. Does the cost estimate cover all the activities in the closure plan including costs of labor? ~~YES~~ NO

★ 6. Does the closure cost estimate cover all required closure activities? (40 CFR 265.142(a)) If "NO" specify in comments below. ~~YES~~ NO

Comments: _____

B. Post-Closure Cost Estimate N/A

★ 1. Is there a written post-closure cost estimate? (40 CFR 265.144(a)) YES NO N/A

2. What is the amount of the estimate? $ _____

3. Is there documentation supporting the post-closure cost estimate? YES NO

a. Work-ups? YES NO
b. Contractor bids? YES NO
c. Operating history? YES NO
d. Other _____ YES NO

★ 4. Is the annual estimate multiplied by 30 to cover to entire post-closure care period? (40 CFR 265.144(b)) YES NO

★ 5. Has the cost estimate been adjusted by the 9% inflation factor? (40 CFR 265.144(b)) YES NO N/A

★ 6. Does the cost estimate cover all the activities in the post-closure plan (40 CFR 265.118)? YES NO

Including labor costs? YES NO

★ As well as the requirements of notice to local land authorities and in deeds? (40 CFR 265.119, 265.120) YES NO

★ 7. Does the post-closure cost estimate cover all required post-closure activities? (40 CFR 265.144(a)) YES NO
If "NO" specify in comments below.

Comments: _____

CLOSURE COST ESTIMATE VERIFICATION

Does Not Apply	Applies	
	In-cluded	Not In-cluded
	X	
X		

(40 CFR 265.112(a)(2))

★

1. TREATING, DISPOSING OR REMOVING INVENTORY

A. On Site

a. Amount of inventory and residues* to be disposed on site (yd^3)
   i. From cost estimate _____
   ii. From closure plan _____
☐ iii. From visual inspection _____

b. Unit cost for on site treatment or disposal ($/$yd^3$)
   i. From cost estimate _____

c. Total cost of on site treatment or disposal ($)
   i. From cost estimate _____

	X	

B. Off Site

a. Amount of inventory and residues to be disposed off site (yd^3)
   i. From cost estimate _____
   ii. From closure plan _____
☐ iii. From visual inspection _____

b. Unit cost for off site treatment or disposal ($/$yd^3$)
   i. From cost estimate _____

c. Total cost for off-site disposal excluding transportation
   i. From cost estimate _____

*Residues here refer to residues existing at initiation of closure.

Does Not Apply	Applies	
	Included	Not Included

d. Unit cost for transport of inventory ($/yd³/mile)
   i. From cost estimate _____

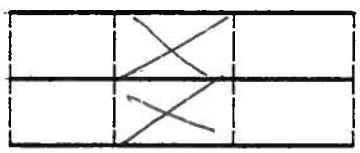
e. Transport distance (miles)
   i. From cost estimate _____
   ii. By map reference _____

f. Cost of transport ($)
   i. From cost estimate _____

g. Cost of off site treatment or disposal including transport ($)
   i. From cost estimate _____
   ii. Inspector calculation _____

C. Total Cost of Treating, Disposing or Removing Inventory ($)

   a. From cost estimate _____



2. DECONTAMINATION

A. Soil Excavation

(40 CFR 265.280(c)(1))

   a. Volume of soil to be removed (yd³)
      i. From cost estimate _____
      ii. From closure plan _____
      ☐ iii. Inspector's estimate _____

   b. Unit cost for soil excavation ($/yd³)
      i. From cost estimate _____

   c. Total cost of contaminated soil excavation ($)
      i. From cost estimate _____

Does Not Apply	Applies	
	Included	Not Included
	X	

B. Wastewater Removal

a. Volume of wastewater to be removed (yd^3)
   i. From cost estimate _____
   ii. From closure plan _____
☐ iii. Inspector's estimate _____

b. Unit cost for wastewater removal ($/$yd^3$)
   i. From cost estimate _____

c. Total cost of wastewater removal ($)
   i. From cost estimate _____

X		

C. On Site Treatment or Disposal of Contaminated Soil, Wastewater and Residues Generated During Decontamination

a. Volume of soil, wastewater and residues to be treated/disposed on site (yd^3)
   i. From cost estimate _____
   ii. From closure plan _____
☐ iii. Inspector's estimate _____

b. Unit cost for treatment/disposal ($/$yd^3$)
   i. From cost estimate _____

c. Cost of on site treatment/disposal ($)
   i. From cost estimate _____

	X	

D. Off Site Treatment or Disposal of Contaminated Soil, Wastewater and Residues Generated During Decontamination

a. Volume of soil, wastewater and residues to be treated/disposed off site (yd^3)
   i. From cost estimate _____
   ii. From closure plan _____
☐ iii. From visual inspection _____

Does Not Apply	Applies	
	In-cluded	Not In-cluded

b. Unit cost for off site treatment/ disposal ($/yd^3)
   i. From cost estimate _____

c. Cost of off site treatment/disposal ($) excluding transportation
   i. From cost estimate _____

d. Unit cost for transport ($/yd^3/mile)
   i. From cost estimate _____

e. Transport distance (miles)
   i. From cost estimate _____
   ii. By map reference _____

f. Cost of transport ($)
   i. From cost estimate _____

g. Total cost of off site treatment or disposal including transport ($)
   i. From cost estimate _____

	X	

(40 CFR 265.112(a)(3))

★

E. Equipment Decontamination

a. Amount of equipment to be decontaminated (tons)
   i. From cost estimate _____
   ii. From closure plan _____
□ iii. Inspector's estimate _____

b. Unit cost for equipment decontamination ($/ton)
   i. From cost estimate _____

c. Cost of equipment decontamination ($)
   i. From cost estimate _____

	X	

F. Total Cost of Decontamination ($)

a. From cost estimate _____

Does Not Apply	Applies	
	Included	Not Included

	X	

(40 CFR 265.115)

★

3. CERTIFICATION

A. Professional Engineer Hours (hrs)

a. From cost estimate _____
b. From closure plan _____
☐ c. Inspector's estimate _____

B. Unit Cost for Professional Engineer* ($/hr.)

a. From cost estimate _____

	X	

C. Total Certification Cost ($)

a. From cost estimate _____

	X	
	X	

(40 CFR 265.112(a)(4); 265.280(c)(2))

★

4. COVER

A. Cover Material**

a. Area to be covered (yd^2)
i. From cost estimate _____
ii. From closure plan _____
☐ iii. From visual inspection _____

b. Depth of cover material (yd)
i. From cost estimate _____
ii. From closure plan _____
☐ iii. Inspector's estimate _____

*Loaded with costs for support personnel.

**Includes materials to be used for cover, for example gravel or clay, except for top-soil.

Does Not Apply	Applies	
	In-cluded	Not In-cluded

c. Volume of material to be obtained on site (yd^3)
   i. From cost estimate _____
   ii. From closure plan _____
☐ iii. Inspector's estimate _____

d. Volume of material to be obtained off site (yd^3)
   i. From cost estimate _____
   ii. From closure plan _____
☐ iii. Inspector's estimate _____

e. Unit cost of excavating material on site ($/$yd^3$)
   i. From cost estimate _____

f. Unit cost of purchasing material off site ($/$yd^3$)
   i. From cost estimate _____

g. Unit cost of transporting material ($/$yd^3$/mile)
   i. From cost estimate _____

h. Transport distance (miles)
   i. From cost estimate _____
   ii. By map reference _____

i. Transport cost ($)
   i. From cost estimate _____

j. Total cost of acquiring material ($)
   i. From cost estimate _____

k. Unit cost of spreading and compacting material ($/$yd^3$)
   i. From cost estimate _____

l. Cost of spreading and compacting material ($)
   i. From cost estimate _____

m. Total cost of acquiring and placing material ($)
   i. From cost estimate _____

Does Not Apply	Applies	
	Included	Not Included
	X	

B. Top-soil

a. Area to be covered (yd^2)
   i. From cost estimate _____
   ii. From closure plan _____
□ iii. From visual inspection _____

b. Depth of top-soil, allowing for appropriate grading (yd)
   i. From cost estimate _____
   ii. From closure plan _____
□ iii. Inspector's estimate _____

c. Volume of top-soil to be obtained on site (yd^3)
   i. From cost estimate _____
   ii. From closure plan _____
□ iii. Inspector's estimate _____

d. Volume of top-soil to be obtained off site (yd^3)
   i. From cost estimate _____
   ii. From closure plan _____
□ iii. Inspector's estimate _____

e. Unit cost of excavating top-soil on site ($/yd^3$)
   i. From cost estimate _____

f. Unit cost of purchasing top-soil off site ($/yd^3$)
   i. From cost estimate _____

g. Unit cost of transporting top-soil ($/yd^3$/mile)
   i. From cost estimate _____

h. Transport distance (miles)
   i. From cost estimate _____
   ii. By map reference _____

Does Not Apply	Applies	
	Included	Not Included

i. Transport cost ($)
   i. From cost estimate _____

j. Total cost of acquiring top-soil ($)
   i. From cost estimate _____

k. Unit cost of spreading and compacting top-soil ($/yd^3)
   i. From cost estimate _____

l. Cost of spreading and compacting top-soil ($)
   i. From cost estimate _____

m. Total cost of acquiring and placing top-soil ($)
   i. From cost estimate _____

X		

C. Synthetic Liner and Buffer Material

a. Area to be covered (yd^2)
   i. From cost estimate _____
   ii. From closure plan _____
☐ iii. From visual inspection _____

b. Depth of sand* buffer (yd)
   i. From cost estimate _____
   ii. From closure plan _____
☐ iii. Inspector's estimate _____

c. Volume of sand to be obtained on site (yd^3)
   i. From cost estimate _____
   ii. From closure plan _____
☐ iii. Inspector's estimate _____

*Includes other materials (other than clay and top-soil) which may be used along with the synthetic liner.

Does Not Apply	Applies	
	Included	Not Included

d. Volume of sand to be obtained off site (yd^3)
   i. From cost estimate _____
   ii. From closure plan _____
□ iii. Inspector's estimate _____

e. Unit cost of excavating sand on site ($/$yd^3$)
   i. From cost estimate _____

f. Unit cost of purchasing sand off site ($/$yd^3$)
   i. From cost estimate _____

g. Unit cost of transporting sand ($/$yd^3$/mile)
   i. From cost estimate _____

h. Transport distance (miles)
   i. From cost estimate _____
   ii. By map reference _____

j. Total cost of acquiring sand ($)
   i. From cost estimate _____

k. Unit cost of spreading and compacting sand ($/$yd^3$)
   i. From cost estimate _____

l. Cost of spreading and compacting sand ($)
   i. From cost estimate _____

m. Total cost of acquiring and placing sand ($)
   i. From cost estimate _____

n. Unit cost of acquiring and installing synthetic liner ($/$yd^2$)
   i. From cost estimate _____

o. Cost of acquiring and installing synthetic liner ($)
   i. From cost estimate _____

p. Unit cost of acquiring and installing synthetic liner and buffer materials ($/$yd^2$)
   i. From cost estimate _____

Does Not Apply	Applies	
	Included	Not Included

q. Total cost of acquiring and installing synthetic liner and buffer materials ($)
   i. From cost estimate _____

	X	

D. Total Cover Cost

a. Unit cost of cover ($/yd^2)
   i. From cost estimate _____

b. Total cost of cover ($)
   i. From cost estimate _____

	X	

5. Vegetation

(40 CFR 265.280(c)(2)(ii))

A. Area in Need of Vegetation (yd^2)
   a. From cost estimate _____
   b. From closure plan _____
   ☐ c. From visual inspection _____

B. Unit Cost for Acquiring and Placing Seed, Fertilizer, Etc. ($/yd^2)
   a. From cost estimate _____

C. Total cost of Acquiring and Placing Seed, Fertilizer, Etc. ($)
   a. From cost estimate _____

6. Other (from cost estimate) ($) _____

_____ (specify) $ _____

_____ (specify) $ _____

7. Total Closure Costs ($) _____

A. From cost estimate _____

COMMENTS

POST-CLOSURE COST ESTIMATE VERIFICATION

N/A

Does Not Apply	Applies	
	Included	Not Included

1. INSPECTION/FACILITY VISITS

A. Total hours of professional level personnel (hrs/year)
   a. From cost estimate _____
   b. From post-closure plan _____
☐ c. Inspector's estimate _____

B. Unit cost for professional level personnel*($/hr)
   a. From cost estimate _____

C. Total inspection/facility visit cost ($/year)
   a. From cost estimate _____

2. REESTABLISHING FINAL COVER AND VEGETATION

(40 CFR 265.118(a)(2)(i); 265.310(d)(1))

A. Area involved (yd^2)
   a. From cost estimate _____
   b. From post-closure plan _____
☐ c. From visual inspection _____

★

B. Unit cost for reestablishing cover and vegetation ($/$yd^2$)
   a. From cost estimate _____

C. Reestablishing cover and vegetation cost ($/year)
   a. From cost estimate _____

*Loaded with costs for support personnel.

Does Not Apply	Applies	
	Included	Not Included

3. FERTILIZING

A. Area involved (yd^2)
   a. From cost estimate _____
   b. From post-closure plan _____
☐ c. From visual inspection _____

B. Unit cost for fertilizing ($/$yd^2$)
   a. From cost estimate _____

C. Total fertilizing cost ($/year)
   a. From cost estimate _____

4. MOWING

A. Area involved (yd^2)
   a. From cost estimate _____
   b. From post-closure plan _____
☐ c. From visual inspection _____

B. Unit cost for mowing ($/$yd^2$)
   a. From cost estimate _____

C. Mowing cost ($/year)
   a. From cost estimate _____

5. GROUNDWATER MONITORING AND WELL REPLACEMENT

(40 CFR 265.117(a)(1))

A. Groundwater Monitoring

★

   a. Number of wells
      i. From cost estimate _____
      ii. From post-closure plan _____
☐   iii. From visual inspection _____

Does Not Apply	Applies	
	Included	Not Included

b. Unit cost for groundwater monitoring ($/well/year)
   i. From cost estimate _____

c. Groundwater monitoring cost ($/year)
   i. From cost estimate _____

B. Well Replacement

a. Average annual number of well replacements
   i. From cost estimate _____
   ii. From post-closure plan _____
□ iii. Inspector's estimate _____

b. Unit cost for well replacement ($/replacement)
   i. From cost estimate _____

c. Cost for well replacement ($/year)
   i. From cost estimate _____

C. Total groundwater monitoring and well replacement cost ($/year)*
   a. From cost estimate _____

6. MAINTAINING AND REPLACING FENCES

(40 CFR 265.117(b); 265.14(b)(2)(i))

★

A. Maintaining Fences

a. Length of fence required (yd)
   i. From cost estimate _____
   ii. From post-closure plan _____
□ iii. From visual inspection _____

*Note in comment section whether well replacement component is on annual basis or not.

Does Not Apply	Applies	
	Included	Not Included

b. Unit cost for maintaining fences ($/yd)
   i. From cost estimate _____

c. Cost for maintaining fences ($/year)
   i. From cost estimate _____

B. Replacing Fences

a. Length of fence to be replaced annually* (yd)
   i. From cost estimate _____
   ii. From post-closure plan _____
□ iii. Inspector's estimate _____

b. Unit cost for fence replacement ($/yd)
   i. From cost estimate _____

c. Cost of fence replacement ($/year)
   i. From cost estimate _____

C. Total Maintaining and Replacing Fences Cost ($/year)**

a. From cost estimate _____

7. COLLECTING, REMOVING AND TREATING LEACHATE

A. Amount of leachate collected (gal./year)

a. From cost estimate _____
b. From post-closure plan _____

(40 CFR 265.310(d)(2))

★

*Total length of fence to be replaced over the entire post-closure period divided by 30 to obtain an annual average.

**Note in comment section whether fence replacement component is on annual basis or not.

Does Not Apply	Applies	
	Included	Not Included

B. Off Site Disposal

a. Amount of leachate removed to off site disposal facility (gal./year)
   i. From cost estimate _____
   ii. From post-closure plan _____

b. Unit cost for off site leachate disposal ($/gal.)
   i. From cost estimate _____

c. Unit cost for transport of leachate ($/gal./mile)
   i. From cost estimate. _____

d. Transport distance (miles)
   i. From cost estimate _____
   ii. From post-closure plan _____
   iii. By map reference _____

e. Cost of transport ($/year)
   i. From cost estimate _____

f. Total cost of off-site treatment/ disposal of leachate ($/year)
   i. From cost estimate _____

C. On Site Disposal

a. Amount of leachate disposed of on-site (gal.)
   i. From cost estimate _____
   ii. From post-closure plan _____

b. Unit cost of on site leachate disposal ($/gal.)
   i. From cost estimate _____

c. Cost of on-site leachate disposal ($/year)
   i. From cost estimate _____

Does Not Apply	Applies	
	Included	Not Included

D. Total Collecting, Removing, Treating and Disposal of Leachate Cost ($)
   a. From cost estimate _____

8. Administrative

A. Hours of management time required to administer the post-closure plan (hrs/year)
   a. From cost estimate _____
   b. From post-closure plan _____
   c. Inspector's estimate _____

B. Unit cost for management time* ($/hr)
   a. From cost estimate _____

C. Total administrative cost ($/year)
   a. From cost estimate _____

9. Other (specify) ($/year) _____

(40 CFR 265.119) ★
(40 CFR 265.120) ★

A. Local land authority notice ($/year) _____
B. Notice in deed ($/year) _____
C. _____ _____
D. _____ _____
E. _____ _____
(Total Other) _____

10. Total Annual Post-Closure Costs ($) _____

a. From cost estimate _____

*Loaded with costs for support personnel.

COMMENTS

INTERIM STATUS COMPLIANCE CHECKLIST

FACILITY Koppers Chemicals
LOCATION Tie Plant ; Greenville Co
DATE 4/26/84.
INSPECTORS John Herrmann.

Met with Ray Burdow - Plant Supt.
Charles Bush - Corporate.

Spill - 2/29/84 to Bob Rogers.
Inhibited system in cylinder.
contained on site.
Scraped with sawdust - Burned in boiler.

In compliance - Yes
Not in compliance - No
Not applicable - NA

REQUIREMENT	Yes	No	N/A	COMMENTS
SUBPART B - GENERAL FACILITY STANDARDS				
265.12 Required Notices				
a) The facility owner or operator must notify the Director at least four weeks in advance of receipt of wastes from a foreign source.			✓	
b) Before transferring ownership or operation of a facility, the facility's owner or operator must notify the new owner or operator of the requirements of 40 CFR 265 and 122.			✓	Koppers has owned this facility since 1930's - Plant originally built in 1903.
265.13 General Waste Analysis				
Before treating, storing, or disposing of haardous waste, the facility owner or operator must obtain a detailed chemical and physical analysis of wastes. The analysis must contain all the information which must be known to treat, store, or dispose the waste in accordance with the federal requirements.	✓			Waste Analysis Plan on file. No Waste analysis for onsite material + wastes.
265.14 Security to Prevent Unknowing and Unauthorized Access to the Facility				
a) The owner or operator must prevent the unknowing entry and minimize the possibility for unauthorized entry unless:	✓			Fence around impoundment. Controlled entry at main gate?
1) physical contact with the waste, structures, or equipment will not be injurious				Records of inspections do not cover security.
2) disturbance of the waste or equipment will not violate the requirements of Part 265				

REQUIREMENT	Not in compliance – No Not applicable – NA Yes	No	N/A	COMMENTS
265.14 – Continued				
b) Unless exempt under 265.14 (a)(1) or 402.7-14(a)(2), a facility must have:				
1) a 24-hour surveillance system				
2) (i) an artificial or natural barrier which completely surrounds the active portion of the facility	✓			
(ii) a means to control entry	✓			
c) A sign warning of the danger of intruding into the facility.				No sign near storage area – Sign near incinerant.
265.15 Inspection and Monitoring				
a) The owner or operator must inspect the facility for malfunctions and deterioration, operator errors, or discharges which may be causing or lead to release of hazardous waste constituents to the environment or a threat to human health.	✓			weekly inspection of containers.
b) The owner or operator must develop and follow a schedule and plan for inspections.	✓			daily inspection of freeboard. weekly for dike.
c) The owner or operator must take remedial action upon the detection of malfunction or the deterioration of equipment and structures when a hazard is imminent.	✓			current 24" freeboard.
d) The owner or operator must record inspections in an inspection log and must keep the records for at least three years from the date of inspection.	✓			

REQUIREMENT	Not in compliance - No Not applicable - NA Yes	No	N/A	COMMENTS
265.16 Facility Personnel Training				
a) Facility personnel must successfully complete a program of classroom instruction or on-the-job training that teaches them to perform their duties in a way that ensures the facility's compliance with the requirements of Part 265.	✓			Last training completed 9/19/83.
b) The training program must be completed within six months of the effective date of Part 265.	✓			
c) There must be an annual review of the initial training in (a) above.	✓			
d) The owner or operator must maintain records of training.	✓			
e) Training records on current personnel must be kept until closure of the facility.	✓			
265.17 General Requirements for Ignitable, Reactive or Incompatible Wastes				
a) The owner or operator must take precautions to prevent accidental ignition or reaction of ignitable or reactive waste.				F.P. ≈ 160 - 200°F.
b) Treatment, storage, or disposal of ignitable or reactive waste and the mixture or commingling of incompatible wastes must be conducted so that it does not:				
1) Generate extreme heat or pressure, fire or explosion, or violent reaction;				
2) Produce uncontrolled toxic mists, fumes, dusts, or gases in sufficient				

REQUIREMENT.	Not in compliance - No Not applicable - NA Yes	No	N/A	COMMENTS
265.17 - Continued-- quantities to threaten human health; 3) Produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosions; 4) Damage the structural integrity of the device or facility containing waste; or 5) Through other like means threaten human health or the environment.			✓	
SUBPART C - PREPAREDNESS AND PREVENTION Pursuant to 265.30 through 265.37, facilities must be maintained and operated for and prevention of releases of hazardous wastes controlled by the State.	✓			Fire hydrants with sufficient water is available Fire truck with extinguishing equipment available.
SUBPART D - CONTINGENCY PLANS Pursuant to 265.56, facilities must have contingency plans and emergency procedures to be followed in the event of a release hazardous waste.	✓			
SUBPART E - MANIFEST SYSTEM, RECORDKEEPING, AND REPORTING 265.71(a)(1-5) If a facility receives hazardous waste accompanied by a manifest, the owner or operator must meet the requirements of 265.71(a)(1-5)	✓			Waste received from New Hampshire (no manifest records) and Arkansas - manifests from 8/83 and 1/84. X
265.71(b)(1-5) If a facility receives, from a rail or water transporter, hazardous waste which is accompanied by a shipping paper, the owner or operator must meet the requirements of 265.71.			✓	All waste by truck.

In compliance - Yes
Not in compliance - No
Not applicable - NA

REQUIREMENT	Yes	No	N/A	COMMENTS
265.72(a) Upon discovery of significant manifest discrepancy, the owner or operator must attempt to reconcile the discrepancy with the waste generator or transporter.	✓			
(b) If a significant manifest discrepancy is not resolved, the owner or operator must notify the Director.	✓			
265.73(b) The owner or operator must keep a written operating record at the facility which meets the requirements of 265.73(b).	✓			Operating record reviewed.
265.74(a) All records must be furnished upon request and available at all times for inspection by the Director or EPA.	✓			
(c) A copy of records of waste disposal locations and quantities must be submitted to the Director and the local land authority upon closure of the facility.			✓	Waste is fed to boiler. Rate of feeding is monitored but X records are not kept in record. (Recorded in a different area)
265.75 The owner or operator must submit an annual report to the Director in compliance with the requirements of 265.75.		✓		Annual report not submitted for CY 83. Reports not kept in record. X
265.76 The receipt of any unmanifested waste must be reported to the Director.	✓			
265.77 The owner or operator must submit a report to the Director if any of the following occur: a) releases, fires, explosions b) groundwater contamination c) facility closure.				Report submitted to Bob Rojas. No record made in operating record. X

In compliance - Yes
Not in compliance - No
Not applicable - NA

REQUIREMENT.	Yes	No	N/A	COMMENTS
SUBPART F - GROUNDWATER MONITORING				
265.90 Owner or operator must implement a groundwater monitoring program capable of determining the facility's impact on the quality of the upper aquifer within one year of the effective date of 265.90.	✓			Some question about location of upgradient well. Downgradient wells not located at compliance point.
265.91 - 265.94 The owner and operator must install, operate, and maintain a groundwater monitoring system which meets the requirements of 265.91 - 265.94.				Methods of analysis? Replicates - 3 statistical samples? Comparison of wells to background (265.93(b)) Well ~~[illegible]~~ installed in '82.
265.90(c) All of the groundwater monitoring requirements may be waived if the owner or operator can demonstrate that there is a low potential for migration of hazardous waste constituents from the facility via the uppermost aquifer below the facility to water supply wells or to surface water.			✓	
SUBPART G - CLOSURE AND POST-CLOSURE				
265.111 The owner or operator must close his facility in a manner that: 1) minimizes the need for future maintenance, and 2) controls, minimizes, or eliminates post-closure escape of hazardous waste.				Closure plan updated in Jan 84. Update not in existing record. X Closure plan comments made in Ref Bowman.
265.112(a) The owner or operator must have a written closure plan on the effective date of Part 265.				

In compliance - Yes
Not in compliance - No
Not applicable - NA

REQUIREMENT.	Yes	No	N/A	COMMENTS
265:112(a) Continued-- The closure plan must include: 1) A description of how and when the facility will be partially closed, if applicable, and ultimately closed. 2) An estimate of the maximum inventory of wastes in storage or treatment at any given time. 3) Steps to decontaminate facility equipment. 4) A schedule for final closure which must include, as a minimum, anticipated dates when wastes will no longer be received, anticipated date for completion of final closure, and intervening milestone dates.				
265.113(a) Closure must be initiated within 90 days after receiving the final volume of hazardous wastes. (b) The owner or operator must complete closure activities within six months after receiving the final volume of wastes.				
265.114 Upon completion of closure, all equipment and structures must be properly disposed of or decontaminated.				
265.115 The owner or operator and an independent registered professional engineer must certify that the facility has been closed in accordance with the approved closure plan.				

In compliance - Yes
Not in compliance - No
Not applicable - NA

REQUIREMENT	Yes	No	N/A	COMMENTS
265.117(a) Post closure care must consist of at least:				
1) Groundwater monitoring				
2) Maintenance of the contaminant system.				
The owner or operator must have a post-closure plan on the effective date of Part 265 and it must include:				
1) Groundwater monitoring activities and frequency.				
2) Maintenance activities and frequencies to ensure the integrity of the cap, final cover, or other containment structures, and functions of the facilities monitoring equipment.				
265.119 Within 90 days after closure, the owner or operator must submit a survey plat of the facility.				
265.120 The owner or operator must record a notice on the deed that the land has been used to manage hazardous waste.				
SUBPART H - FINANCIAL REQUIREMENTS				
265.142(a) The owner or operator must develop and maintain a current estimate of closure and post-closure costs.	✓			Financial mechanism reviewed 4/16. Comments sent - facility uses Financial Test.
SUBPART I - OTHER FACILITY STANDARDS				
265.170 - 265.172 The container must be compatible with the waste to be stored.	✓			Metal containers Labelled ORM-E from Arkansas facility One drum appears to be or have leaked around

REQUIREMENT	Not in compliance - No Not applicable - NA Yes	No	N/A	COMMENTS
265.173 Containers holding hazardous waste must be kept closed and must not be opened, handled, or stored in a manner which may cause a rupture or leak.	✓			However 2 drums were open with some rainwater & sludge - supposedly interest; no markings on drums.
265.174 Areas where containers are stored must be inspected weekly.				No signs of leakage.
265.176 Containers holding ignitable or reactive waste must be located at least 15 meters from the facility's property line.			✓	
265.177(a) Incompatible wastes must not be placed in the same container.	✓			No secondary containment around storage area. However no signs of run off from site. Drums are placed on storage pads.
(b) A storage container holding a hazardous waste that is incompatible with any waste or other materials stored nearby must be separated or protected from the other materials.			✓	Storage building to be built.
SUBPART J - TANKS				
265.192(b) Hazardous waste must be placed in a tank if they could cause the tank or its liner to leak.				Tanks not included on Part A. API separator tank & flocculation separator tanks need to be identified - should be included in Part B.
(c) Uncovered tanks must have a least two feet of freeboard unless other containment structures, a drainage control system, or other diversion structures with a capacity that equals or exceeds the volume of the top two feet of the tank.	✓			Uncovered tanks - have sufficient freeboard but should be included on facility checklist.
(d) Tanks which have a continuous feed system must be equipped with a means to stop the inflow.			✓	Overflow goes to impoundment.

Not in compliance - NC
Not applicable - NA

REQUIREMENT	Yes	No	N/A	COMMENTS
265.193 Waste analysis must be conducted pursuant to 265.13, and 265.193(a).				Waste analysis not being done routinely.
265.194 Tanks must be inspected in accordance with 265.194.		✓		
265.197 At closure, all hazardous waste and hazardous waste residues must be removed from the tanks.		✓		
265.198 Ignitable or reactive waste should not be placed in a tank unless 265.198 is complied with.			✓	
265.199 Incompatible wastes must not be placed in the same tank unless 265.176 is complied with.			✓	
SUBPART K - SURFACE IMPOUNDMENTS				Cooling pond - some surface combustible not sampled.
265.222 Must maintain at least two feet of freeboard.	✓			
265.223 Earthen dikes must have protective cover.	✓			Some areas have dust only.
265.225 Must conduct waste analyses and trial tests in accordance with 265.225.		✓		Waste analysis not being done - no records not on site analysis.
265.226(1) Must inspect the freeboard level at least once each operating day.	✓			
(2) Must inspect the surface impoundment at least once a week to detect any leaks, deterioration, or failure.	✓			weekly.
265.228 The surface impoundment must close in accordance with 265.228.	✓			Closure plan submitted with Part B.

REQUIREMENT	Not applicable - NA			COMMENTS
	Yes	No	N/A	
265.229 Ignitable or reactive waste must not be placed in a surface impoundment unless 265.229 is complied with.			✓	
265.230 Incompatible wastes must not be placed in the same surface impoundment unless 265.17(b) is complied with.			✓	
SUBPART L - WASTE PILES				
265.251 A waste pile must be protected and managed to control wind dispersal.				
265.252 An owner or operator must conduct waste analyses unless the facility meets the exemptions of 265.252.				
265.253 Within one year after the effective date of the regulations, leachate or run-off from a pile must be controlled pursuant to 265.253.				
265.256 Ignitable or reactive waste must not be placed in a waste site unless 265.256 is complied with.				
265.257 The requirements of 265.257 for incompatible wastes must be complied with.				
SUBPART M - LAND TREATMENT				
265.272(a) Hazardous waste must not be placed at a land treatment facility unless it can be made less hazardous or non-hazardous.				No significant build-up of sludge. However oil sheen is apparent in places. Runoff is controlled by dike. Runoff near toe of dike in some areas. Runoff controlled by manual pumping
(b) Run-on must be diverted away from other active portions as of one year after the effective date of Part 265.				

Not in compliance - No
Not applicable - NA

REQUIREMENT	Yes	No	N/A	COMMENTS
265.272 -- Continued (c) Run-off from active portions must be collected as of one year after the effective date of Part 265 ...	✓			
265.273 Waste analyses must be conducted pursuant to 265.273.		✓		
265.276(a) An owner or operator must notify the State Director within 60 days after the effective date of Part 265 if food chain crops are grown on the land treatment facility.				
(b) Food chain crops must not be grown on the treated area of a hazardous waste land treatment facility unless 265.276(b) is complied with.				
(c) Food chain crops must not be grown on a land treatment facility receiving waste that contains cadmium unless 265.276(c) is complied with.				
265.278 The owner or operator must have in writing and must implement an unsaturated zone monitoring plan pursuant to 265.278.		✓		
265.279 The owner or operator must keep records of the application dates, application rates, quantities, and location of each hazardous waste placed in a facility.		✓		Rates are monitored by pumping at 15 min intervals - pump approx 100 gpm.
265.280 A land treatment facility must meet the closure and post-closure requirements of 265.280.		✓		Land treatment facility not included on Part A or Part B.

In compliance - Yes
Not in compliance - No
Not applicable - NA

REQUIREMENT	Yes	No	N/A	COMMENTS
265.281 Ignitable or reactive waste must not be placed in a land treatment facility unless 265.281 is complied with.			✓	
265.282 Incompatible wastes must not be placed in the same land treatment area unless 265.17(b) is complied with.			✓	
SUBPART N - LANDFILLS				
265.302(a) Run-on must be diverted away from the active portions within one year after the effective date of Part 265.				
(b) Run-off from active portions must be collected within one year after the effective date of Part 265.				
(d) Must control wind dispersal.				
265.309 The owner or operator must meet the surveying and recordkeeping requirements of 265.309.				
265.310 A landfill must comply with closure and post-closure requirements of 265.310.				
265.312 Ignitable or reactive waste must not be placed in a landfill unless 265.312 is complied with.				
265.313 Incompatible wastes must not be placed in a landfill unless 265.17(b) is complied with.				
265.314 Bulk or non-containerized liquid waste, waste containing free-liquids, or containers holding liquid waste should not be placed in a landfill unless the requirements of 265.314				

REQUIREMENT	Not applicable - NA			COMMENTS
	Yes	No	N/A	
265.315 (i) Empty containers must be reduced in volume as of one year after the effective date of Part 265.			/	
SUBPART O - INCINERATORS				
265.343 Must be at steady state conditions before adding hazardous waste.			?	Boiler takes in creosote from off site and paste/creosote waste from on site. Mixed with bark & burned - Creosote wells to be analyzed on program for Btu value.
265.345 Waste analyses must be conducted pursuant to 265.345.				
265.347 Monitoring and inspections must be conducted as delineated in 265.347.				
265.351 At closure, the owner or operator must remove all hazardous waste and hazardous waste residues.				
SUBPART P - THERMAL TREATMENT			?	
265.373 Must be at steady state conditions before adding hazardous wastes.				
265.375 Waste analyses must be conducted pursuant to 265.375.				
265.377 Monitoring and inspections must be conducted as delineated in 265.377.				
265.301 At closure, the owner or operator must remove all hazardous waste residues.				
265.382 Open burning of hazardous waste is prohibited except for the open burning and detonation of waste explosives.				

REQUIREMENT	Not applicable - NA			COMMENTS
	Yes	No	N/A	
SUBPART Q - CHEMICAL, PHYSICAL, AND BIOLOGICAL TREATMENT				
265.401(a) Must comply with 265.17(b)				
(b) Hazardous waste must not be placed in the treatment process or equipment if any failure of equipment or the process would occur.				
(c) A continuously-fed process must be equipped with a means to stop the inflow.				
265.402 Waste analyses and trial tests must be conducted pursuant to 265.402.				
265.403 Inspections must be made pursuant to 265.403.				
265.404 At closure, all hazardous waste and hazardous waste residues must be removed.				
265.405 Ignitable or reactive waste must not be placed in a treatment process unless 265.405 is complied with.				
265.406 Incompatible wastes must not be placed in the same treatment process unless 265.17(b) is complied with.				
SUBPART R - UNDERGROUND INJECTION				
265.430(a) underground injection of hazardous waste is not subject to the closure and post-closure or financial requirements of Part 265. Underground injection is subject to the other requirements of Part 265.				

REQUIREMENT	Of Compliance No Not applicable - NA Yes	 No	 N/A	COMMENTS
Other questions or standards.				
Are there any other generators transporting their waste to this hazardous waste management facility?	✓			Kimmins - AK. Kimmins - NA.

Ray Barlow
ph. 226-4584

Box 160
Tie Plant 38560

INTERIM STATUS COMPLIANCE CHECKLIST

FACILITY Koppers
LOCATION Tie Plant
DATE 7/20/83
INSPECTORS Bob Lee
Fred Hall

REQUIREMENT	Not in compliance - No Not applicable - NA Yes	No	N/A	COMMENTS
SUBPART B - GENERAL FACILITY STANDARDS				
265.12 Required Notices				
a) The facility owner or operator must notify the Director at least four weeks in advance of receipt of wastes from a foreign source.				
b) Before transferring ownership or operation of a facility, the facility's owner or operator must notify the new owner or operator of the requirements of 40 CFR 265 and 122.				
265.13 General Waste Analysis				
Before treating, storing, or disposing of haardous waste, the facility owner or operator must obtain a detailed chemical and physical analysis of wastes. The analysis must contain all the information which must be known to treat, store, or dispose the waste in accordance with the federal requirements.	✓			
265.14 Security to Prevent Unknowing and Unauthorized Access to the Facility				
a) The owner or operator must prevent the unknowing entry and minimize the possibility for unauthorized entry unless:	✓			
1) physical contact with the waste, structures, or equipment will not be injurious				
2) disturbance of the waste or equipment will not violate the requirements of Part 265				

REQUIREMENT	Not applicable - NA			COMMENTS
	Yes	No	N/A	
265.14 - Continued				
b) Unless exempt under 265.14 (a)(1) or 402.7-14(a)(2), a facility must have:				
1) a 24-hour surveillance system				
2) (i) an artificial or natural barrier which completely surrounds the active portion of the facility	✓			
(ii) a means to control entry				
c) A sign warning of the danger of intruding into the facility.	✓			
265.15 Inspection and Monitoring				
a) The owner or operator must inspect the facility for malfunctions and deterioration, operator errors, or discharges which may be causing or lead to release of hazardous waste constituents to the environment or a threat to human health.	✓			
b) The owner or operator must develop and follow a schedule and plan for inspections.	✓			
c) The owner or operator must take remedial action upon the detection of malfunction or the deterioration of equipment and structures when a hazard is imminent.	✓			
d) The owner or operator must record inspections in an inspection log and must keep the records for at least three years from the date of inspection.	✓			

REQUIREMENT	Not applicable - NA			COMMENTS
	Yes	No	N/A	
265.16 Facility Personnel Training				
a) Facility personnel must successfully complete a program of classroom instruction or on-the-job training that teaches them to perform their duties in a way that ensures the facility's compliance with the requirements of Part 265.	✓			
b) The training program must be completed within six months of the effective date of Part 265.	✓			
c) There must be an annual review of the initial training in (a) above.		✓		Last conducted on March 3, 1982
d) The owner or operator must maintain records of training.	✓			
e) Training records on current personnel must be kept until closure of the facility.	✓			
265.17 General Requirements for Ignitable, Reactive or Incompatible Wastes				
a) The owner or operator must take precautions to prevent accidental ignition or reaction of ignitable or reactive waste.			✓	
b) Treatment, storage, or disposal of ignitable or reactive waste and the mixture or commingling of incompatible wastes must be conducted so that it does not:				
1) Generate extreme heat or pressure, fire or explosion, or violent reaction;				
2) Produce uncontrolled toxic mists, fumes, dusts, or gases in sufficient				

REQUIREMENT	Not in compliance - NC / Not applicable - NA			COMMENTS
	Yes	No	N/A	
265.17 - Continued-- quantities to threaten human health; 3) Produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosions; 4) Damage the structural integrity of the device or facility containing waste; or 5) Through other like means threaten human health or the environment.				
SUBPART C - PREPAREDNESS AND PREVENTION Pursuant to 265.30 through 265.37, facilities must be maintained and operated for and prevention of releases of hazardous waste controlled by the State.	✓			
SUBPART D - CONTINGENCY PLANS Pursuant to 265.56, facilities must have contingency plans and emergency procedures to be followed in the event of a release of hazardous waste.	✓			Emergency Co-ordinator must have the authority to commit resources to carry out the plan.
SUBPART E - MANIFEST SYSTEM, RECORDKEEPING, AND REPORTING 265.71(a)(1-5) If a facility receives hazardous waste accompanied by a manifest, the owner or operator must meet the requirements of 265.71(a)(1-5) 265.71(b)(1-5) If a facility receives, from a rail or water transporter, hazardous waste which is accompanied by a shipping paper, the owner or operator must meet the requirements of 265.71.			✓	

In compliance - Yes
Not in compliance - No
Not applicable - NA

REQUIREMENT	Yes	No	N/A	COMMENTS
265.72(a) Upon discovery of significant manifest discrepancy, the owner or operator must attempt to reconcile the discrepancy with the waste generator or transporter.				
(b) If a significant manifest discrepancy is not resolved, the owner or operator must notify the Director.				
265.73(b) The owner or operator must keep a written operating record at the facility which meets the requirements of 265.73(b).	✓			
265.74(a) All records must be furnished upon request and available at all times for inspection by the Director or EPA.	✓			
(c) A copy of records of waste disposal locations and quantities must be submitted to the Director and the local land authority upon closure of the facility.				
265.75 The owner or operator must submit an annual report to the Director in compliance with the requirements of 265.75.	✓			
265.76 The receipt of any unmanifested waste must be reported to the Director.				
265.77 The owner or operator must submit a report to the Director if any of the following occur: a) releases, fires, explosions b) groundwater contamination c) facility closure.				

REQUIREMENT	Not in compliance - No Not applicable - NA Yes	No	N/A	COMMENTS
SUBPART F - GROUNDWATER MONITORING				
265.90 Owner or operator must implement a groundwater monitoring program capable of determining the facility's impact on the quality of the upper aquifer within one year of the effective date of 265.90.				
265.91 - 265.94 The owner and operator must install, operate, and maintain a groundwater monitoring system which meets the requirements of 265.91 - 265.94.				
265.90(c) All of the groundwater monitoring requirements may be waived if the owner or operator can demonstrate that there is a low potential for migration of hazardous waste constituents from the facility via the uppermost aquifer below the facility to water supply wells or to surface water.				
SUBPART G - CLOSURE AND POST-CLOSURE				
265.111 The owner or operator must close his facility in a manner that:	✓			
1) minimizes the need for future maintenance, and	✓			
2) controls, minimizes, or eliminates post-closure escape of hazardous waste.	✓			
265.112(a) The owner or operator must have a written closure plan on the effective date of Part 265.	✓			

REQUIREMENT	Not in compliance - No Not applicable - NA Yes	No	N/A	COMMENTS
265.112(a) Continued-- The closure plan must include: 1) A description of how and when the facility will be partially closed, if applicable, and ultimately closed.		✓		
2) An estimate of the maximum inventory of wastes in storage or treatment at any given time.	✓			
3) Steps to decontaminate facility equipment.		✓		
4) A schedule for final closure which must include, as a minimum, anticipated dates when wastes will no longer be received, anticipated date for completion of final closure, and intervening milestone dates.		✓		
265.113(a) Closure must be initiated within 90 days after receiving the final volume of hazardous wastes.				
(b) The owner or operator must complete closure activities within six months after receiving the final volume of wastes.				
265.114 Upon completion of closure, all equipment and structures must be properly disposed of or decontaminated.				
265.115 The owner or operator and an independent registered professional engineer must certify that the facility has been closed in accordance with the approved closure plan.	✓			

REQUIREMENT	Not in compliance - No Not applicable - NA Yes	No	N/A	COMMENTS
265.117(a) Post closure care must consist of at least: 1) Groundwater monitoring 2) Maintenance of the contaminant system. The owner or operator must have a post-closure plan on the effective date of Part 265 and it must include: 1) Groundwater monitoring activities and frequency. 2) Maintenance activities and frequencies to ensure the integrity of the cap, final cover, or other containment structures, and functions of the facilities monitoring equipment.				
265.119 Within 90 days after closure, the owner or operator must submit a survey plat of the facility.				
265.120 The owner or operator must record a notice on the deed that the land has been used to manage hazardous waste.				
SUBPART H - FINANCIAL REQUIREMENTS				
265.142(a) The owner or operator must develop and maintain a current estimate of closure and post-closure costs.	✓			
SUBPART I - OTHER FACILITY STANDARDS				
265.170 - 265.172 The container must be compatible with the waste to be stored.				

REQUIREMENT	Not applicable - NA			COMMENTS
	Yes	No	N/A	
265.173 Containers holding hazardous waste must be kept closed and must not be opened, handled, or stored in a manner which may cause a rupture or leak.				
265.174 Areas where containers are stored must be inspected weekly.				
265.176 Containers holding ignitable or reactive waste must be located at least 15 meters from the facility's property line.				
265.177(a) Incompatible wastes must not be placed in the same container.				
(b) A storage container holding a hazardous waste that is incompatible with any waste or other materials stored nearby must be separated or protected from the other materials.				
SUBPART J - TANKS				
265.192(b) Hazardous waste must be placed in a tank if they could cause the tank or its liner to leak.				
(c) Uncovered tanks must have a least two feet of freeboard unless other containment structures, a drainage control system, or other diversion structures with a capacity that equals or exceeds the volume of the top two feet of the tank.				
(d) Tanks which have a continuous feed system must be equipped with a means to stop the inflow.				

REQUIREMENT	Not applicable - NA			COMMENTS
	Yes	No	N/A	
265.193 Waste analysis must be conducted pursuant to 265.13, and 265.193(a).				
265.194 Tanks must be inspected in accordance with 265.194.				
265.197 At closure, all hazardous waste and hazardous waste residues must be removed from the tanks.				
265.198 Ignitable or reactive waste should not be placed in a tank unless 265.198 is complied with.				
265.199 Incompatible wastes must not be placed in the same tank unless 265.176 is complied with.				
SUBPART K - SURFACE IMPOUNDMENTS				
265.222 Must maintain at least two feet of freeboard.	✓			
265.223 Earthen dikes must have protective cover.	✓			
265.225 Must conduct waste analyses and trial tests in accordance with 265.225.	✓			
265.226(1) Must inspect the freeboard level at least once each operating day.	✓			
(2) Must inspect the surface impoundment at least once a week to detect any leaks, deterioration, or failure.	✓			
265.228 The surface impoundment must close in accordance with 265.228.				

REQUIREMENT	Not applicable - NA			COMMENTS
	Yes	No	N/A	
265.229 Ignitable or reactive waste must not be placed in a surface impoundment unless 265.229 is complied with.				
265.230 Incompatible wastes must not be placed in the same surface impoundment unless 265.17(b) is complied with.				
SUBPART L - WASTE PILES				
265.251 A waste pile must be protected and managed to control wind dispersal.				
265.252 An owner or operator must conduct waste analyses unless the facility meets the exemptions of 265.252.				
265.253 Within one year after the effective date of the regulations, leachate or run-off from a pile must be controlled pursuant to 265.253.				
265.256 Ignitable or reactive waste must not be placed in a waste site unless 265.256 is complied with.				
265.257 The requirements of 265.257 for incompatible wastes must be complied with.				
SUBPART M - LAND TREATMENT				
265.272(a) Hazardous waste must not be placed at a land treatment facility unless it can be made less hazardous or non-hazardous.				
(b) Run-on must be diverted away from other active portions as of one year after the effective date of Part 265.				

REQUIREMENT	Not applicable - NA			COMMENTS
	Yes	No	N/A	
265.272 -- Continued (c) Run-off from active portions must be collected as of one year after the effective date of Part 265				
265.273 Waste analyses must be conducted pursuant to 265.273.				
265.276(a) An owner or operator must notify the State Director within 60 days after the effective date of Part 265 if food chain crops are grown on the land treatment facility.				
(b) Food chain crops must not be grown on the treated area of a hazardous waste land treatment facility unless 265.276(b) is complied with.				
(c) Food chain crops must not be grown on a land treatment facility receiving waste that contains cadmium unless 265.276(c) is complied with.				
265.278 The owner or operator must have in writing and must implement an unsaturated zone monitoring plan pursuant to 265.278.				
265.279 The owner or operator must keep records of the application dates, application rates, quantities, and location of each hazardous waste placed in a facility.				
265.280 A land treatment facility must meet the closure and post-closure requirements of 265.280.				

REQUIREMENT	Not in compliance - No Not applicable - NA Yes	No	N/A	COMMENTS
265.281 Ignitable or reactive waste must not be placed in a land treatment facility unless 265.281 is complied with.				
265.282 Incompatible wastes must not be placed in the same land treatment area unless 265.17(b) is complied with.				
SUBPART N - LANDFILLS				
265.302(a) Run-on must be diverted away from the active portions within one year after the effective date of Part 265.				
(b) Run-off from active portions must be collected within one year after the effective date of Part 265.				
(d) Must control wind dispersal.				
265.309 The owner or operator must meet the surveying and recordkeeping requirements of 265.309.				
265.310 A landfill must comply with closure and post-closure requirements of 265.310.				
265.312 Ignitable or reactive waste must not be placed in a landfill unless 265.312 is complied with.				
265.313 Incompatible wastes must not be placed in a landfill unless 265.17(b) is complied with.				
265.314 Bulk or non-containerized liquid waste, waste containing free-liquids, or containers holding liquid waste should not be placed in a landfill unless the requirements of 265.314				

REQUIREMENT	Not Applicable			COMMENTS
	Yes	No	N/A	
265.315 (i) Empty containers must be reduced in volume as of one year after the effective date of Part 265.				
SUBPART O - INCINERATORS				
265.343 Must be at steady state conditions before adding hazardous waste.				
265.345 Waste analyses must be conducted pursuant to 265.345.				
265.347 Monitoring and inspections must be conducted as delineated in 265.347.				
265.351 At closure, the owner or operator must remove all hazardous waste and hazardous waste residues.				
SUBPART P - THERMAL TREATMENT				
265.373 Must be at steady state conditions before adding hazardous wastes.				
265.375 Waste analyses must be conducted pursuant to 265.375.				
265.377 Monitoring and inspections must be conducted as delineated in 265.377.				
265.301 At closure, the owner or operator must remove all hazardous waste residues.				
265.382 Open burning of hazardous waste is prohibited except for the open burning and detonation of waste explosives.				

REQUIREMENT	Not applicable - NA			COMMENTS
	Yes	No	N/A	
SUBPART Q - CHEMICAL, PHYSICAL, AND BIOLOGICAL TREATMENT				
265.401(a) Must comply with 265. 17(b)				
(b) Hazardous waste must not be placed in the treatment process or equipment if any failure of equipment or the process would occur.				
(c) A continuously-fed process must be equipped with a means to stop the inflow.				
265.402 Waste analyses and trial tests must be conducted pursuant to 265. 402.				
265.403 Inspections must be made pursuant to 265.403.				
265.404 At closure, all hazardous waste and hazardous waste residues must be removed.				
265.405 Ignitable or reactive waste must not be placed in a treatment process unless 265.405 is complied with.				
265.406 Incompatible wastes must not be placed in the same treatment process unless 265.17(b) is complied with.				
SUBPART R - UNDERGROUND INJECTION				
265.430(a) underground injection of hazardous waste is not subject to the closure and post-closure or financial requirements of Part 265. Underground injection is subject to the other requirements of Part 265.				

REQUIREMENT	Not applicable - NA			COMMENTS
	Yes	No	N/A	
Other questions or standards.				
Are there any other generators transporting their waste to this hazardous waste management facility?				

INTERIM STATUS COMPLIANCE CHECKLIST

FACILITY Koppers - Tie Plant
LOCATION Tie Plant
DATE 4/20/82
INSPECTORS Bob Lee

Ray Bartlow

In compliance? - Yes
Not in compliance - No
Not applicable - NA

REQUIREMENT	Yes	No	N/A	COMMENTS
SUBPART B - GENERAL FACILITY STANDARDS				
265.12 Required Notices			✓	
a) The facility owner or operator must notify the Director at least four weeks in advance of receipt of wastes from a foreign source.				
b) Before transferring ownership or operation of a facility, the facility's owner or operator must notify the new owner or operator of the requirements of 40 CFR 265 and 122.			✓	
265.13 General Waste Analysis				
Before treating, storing, or disposing of haardous waste, the facility owner or operator must obtain a detailed chemical and physical analysis of wastes. The analysis must contain all the information which must be known to treat, store, or dispose the waste in accordance with the federal requirements.	✓			Declared Waste + has similar Tests run at another facility
265.14 Security to Prevent Unknowing and Unauthorized Access to the Facility				
a) The owner or operator must prevent the unknowing entry and minimize the possibility for unauthorized entry unless:	✓			has fence
1) physical contact with the waste, structures, or equipment will not be injurious				
2) disturbance of the waste or equipment will not violate the requirements of Part 265.				

REQUIREMENT	Not in compliance - No Not applicable - NA Yes	No	N/A	COMMENTS
265.14 - Continued				
b) Unless exempt under 265.14 (a)(1) or 402.7-14(a)(2), a facility must have:				
1) a 24-hour surveillance system				
2) (i) an artificial or natural barrier which completely surrounds the active portion of the facility	✓			
(ii) a means to control entry				
c) A sign warning of the danger of intruding into the facility.	✓			
265.15 Inspection and Monitoring				
a) The owner or operator must inspect the facility for malfunctions and deterioration, operator errors, or discharges which may be causing or lead to release of hazardous waste constituents to the environment or a threat to human health.	✓			
b) The owner or operator must develop and follow a schedule and plan for inspections.	✓			
c) The owner or operator must take remedial action upon the detection of malfunction or the deterioration of equipment and structures when a hazard is imminent.	✓			
d) The owner or operator must record inspections in an inspection log and must keep the records for at least three years from the date of inspection.	✓			

REQUIREMENT	Not in compliance - NO Not applicable - NA Yes	No	N/A	COMMENTS
265.16 Facility Personnel Training				
a) Facility personnel must successfully complete a program of classroom instruction or on-the-job training that teaches them to perform their duties in a way that ensures the facility's compliance with the requirements of Part 265.	✓			
b) The training program must be completed within six months of the effective date of Part 265.	✓			
c) There must be an annual review of the initial training in (a) above.	✓			
d) The owner or operator must maintain records of training.	✓			
e) Training records on current personnel must be kept until closure of the facility.			✓	
265.17 General Requirements for Ignitable, Reactive or Incompatible Wastes				
a) The owner or operator must take precautions to prevent accidental ignition or reaction of ignitable or reactive waste.			✓	
b) Treatment, storage, or disposal of ignitable or reactive waste and the mixture or commingling of incompatible wastes must be conducted so that it does not:			✓	
1) Generate extreme heat or pressure, fire or explosion, or violent reaction;			✓	
2) Produce uncontrolled toxic mists, fumes, dusts, or gases in sufficient			✓	

REQUIREMENT.	Not in compliance - No Not applicable - NA Yes	No	N/A	COMMENTS
265.17 - Continued-- quantities to threaten human health; 3) Produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosions; 4) Damage the structural integrity of the device or facility containing waste; or 5) Through other like means threaten human health or the environment.			✓	
SUBPART C - PREPAREDNESS AND PREVENTION Pursuant to 265.30 through 265.37, facilities must be maintained and operated for and prevention of releases of hazardous wastes controlled by the State.	✓			
SUBPART D - CONTINGENCY PLANS Pursuant to 265.56, facilities must have contingency plans and emergency procedures to be followed in the event of a release of hazardous waste.	✓			
SUBPART E - MANIFEST SYSTEM, RECORDKEEPING, AND REPORTING 265.71(a)(1-5) If a facility receives hazardous waste accompanied by a manifest, the owner or operator must meet the requirements of 265.71(a)(1-5) 265.71(b)(1-5) If a facility receives, from a rail or water transporter, hazardous waste which is accompanied by a shipping paper, the owner or operator must meet the requirements of 265.71.			✓	

In compliance - Yes
Not in compliance - No
Not applicable - NA

REQUIREMENT	Yes	No	N/A	COMMENTS
265.72(a) Upon discovery of significant manifest discrepancy, the owner or operator must attempt to reconcile the discrepancy with the waste generator or transporter.			✓	
(b) If a significant manifest discrepancy is not resolved, the owner or operator must notify the Director.		✓		
265.73(b) The owner or operator must keep a written operating record at the facility which meets the requirements of 265.73(b).	✓			
265.74(a) All records must be furnished upon request and available at all times for inspection by the Director or EPA.	✓			
(c) A copy of records of waste disposal locations and quantities must be submitted to the Director and the local land authority upon closure of the facility.				
265.75 The owner or operator must submit an annual report to the Director in compliance with the requirements of 265.75.			✓	Delayed To Aug. 82
265.76 The receipt of any unmanifested waste must be reported to the Director.				
265.77 The owner or operator must submit a report to the Director if any of the following occur: a) releases, fires, explosions b) groundwater contamination c) facility closure.				

In compliance - Yes
Not in compliance - No
Not applicable - NA

REQUIREMENT.	Yes	No	N/A	COMMENTS
SUBPART F - GROUNDWATER MONITORING				
265.90 Owner or operator must implement a groundwater monitoring program capable of determining the facility's impact on the quality of the upper aquifer within one year of the effective date of 265.90.	✓			Has 4 monitoring wells. Report is due Aug. 82
265.91 - 265.94 The owner and operator must install, operate, and maintain a groundwater monitoring system which meets the requirements of 265.91 - 265.94.	✓			
265.90(c) All of the groundwater monitoring requirements may be waived if the owner or operator can demonstrate that there is a low potential for migration of hazardous waste constituents from the facility via the uppermost aquifer below the facility to water supply wells or to surface water.				
SUBPART G - CLOSURE AND POST-CLOSURE				
265.111 The owner or operator must close his facility in a manner that:				
1) minimizes the need for future maintenance, and				
2) controls, minimizes, or eliminates post-closure escape of hazardous waste.				
265.112(a) The owner or operator must have a written closure plan on the effective date of Part 265.	✓			

In compliance - Yes
Not in compliance - No
Not applicable - NA

REQUIREMENT	Yes	No	N/A	COMMENTS
265.112(a) Continued-- The closure plan must include: 1) A description of how and when the facility will be partially closed, if applicable, and ultimately closed. 2) An estimate of the maximum inventory of wastes in storage or treatment at any given time. 3) Steps to decontaminate facility equipment. 4) A schedule for final closure which must include, as a minimum, anticipated dates when wastes will no longer be received, anticipated date for completion of final closure, and intervening milestone dates.				
265.113(a) Closure must be initiated within 90 days after receiving the final volume of hazardous wastes. (b) The owner or operator must complete closure activities within six months after receiving the final volume of wastes.				
265.114 Upon completion of closure, all equipment and structures must be properly disposed of or decontaminated.				
265.115 The owner or operator and an independent registered professional engineer must certify that the facility has been closed in accordance with the approved closure plan.				

In compliance - Yes
Not in compliance - No
Not applicable - NA

REQUIREMENT	Yes	No	N/A	COMMENTS
265.117(a) Post closure care must consist of at least:				
1) Groundwater monitoring				
2) Maintenance of the contaminant system.				
The owner or operator must have a post-closure plan on the effective date of Part 265 and it must include:				
1) Groundwater monitoring activities and frequency.				
2) Maintenance activities and frequencies to ensure the integrity of the cap, final cover, or other containment structures, and functions of the facilities monitoring equipment.				
265.119 Within 90 days after closure, the owner or operator must submit a survey plat of the facility.				
265.120 The owner or operator must record a notice on the deed that the land has been used to manage hazardous waste.				
SUBPART H - FINANCIAL REQUIREMENTS				
265.142(a) The owner or operator must develop and maintain a current estimate of closure and post-closure costs.	✓			
SUBPART I - OTHER FACILITY STANDARDS				
265.170 - 265.172 The container must be compatible with the waste to be stored.	✓			

REQUIREMENT	Not in compliance - NO Not applicable - NA Yes	No	N/A	COMMENTS
265.173 Containers holding hazardous waste must be kept closed and must not be opened, handled, or stored in a manner which may cause a rupture or leak.	✓			
265.174 Areas where containers are stored must be inspected weekly.	✓			
265.176 Containers holding ignitable or reactive waste must be located at least 15 meters from the facility's property line.	✓			
265.177(a) Incompatible wastes must not be placed in the same container.			✓	
(b) A storage container holding a hazardous waste that is incompatible with any waste or other materials stored nearby must be separated or protected from the other materials.			✓	
SUBPART J - TANKS				
265.192(b) Hazardous waste must be placed in a tank if they could cause the tank or its liner to leak.				
(c) Uncovered tanks must have a least two feet of freeboard unless other containment structures, a drainage control system, or other diversion structures with a capacity that equals or exceeds the volume of the top two feet of the tank.				
(d) Tanks which have a continuous feed system must be equipped with a means to stop the inflow.				

REQUIREMENT	Not applicable - NA			COMMENTS
	Yes	No	N/A	
265.193 Waste analysis must be conducted pursuant to 265.13, and 265.193(a).				
265.194 Tanks must be inspected in accordance with 265.194.				
265.197 At closure, all hazardous waste and hazardous waste residues must be removed from the tanks.				
265.198 Ignitable or reactive waste should not be placed in a tank unless 265.198 is complied with.				
265.199 Incompatible wastes must not be placed in the same tank unless 265.176 is complied with.				
SUBPART K - SURFACE IMPOUNDMENTS				
265.222 Must maintain at least two feet of freeboard.		✓		20" - rainy weather several inches of rain has fallen in the last 2 or 3 days.
265.223 Earthen dikes must have protective cover.	✓			
265.225 Must conduct waste analyses and trial tests in accordance with 265.225.				
265.226(1) Must inspect the freeboard level at least once each operating day.	✓			
(2) Must inspect the surface impoundment at least once a week to detect any leaks, deterioration, or failure.	✓			
265.228 The surface impoundment must close in accordance with 265.228.				

REQUIREMENT	Not applicable - NA			COMMENTS
	Yes	No	N/A	
265.229 Ignitable or reactive waste must not be placed in a surface impoundment unless 265.229 is complied with.				
265.230 Incompatible wastes must not be placed in the same surface impoundment unless 265.17(b) is complied with.				
SUBPART L - WASTE PILES				
265.251 A waste pile must be protected and managed to control wind dispersal.				
265.252 An owner or operator must conduct waste analyses unless the facility meets the exemptions of 265.252.				
265.253 Within one year after the effective date of the regulations, leachate or run-off from a pile must be controlled pursuant to 265.253.				
265.256 Ignitable or reactive waste must not be placed in a waste site unless 265.256 is complied with.				
265.257 The requirements of 265.257 for incompatible wastes must be complied with.				
SUBPART M - LAND TREATMENT				
265.272(a) Hazardous waste must not be placed at a land treatment facility unless it can be made less hazardous or non-hazardous.				
(b) Run-on must be diverted away from other active portions as of one year after the effective date of Part 265.				

Not in compliance - No
Not applicable - NA

REQUIREMENT	Yes	No	N/A	COMMENTS
265.272 -- Continued (c) Run-off from active portions must be collected as of one year after the effective date of Part 265				
265.273 Waste analyses must be conducted pursuant to 265.273.				
265.276(a) An owner or operator must notify the State Director within 60 days after the effective date of Part 265 if food chain crops are grown on the land treatment facility.				
(b) Food chain crops must not be grown on the treated area of a hazardous waste land treatment facility unless 265.276(b) is complied with.				
(c) Food chain crops must not be grown on a land treatment facility receiving waste that contains cadmium unless 265.276(c) is complied with.				
265.278 The owner or operator must have in writing and must implement an unsaturated zone monitoring plan pursuant to 265.278.				
265.279 The owner or operator must keep records of the application dates, application rates, quantities, and location of each hazardous waste placed in a facility.				
265.280 A land treatment facility must meet the closure and post-closure requirements of 265.280.				

REQUIREMENT	Not in compliance - No Not applicable - NA Yes	No	N/A	COMMENTS
265.281 Ignitable or reactive waste must not be placed in a land treatment facility unless 265.281 is complied with.				
265.282 Incompatible wastes must not be placed in the same land treatment area unless 265.17(b) is complied with.				
SUBPART N - LANDFILLS				
265.302(a) Run-on must be diverted away from the active portions within one year after the effective date of Part 265.				
(b) Run-off from active portions must be collected within one year after the effective date of Part 265.				
(d) Must control wind dispersal.				
265.309 The owner or operator must meet the surveying and recordkeeping requirements of 265.309.				
265.310 A landfill must comply with closure and post-closure requirements of 265.310.				
265.312 Ignitable or reactive waste must not be placed in a landfill unless 265.312 is complied with.				
265.313 Incompatible wastes must not be placed in a landfill unless 265.17(b) is complied with.				
265.314 Bulk or non-containerized liquid waste, waste containing free-liquids, or containers holding liquid waste should not be placed in a landfill unless the requirements of 265.314				

REQUIREMENT	Not applicable - NA			COMMENTS
	Yes	No	N/A	
265.315 (1) Empty containers must be reduced in volume as of one year after the effective date of Part 265.				
SUBPART O - INCINERATORS				
265.343 Must be at steady state conditions before adding hazardous waste.				
265.345 Waste analyses must be conducted pursuant to 265.345.				
265.347 Monitoring and inspections must be conducted as delineated in 265.347.				
265.351 At closure, the owner or operator must remove all hazardous waste and hazardous waste residues.				
SUBPART P - THERMAL TREATMENT				
265.373 Must be at steady state conditions before adding hazardous wastes.				
265.375 Waste analyses must be conducted pursuant to 265.375.				
265.377 Monitoring and inspections must be conducted as delineated in 265.377.				
265.301 At closure, the owner or operator must remove all hazardous waste residues.				
265.382 Open burning of hazardous waste is prohibited except for the open burning and detonation of waste explosives.				

REQUIREMENT	Not applicable - NA			COMMENTS
	Yes	No	N/A	
SUBPART Q - CHEMICAL, PHYSICAL, AND BIOLOGICAL TREATMENT				
265.401(a) Must comply with 265. 17(b)				
(b) Hazardous waste must not be placed in the treatment process or equipment if any failure of equipment or the process would occur.				
(c) A continuously-fed process must be equipped with a means to stop the inflow.				
265.402 Waste analyses and trial tests must be conducted pursuant to 265. 402.				
265.403 Inspections must be made pursuant to 265.403.				
265.404 At closure, all hazardous waste and hazardous waste residues must be removed.				
265.405 Ignitable or reactive waste must not be placed in a treatment process unless 265.405 is complied with.				
265.406 Incompatible wastes must not be placed in the same treatment process unless 265.17(b) is complied with.				
SUBPART R - UNDERGROUND INJECTION				
265.430(a) underground injection of hazardous waste is not subject to the closure and post-closure or financial requirements of Part 265. Underground injection is subject to the other requirements of Part 265.				

REQUIREMENT	Not in compliance - NO Not applicable - NA			COMMENTS
	Yes	No	N/A	
Other questions or standards. Are there any other generators transporting their waste to this hazardous waste management facility?				

June 19, 1981

Mr. Raymond Bartlow, Plant Manager
Koppers Company, Inc.
Box 160
Tie Plant, MS 38960

Dear Mr. Bartlow:

RE: Interim Status Inspection of Koppers Co., Inc., Tie Plant, MS

On June 17, 1981, an interim status inspection was conducted of the Koppers Company, Inc., located at Tie Plant, Mississippi. A copy of the inspection report was retained by you. I also completed the inspection form pertaining to chemical, physical, and biological treatment as it pertains to the lagoon, a copy of which is attached.

The following discrepancy needs to be corrected at this time: Section F; Subpart B--General Facility Standards - 402.7-14(b).

It was determined that the inspection log of the lagoon should be placed in your hazardous waste file. The inspection log should identify what is to be checked and what action is taken, if any, for malfunctions, just as you have done for the container storage area. I am enclosing an example inspection log for lagoons.

You afe requested to submit to this office as soon as possible a schedule for correction of this discrepancy.

If I can be of any assistance to you, please do not hesitate in calling.

Sincerely,

Freddie A. Roberts

Freddie A. Roberts, Sanitarian
Solid Waste Management Branch

FAR/cs

Attachment

	Yes	No	N/A	COMMENTS
SUBPART Q - CHEMICAL, PHYSICAL, AND BIOLOGICAL TREATMENT				
402.7-401(a) Must comply with 402.7-17(b).	X			
(b) Hazardous waste must not be placed in the treatment process or equipment if any failure of equipment or the process would occur.	X			
(c) A continuously-fed process must be equipped with a means to stop the inflow.	X			
402.7-402 Waste analyses and trial tests must be conducted pursuant to 402.7-402.	X			
402.7-403 Inspections must be made pursuant to 402.7-403.	X			
402.7-404 At closure, all hazardous waste and hazardous waste residues must be removed.	X			
402.7-405 Ignitable or reactive waste must not be placed in a treatment process unless 402.7-405 is complied with.			X	
402.7-406 Incompatible wastes must not be placed in the same treatment process unless 402.7-17(b) is complied with.			X	
SUBPART R - UNDERGROUND INJECTION				
402.7-430(a) underground injection of hazardous waste is not subject to the closure and post-closure or financial requirements of Part 402.7. Underground injection is subject to the other requirements of Part 402.7.				

INSPECTION CHECKLIST

Week of:

AREA	DAY/SIGNATURE Mon	Tue	Wed	Thu	Fri	Sat	Sun	REMARKS (continue on back)
Check the following DAILY and record discrepancies and maintenance								
IMPOUNDMENT 1								
• Inspect and record freeboard level to ensure water level does not exceed 4 feet.								
• Inspect valves and fittings at discharge pipe for leaks. Ensure valve can be closed.								
• Inspect pressure safety release valve for intact leaded seal to ensure there has been no tampering with setting.								
IMPOUNDMENT 2								
• Inspect and record freeboard level to ensure water level does not exceed 4 feet.								
• Inspect valves and fittings at discharge pipe for leaks. Ensure valve can be closed.								
• Inspect pressure safety release valve for intact leaded seal to ensure there has been no tampering with setting.								
PUMP ROOM								
• Test automatic alarm at noon.								
• Check pressure on fire extinguishers.								
• Check valves and pipe fitting for leaks.								
• Check sump for accumulated water								
• Check for excessive or noxious odors								
Check the following WEEKLY and record discrepancies and maintenance								
• Examine the dikes at Impoundments 1 and 2 for signs of erosion, cracking, wet spots, or other signs of leaking.								
• Check emergency spillway for accumulated debris.								
Check the following MONTHLY and record discrepancies and maintenance								
• Examine downhill berm for signs of erosion.								

FIGURE 6

SAMPLE INSPECTION CHECKLIST FOR IMPOUNDMENT FACILITY

SOL[illegible]ASTE MANAGEMENT BRANCH ACTIV[illegible]S FORM

FACILITY NAME: Koppers Co. Inc.

FACILITY ADDRESS: Box 160

FACILITY LOCATION: Tie Plant, ms. 38960

FACILITY CONTACT: Mr. Bartlow PHONE NO: 226-4584

see enclosure

Fredelle A. Robert
Signature of Inspector

FACILITY ID NUMBER | DATE 6-17-81

M	S	0	0	0	7	0	2	7	5	4	3

INSPECTOR (Single letter code)

R			

TYPE ACTIVITY (Enter code(s))

F	S										

CI - compliance inspection
FO - follow-up inspection
CO - complaint investigation
IS - interim status inspection
SI - site investigation
GB - geological boring
TO - training operator
MO - monitoring
TA - technical assistance
SR - special request
OR - other (specify)

TYPE FACILITY (Enter code(s))

G	N	S	L	T	R						

GN - generator
TR - treater
TP - transporter
SS - storage (short-term)
SL - storage (long-term)
LF - landfill
SF - sanitary landfill
OD - open dump
LM - landfarm
LO - lagoon (impoundment)
UI - UIC
IN - incinerator
PF - processing facility
TS - transfer station
OR - other (specify)

VIOLATIONS

Section No.						Subsection	
2	6	5	0	1	4		b

GENERATOR CHECKLIST

Facility Name, Location

Koppers - Tie Plant

ID Number

MSD 007027543

Date

6-17-91

	Compliance		
	Yes	No	N/
402.5-10 thru 13. Manifest Requirements (no manifest to date)			
a) Properly designated facility			X
b) Identification (ID code, name, address, date)			X
c) Waste info. (shipping desc., waste code, quantity, units)			X
d) Emergency info. (special handling instructions, phone nos.)			X
e) Certification			X
f) Copies to all required parties			X
402.5-20 Container Requirements			
a) Proper construction	X		
b) No leaks or corrosion	X		
c) Incompatible waste separation	X		
402.5-21 & 22 Labeling & Marking			
a) DOT shipping description	X		
b) Proper label (Haz. waste - If found, etc.; ≤110 gallons)	X		
402.5-23 Placards for Transport	X		
402.5-24 Waste Accumulation Time			
Records; dates and waste info. on container labels	X		
402.5-30 thru 33 Recordkeeping & Reportings			
a) Manifests - 3 years			X
b) Annual reports - 3 years			X
c) Exception reports - (35-day max. turnaround on manifests)			X
d) Test results of waste analysis			X
402.5-40 International Shipments			X

Comments

Have manifests that meet requirements but have not shipped any. will be using clinical Waste Management

Freddie A. Roberts

MSD 007 02 7543

INTERIM STATUS COMPLIANCE CHECKLIST

FACILITY Koppers
LOCATION Tie Plant
DATE 6-17-81
INSPECTORS Freddie A. Roberts

cc: Raymond Bartlow

REQUIREMENT	Not in compliance - No Not applicable - NA Yes	No	N/A	COMMENTS
SUBPART B - GENERAL FACILITY STANDARDS				
402.7-12 Required Notices				
a) The facility owner or operator must notify the Director at least four weeks in advance of receipt of wastes from a foreign source.			X	
b) Before transferring ownership or operation of a facility, the facility's owner or operator must notify the new owner or operator of the requirements of 40 CFR 265 and 122.			X	
402.7-13 General Waste Analysis Before treating, storing, or disposing of haardous waste, the facility owner or operator must obtain a detailed chemical and physical analysis of wastes. The analysis must contain all the information which must be known to treat, store, or dispose the waste in accordance with the federal requirements.	X	X		~~need on lagoon general~~
402.7-14 Security to Prevent Unknowing and Unauthorized Access to the Facility				
a) The owner or operator must prevent the unknowing entry and minimize the possibility for unauthorized entry unless:				
1) physical contact with the waste, structures, or equipment will not be injurious			X	
2) disturbance of the waste or equipment will not violate the requirements of Part 265.			X	

In compliance - Yes
Not in compliance - No
Not applicable - NA

REQUIREMENT.	Yes	No	N/A	COMMENTS
SUBPART F - GROUNDWATER MONITORING				
402.7-90 Owner or operator must implement a groundwater monitoring program capable of determining the facility's impact on the quality of the upper aquifer within one year of the effective date of 402.7-90.			X	
402.7-91 - 402.7-94 The owner and operator must install, operate, and maintain a groundwater monitoring system which meets the requirements of 402.7-91 - 402.7-94..			X	
402.7-90(c) All of the groundwater monitoring requirements may be waived if the owner or operator can demonstrate that there is a low potential for migration of hazardous waste constituents from the facility via the uppermost aquifer below the facility to water supply wells or to surface water.			X	
SUBPART G - CLOSURE AND POST-CLOSURE				
402.7-111 The owner or operator must close his facility in a manner that: 1) minimizes the need for future maintenance, and 2) controls, minimizes, or eliminates post-closure escape of hazardous waste.				
402.7-112(a) The owner or operator must have a written closure plan on the effective date of Part 402.7.	X			

REQUIREMENT	Not in compliance - NO Not applicable - NA Yes	No	N/A	COMMENTS
402.7-14 - Continued				
b) Unless exempt under 402.7-14 (a)(1) or 402.7-14(a)(2), a facility must have:				
1) a 24-hour surveillance system				
2) (i) an artificial or natural barrier which completely surrounds the active portion of the facility		X		need to extend the barrier for the dumps.
(ii) a means to control entry		X		
c) A sign warning of the danger of intruding into the facility.	X			
402.7-15 Inspection and Monitoring				
a) The owner or operator must inspect the facility for malfunctions and deterioration, operator errors, or discharges which may be causing or lead to release of hazardous waste constituents to the environment or a threat to human health.	X			
b) The owner or operator must develop and follow a schedule and plan for inspections.	X			
c) The owner or operator must take remedial action upon the detection of malfunction or the deterioration of equipment and structures when a hazard is imminent.			X	
d) The owner or operator must record inspections in an inspection log and must keep the records for at least three years from the date of inspection.	X			Started in June

REQUIREMENT	Not in compliance - No Not applicable - NA Yes	No	N/A	COMMENTS
402.7-16 Facility Personnel Training				
a) Facility personnel must successfully complete a program of classroom instruction or on-the-job training that teaches them to perform their duties in a way that ensures the facility's compliance with the requirements of Part 265.	X			
b) The training program must be completed within six months of the effective date of Part 265.	X			
c) There must be an annual review of the initial training in (a) above.			X	
d) The owner or operator must maintain records of training.	X			
e) Training records on current personnel must be kept until closure of the facility.	X			
402.7-17 General Requirements for Ignitable, Reactive or Incompatible Wastes				
a) The owner or operator must take precautions to prevent accidental ignition or reaction of ignitable or reactive waste.			X	
b) Treatment, storage, or disposal of ignitable or reactive waste and the mixture or commingling of incompatible wastes must be conducted so that it does not:			X	
1) Generate extreme heat or pressure, fire or explosion, or violent reaction;			X	
2) Produce uncontrolled toxic mists, fumes, dusts, or gases in sufficient			X	

REQUIREMENT.	Not in compliance - No Not applicable - NA			COMMENTS
	Yes	No	N/A	
402.7-17 - Continued-- quantities to threaten human health; 3) Produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosions; 4) Damage the structural integrity of the device or facility containing waste; or 5) Through other like means threaten human health or the environment.			X X X	
SUBPART C - PREPAREDNESS AND PREVENTION Pursuant to 402.7-30 through 402.7-37, facilities must be maintained and operated for and prevention of releases of hazardous wastes controlled by the State.	X			
SUBPART D - CONTINGENCY PLANS Pursuant to 402.7-56, facilities must have contingency plans and emergency procedures to be followed in the event of a release of hazardous waste.	X			
SUBPART E - MANIFEST SYSTEM, RECORDKEEPING, AND REPORTING 402.7-71(a)(1-5) If a facility receives hazardous waste accompanied by a manifest, the owner or operator must meet the requirements of 402.7-71(a)(1-5)			X	
402.7-71(b)(1-5) If a facility receives, from a rail or water transporter, hazardous waste which is accompanied by a shipping paper, the owner or operator must meet the requirements of 402.7-71.			X	

In compliance - Yes
Not in compliance - No
Not applicable - NA

REQUIREMENT.	Yes	No	N/A	COMMENTS
402.7-72(a) Upon discovery of significant manifest discrepancy, the owner or operator must attempt to reconcile the discrepancy with the waste generator or transporter.			Y	
(b) If a significant manifest discrepancy is not resolved, the owner or operator must notify the Director.			Y	
402.7-73(b) The owner or operator must keep a written operating record at the facility which meets the requirements of 402.7-73(b).	X			
402.7-74(a) All records must be furnished upon request and available at all times for inspection by the Director or EPA.	X			
(c) A copy of records of waste disposal locations and quantities must be submitted to the Director and the local land authority upon closure of the facility.			Y	
402.7-75 The owner or operator must submit an annual report to the Director in compliance with the requirements of 402.7-75.			Y	
402.7-76 The receipt of any unmanifested waste must be reported to the Director.			Y	
402.7-77 The owner or operator must submit a report to the Director if any of the following occur:				
a) releases, fires, explosions			Y	
b) groundwater contamination				
c) facility closure.				

In compliance - Yes
Not in compliance - No
Not applicable - NA

REQUIREMENT.	Yes	No	N/A	COMMENTS
402.7-112(a) Continued-- The closure plan must include: 1) A description of how and when the facility will be partially closed, if applicable, and ultimately closed.	X			
2) An estimate of the maximum inventory of wastes in storage or treatment at any given time.	X			but not on drums
3) Steps to decontaminate facility equipment.	X			
4) A schedule for final closure which must include, as a minimum, anticipated dates when wastes will no longer be received, anticipated date for completion of final closure, and intervening milestone dates.	X			
402.7-113(a) Closure must be initiated within 90 days after receiving the final volume of hazardous wastes.			X	
(b) The owner or operator must complete closure activities within six months after receiving the final volume of wastes.			X	
402.7-114 Upon completion of closure, all equipment and structures must be properly disposed of or decontaminated.			X	
402.7-115 The owner or operator and an independent registered professional engineer must certify that the facility has been closed in accordance with the approved closure plan.			X	

In compliance - Yes
Not in compliance - No
Not applicable - NA

REQUIREMENT	Yes	No	N/A	COMMENTS
402.7-117(a) Post closure care must consist of at least:				
1) Groundwater monitoring			X	
2) Maintenance of the contaminant system.			X	
The owner or operator must have a post-closure plan on the effective date of Part 402.7 and it must include:			X	
1) Groundwater monitoring activities and frequency.			X	
2) Maintenance activities and frequencies to ensure the integrity of the cap, final cover, or other containment structures, and functions of the facilities monitoring equipment.			X	
402.7-119 Within 90 days after closure, the owner or operator must submit a survey plat of the facility.			X	
402.7-120 The owner or operator must record a notice on the deed that the land has been used to manage hazardous waste.			X	
SUBPART H - FINANCIAL REQUIREMENTS				
402.7-142(a) The owner or operator must develop and maintain a current estimate of closure and post-closure costs.	X			Partial - lagoon
SUBPART I - OTHER FACILITY STANDARDS				
402.7-170 - 402.7-172 The container must be compatible with the waste to be stored.	X			

In compliance - Yes
Not in compliance - No
Not applicable - NA

REQUIREMENT	Yes	No	N/A	COMMENTS
402.7-173 Containers holding hazardous waste must be kept closed and must not be opened, handled, or stored in a manner which may cause a rupture or leak.	X			
402.7-174 Areas where containers are stored must be inspected weekly.	X			
402.7-176 Containers holding ignitable or reactive waste must be located at least 15 meters from the facility's property line.			X	
402.7-177(a) Incompatible wastes must not be placed in the same container.			X	
(b) A storage container holding a hazardous waste that is incompatible with any waste or other materials stored nearby must be separated or protected from the other materials.			X	
SUBPART J - TANKS				
402.7-192(b) Hazardous waste must be placed in a tank if they could cause the tank or its liner to leak.				
(c) Uncovered tanks must have a least two feet of freeboard unless other containment structures, a drainage control system, or other diversion structures with a capacity that equals or exceeds the volume of the top two feet of the tank.				
(d) Tanks which have a continuous feed system must be equipped with a means to stop the inflow.				

REQUIREMENT	Not in compliance - NO / Not applicable - NA			COMMENTS
	Yes	No	N/A	
402.7-193 Waste analysis must be conducted pursuant to 402.7-13, and 402.7-193(a).				
402.7-194 Tanks must be inspected in accordance with 402.7-194.				
402.7-197 At closure, all hazardous waste and hazardous waste residues must be removed from the tanks.				
402.7-198 Ignitable or reactive waste should not be placed in a tank unless 402.7-198 is complied with.				
402.7-199 Incompatible wastes must not be placed in the same tank unless 402.7-176 is complied with.				
SUBPART K - SURFACE IMPOUNDMENTS				
402.7-222 Must maintain at least two feet of freeboard.	X			
402.7-223 Earthen dikes must have protective cover.				
402.7-225 Must conduct waste analyses and trial tests in accordance with 402.7-225.	X	X		
402.7-226(1) Must inspect the freeboard level at least once each operating day.	X			
(2) Must inspect the surface impoundment at least once a week to detect any leaks, deterioration, or failure.	X			
402.7-228 The surface impoundment must close in accordance with 402.7-228.			X	

Not in compliance - No
Not applicable - NA

REQUIREMENT	Yes	No	N/A	COMMENTS
402.7-229 Ignitable or reactive waste must not be placed in a surface impoundment unless 402.7-229 is complied with.			X	
402.7-230 Incompatible wastes must not be placed in the same surface impoundment unless 402.7-17(b) is complied with.			X	
SUBPART L - WASTE PILES				
402.7-251 A waste pile must be protected and managed to control wind dispersal.				
402.7-252 An owner or operator must conduct waste analyses unless the facility meets the exemptions of 402.7-252.				
402.7-253 Within one year after the effective date of the regulations, leachate or run-off from a pile must be controlled pursuant to 402.7-253.				
402.7-256 Ignitable or reactive waste must not be placed in a waste site unless 402.7-256 is complied with.				
402.7-257 The requirements of 402.7-257_for incompatible wastes must be complied with.				
SUBPART M - LAND TREATMENT				
402.7-272(a) Hazardous waste must not be placed at a land treatment facility unless it can be made less hazardous or non-hazardous.				
(b) Run-on must be diverted away from other active portions as of one year after the effective date of Part 265.				

REQUIREMENT	Not in compliance - No Not applicable - NA Yes	No	N/A	COMMENTS
402.7-272 -- Continued (c) Run-off from active portions must be collected as of one year after the effective date of Part 402.7.				
402.7-273 Waste analyses must be conducted pursuant to 402.7-273.				
402.7-276(a) An owner or operator must notify the State Director within 60 days after the effective date of Part 402.7 if food chain crops are grown on the land treatment facility.				
(b) Food chain crops must not be grown on the treated area of a hazardous waste land treatment facility unless 402.7-276(b) is complied with.				
(c) Food chain crops must not be grown on a land treatment facility receiving waste that contains cadmium unless 402.7-276(c) is complied with.				
402.7-278 The owner or operator must have in writing and must implement an unsaturated zone monitoring plan pursuant to 402.7-278.				
402.7-279 The owner or operator must keep records of the application dates, application rates, quantities, and location of each hazardous waste placed in a facility.				
402.7-280 A land treatment facility must meet the closure and post-closure requirements of 402.7-280.				

REQUIREMENT	Not in compliance - No Not applicable - NA Yes	No	N/A	COMMENTS
402.7-281 Ignitable or reactive waste must not be placed in a land treatment facility unless 402.7-281 is complied with.				
402.7-282 Incompatible wastes must not be placed in the same land treatment area unless 402.7-17(b) is complied with.				
SUBPART N - LANDFILLS				
402.7-302(a) Run-on must be diverted away from the active portions within one year after the effective date of Part 402.7.				
(b) Run-off from active portions must be collected within one year after the effective date of Part 402.7.				
(d) Must control wind dispersal.				
402.7-309 The owner or operator must meet the surveying and recordkeeping requirements of 402.7-309.				
402.7-310 A landfill must comply with closure and post-closure requirements of 402.7-310.				
402.7-312 Ignitable or reactive waste must not be placed in a landfill unless 402.7-312 is complied with.				
402.7-313 Incompatible wastes must not be placed in a landfill unless 402.7-17(b) is complied with.				
402.7-314 Bulk or non-containerized liquid waste, waste containing free-liquids, or containers holding liquid waste should not be placed in a landfill unless the requirements of 402.7-314 are complied with.				

Not in compliance - NO
Not applicable - NA

REQUIREMENT	Yes	No	N/A	COMMENTS
402.7-315 (i) Empty containers must be reduced in volume as of one year after the effective date of Part 402.7.				
SUBPART O - INCINERATORS				
402.7-343 Must be at steady state conditions before adding hazardous waste.				
402.7-345 Waste analyses must be conducted pursuant to 402.7-345.				
402.7-347 Monitoring and inspections must be conducted as delineated in 402.7-347.				
402.7-351 At closure, the owner or operator must remove all hazardous waste and hazardous waste residues.				
SUBPART P - THERMAL TREATMENT				
402.7-373 Must be at steady state conditions before adding hazardous wastes.				
401.7-375 Waste analyses must be conducted pursuant to 402.7-375.				
402.7-377 Monitoring and inspections must be conducted as delineated in 402.7-377.				
402.7-301 At closure, the owner or operator must remove all hazardous waste residues.				
402.7-382 Open burning of hazardous waste is prohibited except for the open burning and detonation of waste explosives.				

REQUIREMENT	Not in compliance - NO Not applicable - NA Yes	No	N/A	COMMENTS
SUBPART Q - CHEMICAL, PHYSICAL, AND BIOLOGICAL TREATMENT				
402.7-401(a) Must comply with 402.7-17(b).	X			
(b) Hazardous waste must not be placed in the treatment process or equipment if any failure of equipment or the process would occur.	X			
(c) A continuously-fed process must be equipped with a means to stop the inflow.	X			
402.7-402 Waste analyses and trial tests must be conducted pursuant to 402.7-402.	X			
402.7-403 Inspections must be made pursuant to 402.7-403.	X			
402.7-404 At closure, all hazardous waste and hazardous waste residues must be removed.	X			
402.7-405 Ignitable or reactive waste must not be placed in a treatment process unless 402.7-405 is complied with.			X	
402.7-406 Incompatible wastes must not be placed in the same treatment process unless 402.7-17(b) is complied with.			X	
SUBPART R - UNDERGROUND INJECTION				
402.7-430(a) underground injection of hazardous waste is not subject to the closure and post-closure or financial requirements of Part 402.7. Underground injection is subject to the other requirements of Part 402.7.				

In compliance - Yes
Not in compliance - No
Not applicable - NA

REQUIREMENT	Yes	No	N/A	COMMENTS
Other questions or standards.				
Are there any other generators transporting their waste to this hazardous waste management facility?				

Koppers Company, Inc., Forest Products Group
Pittsburgh, PA 15219, 412-227-2000

CERTIFIED MAIL

KOPPERS
Architectural and
Construction Materials

December 16, 1980

Mr. Jim Hardaje
Division of Solid Waste Management
and Vector Control
Bureau of Environmental Health
P. O. Box 1700
Jackson, MS 39205

Dear Mr. Hardaje:

Attached is the Hazardous Waste Inspection Form for the Koppers Company, Inc., Forest Products Group, Grenada, Mississippi plant.

The three main items not complete on the form are:

1. The installation EPA, I.D. No. has not been issued.
2. A waste transporter } have not been chosen
3. A waste disposer }

If there are further questions, please call or write.

Sincerely,

W. A. Sudekum

W. A. Sudekum
Project Engineer
Engineering Department
Forest Products Group

WAS:cg
Enclosure
cc: R. C. Bartlow

DEC 22 '80

Writer's Direct Dial Number _____

POTENTIAL HAZARDOUS WASTE SITE
IDENTIFICATION AND PRELIMINARY ASSESSMENT

REGION	SITE NUMBER (to be assigned by Hq)

NOTE: This form is completed for each potential hazardous waste site to help set priorities for site inspection. The information submitted on this form is based on available records and may be updated on subsequent forms as a result of additional inquiries and on-site inspections.

GENERAL INSTRUCTIONS: Complete Sections I and III through X as completely as possible before Section II *(Preliminary Assessment)*. File this form in the Regional Hazardous Waste Log File and submit a copy to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force *(EN-335)*; 401 M St., SW; Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME: Kopper Inc. (Tie Plant)

B. STREET *(or other identifier)*:

C. CITY: Greenville

D. STATE: MS

E. ZIP CODE: 38901

F. COUNTY NAME:

G. OWNER/OPERATOR *(if known)*

1. NAME: Koppers Inc. / Roy Barlow

2. TELEPHONE NUMBER: 226-4584

H. TYPE OF OWNERSHIP

☐ 1. FEDERAL ☐ 2. STATE ☐ 3. COUNTY ☐ 4 MUNICIPAL ☒ 5 PRIVATE ☐ 6 UNKNOWN

I. SITE DESCRIPTION: Open field

J. HOW IDENTIFIED *(i.e., citizen's complaints, OSHA citations, etc.)*: Congressman Eckhardt's report

K. DATE IDENTIFIED *(mo., day, & yr.)*:

L. PRINCIPAL STATE CONTACT

1. NAME: State Board of Health Div Solid Waste

2. TELEPHONE NUMBER: 601-982-6317

II. PRELIMINARY ASSESSMENT *(complete this section last)*

A. APPARENT SERIOUSNESS OF PROBLEM

☐ 1. HIGH ☐ 2. MEDIUM ☒ 3. LOW ☐ 4 NONE ☐ 5 UNKNOWN

B. RECOMMENDATION

☐ 1. NO ACTION NEEDED *(no hazard)*

☐ 2. IMMEDIATE SITE INSPECTION NEEDED
a. TENTATIVELY SCHEDULED FOR: _____
b. WILL BE PERFORMED BY: _____

☐ 3. SITE INSPECTION NEEDED
a. TENTATIVELY SCHEDULED FOR: _____
b. WILL BE PERFORMED BY: _____

☒ 4. SITE INSPECTION NEEDED *(low priority)*

C. PREPARER INFORMATION

1. NAME: Freddie A. Roberts

2. TELEPHONE NUMBER: 601-982-6317

3. DATE *(mo., day, & yr.)*: 11-19-79

III. SITE INFORMATION

A. SITE STATUS

☒ 1. ACTIVE *(Those industrial or municipal sites which are being used for waste treatment, storage, or disposal on a continuing basis, even if inefficiently.)*

☐ 2. INACTIVE *(Those sites which no longer receive wastes.)*

☐ 3. OTHER *(specify)*: _____ *(Those sites that include such incidents like "midnight dumping" where no regular or continuing use of the site for waste disposal has occurred.)*

B. IS GENERATOR ON SITE?

☐ 1. NO ☒ 2. YES *(specify generator's four-digit SIC Code)*: 2491

C. AREA OF SITE *(in acres)*:

D. IF APPARENT SERIOUSNESS OF SITE IS HIGH, SPECIFY COORDINATES
1. LATITUDE *(deg.-min.-sec.)*:
2. LONGITUDE *(deg.-min.-sec.)*:

E. BUILDINGS ON THE SITE?

☐ NO ☒ 2. YES *(specify)*: Plant is next to disposal site

Continue On Reverse

Continued From Front

IV. CHARACTERIZATION OF SITE ACTIVITY

Indicate the major site activity(ies) and details relating to each activity by marking 'X' in the appropriate boxes.

X	A. TRANSPORTER
	1. RAIL
	2. SHIP
	3. BARGE
	4. TRUCK
	5. PIPELINE
	6. OTHER (specify):

X	B. STORER
	1. PILE
	2. SURFACE IMPOUNDMENT
	3. DRUMS
	4. TANK, ABOVE GROUND
	5. TANK, BELOW GROUND
	6. OTHER (specify):

X	C. TREATER
	1. FILTRATION
	2. INCINERATION
	3. VOLUME REDUCTION
	4. RECYCLING/RECOVERY
	5. CHEM./PHYS. TREATMENT
X	6. BIOLOGICAL TREATMENT
	7. WASTE OIL REPROCESSING
	8. SOLVENT RECOVERY
	9. OTHER (specify):

X	D. DISPOSER
	1. LANDFILL
X	2. LANDFARM
	3. OPEN DUMP
	4. SURFACE IMPOUNDMENT
	5. MIDNIGHT DUMPING
	6. INCINERATION
	7. UNDERGROUND INJECTION
	8. OTHER (specify):

E. SPECIFY DETAILS OF SITE ACTIVITIES AS NEEDED

Biodegrading of creosote by leaching into soil

V. WASTE RELATED INFORMATION

A. WASTE TYPE

☐ 1 UNKNOWN ☐ 2. LIQUID ☐ 3. SOLID ☒ 4. SLUDGE ☐ 5. GAS

B. WASTE CHARACTERISTICS

☐ 1. UNKNOWN ☒ 2. CORROSIVE ☐ 3. IGNITABLE ☐ 4 RADIOACTIVE ☐ 5 HIGHLY VOLATILE
☒ 6. TOXIC ☐ 7. REACTIVE ☐ 8. INERT ☐ 9 FLAMMABLE

☐ 10. OTHER (specify):

C. WASTE CATEGORIES

1. Are records of wastes available? Specify items such as manifests, inventories, etc. below.

NO

2. Estimate the amount (specify unit of measure) of waste by category; mark 'X' to indicate which wastes are present.

X	a. SLUDGE	X	b. OIL	X	c. SOLVENTS	X	d. CHEMICALS	X	e. SOLIDS	X	f. OTHER
	AMOUNT: 10,000 lbs/yr.		AMOUNT		AMOUNT		AMOUNT		AMOUNT		AMOUNT
	UNIT OF MEASURE: Lbs		UNIT OF MEASURE		UNIT OF MEASURE		UNIT OF MEASURE		UNIT OF MEASURE		UNIT OF MEASURE
	(1) PAINT, PIGMENTS		(1) OILY WASTES		(1) HALOGENATED SOLVENTS		(1) ACIDS		(1) FLYASH		(1) LABORATORY PHARMACEUT.
	(2) METALS SLUDGES		(2) OTHER (specify):		(2) NON-HALOGNTD. SOLVENTS		(2) PICKLING LIQUORS		(2) ASBESTOS		(2) HOSPITAL
	(3) POTW				(3) OTHER (specify):		(3) CAUSTICS		(3) MILLING/ MINE TAILINGS		(3) RADIOACTIVE
	(4) ALUMINUM SLUDGE						(4) PESTICIDES		(4) FERROUS SMLTG. WASTES		(4) MUNICIPAL
	(5) OTHER (specify):						(5) DYES/INKS		(5) NON-FERROUS SMLTG. WASTES		(5) OTHER (specify):
	Creosote						(6) CYANIDE		(6) OTHER (specify):		
							(7) PHENOLS				
							(8) HALOGENS				
							(9) PCB				
							(10) METALS				
							(11) OTHER (specify)				

Continue On Page 3

Continued From Page 2

WASTE RELATED INFORMATION (continue)

3. LIST SUBSTANCES OF GREATEST CONCERN WHICH MAY BE ON THE SITE (place in descending order of hazard).

Creosote

4. ADDITIONAL COMMENTS OR NARRATIVE DESCRIPTION OF SITUATION KNOWN OR REPORTED TO EXIST AT THE SITE.

disc creosote into soil to biodegrate substance
Treating with lime

VI. HAZARD DESCRIPTION

A. TYPE OF HAZARD	B. POTENTIAL HAZARD (mark 'X')	C. ALLEGED INCIDENT (mark 'X')	D. DATE OF INCIDENT (mo., day, yr.)	E. REMARKS
1. NO HAZARD				
2. HUMAN HEALTH				
3. NON-WORKER INJURY/EXPOSURE	X			
4. WORKER INJURY				
5. CONTAMINATION OF WATER SUPPLY				
6. CONTAMINATION OF FOOD CHAIN				
7. CONTAMINATION OF GROUND WATER				
8. CONTAMINATION OF SURFACE WATER	X			run off
9. DAMAGE TO FLORA/FAUNA				
10. FISH KILL				
11. CONTAMINATION OF AIR				
12. NOTICEABLE ODORS				
13. CONTAMINATION OF SOIL				
14. PROPERTY DAMAGE				
15. FIRE OR EXPLOSION				
16. SPILLS/LEAKING CONTAINERS/ RUNOFF/STANDING LIQUIDS				
17. SEWER, STORM DRAIN PROBLEMS				
18. EROSION PROBLEMS				
19. INADEQUATE SECURITY				
20. INCOMPATIBLE WASTES				
21. MIDNIGHT DUMPING				
22. OTHER (specify):				

Continue On Reverse

VII. PERMIT INFORMATION

A. INDICATE ALL APPLICABLE PERMITS HELD BY THE SITE.

☐ 1. NPDES PERMIT ☐ 2. SPCC PLAN ☐ 3. STATE PERMIT *(specify)*: _____

☐ 4. AIR PERMITS ☐ 5. LOCAL PERMIT ☐ 6. RCRA TRANSPORTER

☐ 7. RCRA STORER ☐ 8. RCRA TREATER ☐ 9. RCRA DISPOSER

☐ 10. OTHER *(specify)*: No Permit

B. IN COMPLIANCE?

☐ 1. YES ☒ 2. NO ☐ 3. UNKNOWN

4. WITH RESPECT TO *(list regulation name & number)*: _____

VIII. PAST REGULATORY ACTIONS

☒ A. NONE ☐ B. YES *(summarize below)*

IX. INSPECTION ACTIVITY *(past or on-going)*

☒ A. NONE ☐ B. YES *(complete items 1,2,3, & 4 below)*

1. TYPE OF ACTIVITY	2 DATE OF PAST ACTION *(mo., day, & yr.)*	3 PERFORMED BY: *(EPA/State)*	4. DESCRIPTION

X. REMEDIAL ACTIVITY *(past or on-going)*

☐ A. NONE ☐ B. YES *(complete items 1, 2, 3, & 4 below)*

1. TYPE OF ACTIVITY	2. DATE OF PAST ACTION *(mo., day, & yr.)*	3. PERFORMED BY: *(EPA/State)*	4. DESCRIPTION

NOTE: Based on the information in Sections III through X, fill out the Preliminary Assessment *(Section II)* information on the first page of this form.

Grenada

FORM NO. MHW-101-A

HAZARDOUS WASTE INSPECTION FORM
(Complete Legibly)

INSPECTION BY _____
DATE OF INSPECTION 12-12-80 19___ TIME _____ a.m./p.m.

PART I - INSTALLATION DATA

1-INSTALLATION E.P.A. I.D. NO. __/__/__/__/__/__/__/__/__/__/__/__/ NOT ISSUED

2-NAME OF INSTALLATION Koppers Company, Inc.

3-IF SUBSIDIARY, NAME OF PARENT CO. ----------

4-INSTALLATION MAILING ADDRESS Box 160

Tie Plant	Mississippi	38960	(601) 226-4584
City	State	Zip Code	Phone Number

5-LOCATION OF INSTALLATION Not Applicable
Street

Tie Plant	Mississippi	38960	(601) 226-4584
City	State	Zip Code	Phone Number

6-INSTALLATION CONTACT PERSON Raymond Bartlow

TITLE Plant Manager (601) 226-4584
Phone #/Extention

7-SIC CODE FOR PRINCIPLE PRODUCTS (4-DIGIT NO.)

a. 2491 d. _____
b. _____ e. _____
c. _____ f. _____

8-IN-HOUSE WASTE TREATMENT CAPABILITIES

On-Site Waste Treatment X Yes ____ No
POTW Discharge ____ Yes X No
NPDES No. 76-024 No Discharge Permit To Be Built By __/__/__

9-AIR POLLUTION CONTROL DEVICES X Yes ____ No

Permit No. 0960-00012 Type(s) Fly Ash Separator

To Be Built ____ Yes X No By / /

KOPPERS COMPANY, INC. - Tieplant

An investigation was made of this facility on November 19, 1979. It was determined that crisote is being disposed of on their own property. Crisote is part of their process in the treatment of lumber, posts, switch ties, pilings, and cross ties.

Koppers Company, Inc., has an SIC code of 2491. As determined by an EPA listing of wastes using SIC codes, the waste of this industry should consist of copper, arsenic, chromium, phenoles, oils, flourides, and cresote, which are toxic substances. However, the operator of this facility told me that crisote was the only thing that is a waste and it is landfarmed on approximately three (3) acres on the backside of this industry. The operator said that they disc crisote into the soil and the crisote biodegrades and deems itself nonhazardous. Upon site investigation, I further learned that lime is also used in the treating of this waste by spreading it over this disposal site. I do not believe that there is a runoff contamination of any surface water; however, I believe there should be ground borings made of this facility. From doing the SIA report, it was determined that this facility has lagoons. The operator said that these lagoons contained no hazardous wastes. He would not be specific as to the wastes actually going into the impoundments.

My recommendation is that there should be further investigation into their process to determine exactly what is going into these impoundments and geological assessments should be made by boring impoundments as well as the landfarm operation.

11/21/79

FR/cs

LAW ENGINEERING TESTING COMPANY
geotechnical, environmental & construction materials consultants
501 MINUET LANE
P.O. BOX 11297 • CHARLOTTE, NORTH CAROLINA 28220
(704) 523-2022

December 17, 1984

Mississippi Department of Natural Resources
Bureau of Pollution Control
P. O. Box 10385
Jackson, Mississippi 39209

Attention: Mr. John Hermann

Subject: Status Report of RCRA Part B Application
Koppers Company
Tie Plant (Grenada), Mississippi
LETCo. Job No. CH 5080

Gentlemen:

Law Engineering Testing Company, on behalf of Koppers Company, has prepared this status report of the RCRA Part B Application for Kopper's Tie Plant facility per the Mississippi Commission on Natural Resources Order No. 77284 dated October 10, 1984. This report briefly describes the status of a few key elements in the preparation of the Part B Application.

Topographic Map - The topographic map has become the critical item required for the Part B preparation. We have received two maps entitled "A Topographic Survey for Koppers Company, Grenada, Mississippi" which shows elevations near the waste-water pond and monitoring well elevations (ground surface and top of pipe) and "Traverse & Coordinates: for Aerial Mapping Control, Koppers Company, Grenada, Mississippi" which shows the Illinois Central Gulf Railroad, bench mark locations and elevations and monitoring well locations and elevations. A copy of each of these two maps is attached. Reportedly, the finalized map will be available by early January, 1985.

Field Permeability Testing - Hydraulic conductivity tests were performed at the site on December 3 and 4, 1984 at the nine monitoring well locations near the waste-pond area. The equipment used was an in-situ pressure transducer and a slug. A description of the field test method is attached. The data obtained from this method were processed and the hydraulic conductivities calculated using the NAVFAC Soil Mechanics Design Manual 7.1, May 1982. The results of the ground-water measurements made on October 17, 1984 and December 3-4, 1984 are presented in attached Table 1. The calculated in-situ hydraulic conductivities at each of the nine well locations are presented in atttached Table 2.

FILE COPY

November 21, 1984

Mr. James H. Scarbrough
Chief, Residuals Management Branch
U. S. Environmental Protection Agency
345 Courtland Street, N.E.
Atlanta, GA 30365

Dear Mr. Scarbrough:

The purpose of this letter is to request Region IV's opinion. On October 10, 1984, the Commission on Natural Resources issued an Order to Koppers Company, Inc., a wood preserver in Grenada, Mississippi, which required that the company analyze the sludge from the impoundment, the water which is being sprayed into the sprayfield, and the soil in the spray field for the purpose of determing whether the land treatment unit should be considered regulated under the hazardous waste regulations. A copy of the results is enclosed.

To summarize the results, the soil in the land treatment area has virtually the same constituents as the sludge in the impoundment with concentrations approximately two orders of the magnitude below that of the sludge in the impoundment.

Please provide your opinion to us by November 30, 1984.

Sincerely,

Jack McMillan, Director
Division of Solid Waste Management

JMM:vgr

Enclosure

LAW ENGINEERING TESTING COMPANY
geotechnical, environmental & construction materials consultants
501 MINUET LANE
P.O. BOX 11297 • CHARLOTTE, NORTH CAROLINA 28220
(704) 523-2022

November 13, 1984

Mississippi Department of Natural Resources
Bureau of Pollution Control
P. O. Box 10385
Jackson, Mississippi 39209

Attention: Mr. John Hermann

Subject: Status Report of RCRA Part B Application
Koppers Company
Tie Plant (Grenada), Mississippi
LETCo. Job No. CH 5080

Gentlemen:

Law Engineering Testing Company, on behalf of Koppers Company, has prepared this status report of the RCRA Part B Application for Koppers' Tie Plant facility per the Mississippi Commission on Natural Resources Order No. 77284 dated October 10, 1984. This report briefly describes the status of a few key elements in the preparation of the Part B Application.

Topographic Map - The topographic map is in the critical path of many subsequent activities required for the Part B preparation. We understand that the field work and the aerial photography have been completed. Reportedly, the finalized map will be available by the end of November.

Field Permeability Testing - Permeability coefficients (saturated hydraulic conductivities) of the subsurface materials, along with ground-water gradients (elevations) and effective porosities are required to compute rates of ground-water movement at the site. An attempt has been made to perform in-flow permeability testing in the existing monitoring wells. However, because of the high yield of the wells, the water levels could not be lowered sufficiently by bailing and pumping to perform reliable permeability tests. Arrangements are being made to obtain a special pressure transducer with an electronic readout unit to perform slug-type (in-flow and out-flow) permeability tests. That work is expected to occur within about 3 to 4 weeks, depending on the availability of the special equipment.

Additional Borings/Wells - The need for additional soil test borings and/or ground-water monitoring wells can not be determined until the topographic map is available and the directions and rates of ground-water movement have been evaluated based on existing data. We expect that recommendations for additional borings/wells, if needed, would be made by mid-December.

Chemical Analyses - At Koppers request, we are enclosing results of previous analyses as follows: ground-water samples from monitoring wells R-1, R-2, R-3 and R-4; a sample of water discharged to the spray field; a field blank of distilled water; a soil sample from the spray field; and a sample of the lagoon bottoms.

Although some activities are behind the projected schedule, we believe that if the schedule of key elements occur as discussed above, the Part B Application due date of January 31, 1985 can still be met. After the topographic map is available and preliminary evaluation of ground-water directions and rates has been completed, it may be prudent to have a meeting between the Bureau of Pollution Control, Koppers Company and Law Engineering to discuss the status and subsequent direction of the Part B preparation activities. If you have any questions regarding this status report, please contact us.

Very truly yours,

LAW ENGINEERING TESTING COMPANY

Jimmy N. Smith, P. E.
Senior Geotechnical Engineer

Neil J. Gilbert, P. E.
Senior Engineering Geologist

JNS/NJG:kdh

Enclosures

cc: Mr. Charles P. Brush
Koppers Company

RECORD OF TELEPHONE CONVERSATION

Name of firm or party: Ray Bartlow - Koppers

Address:

Contact: | Phone:

I talked with Ray concerning the potential problem of Koppers exceeding their Part A limitation for storage. Due to our preliminary decision to regulate the bottom floc in the oil/water separator, and the need to clean it out on a periodic basis, Koppers is having difficulty determining the appropriate method for handling it - eg since it is "hazardous", it cannot be fed to the boiler - it has a BTU value of about 500 Btu/lb

Koppers has taken samples and is awaiting results to support a possible delisting petition on this material. Until then, they are going to be accumulating it, hopefully for less than 90 days.

We should be having a meeting around the first week in December to discuss this and the Part B progress.

John Hum
Signature

11/13/84
Date

Ground-Water Flow Direction and Rate - Preliminary calculations (based on available survey data) indicate ground-water gradients in the vicinity of the waste-water lagoon are low and that velocities are relatively slow. Additional computations will be made when the topographic map is available. The ground-water flow directions can not be determined until the topographic map is available.

Additional Borings/Wells - The need for additional soil test borings and/or ground-water monitoring wells can not be determined until the topographic map is available and the directions and rates of ground-water movement have been evaluated based on existing data. We expect that recommendations for additional borings/wells, if needed, would be made by the end of January, 1985.

Because of the delay in receiving the topographic map, we can not have the revised Part B Application for this site completed by January 31, 1985. As indicated in Law Engineering's September 5, 1984 letter to Koppers, we need about eight weeks after receipt of the topographic map to prepare the submittal. If the map is available by early January, 1985, the submittal could be made about March 1, 1985.

After the topographic map is available and preliminary evaluation of ground-water directions and rates has been completed, it may be prudent to have a meeting between the Bureau of Pollution Control, Koppers Company and Law Engineering to discuss the status and subsequent direction of the Part B preparation activities. If you have any questions regarding this status report, please contact us.

Very truly yours,

LAW ENGINEERING TESTING COMPANY

Jimmy N. Smith, P. E.
Senior Geotechnical Engineer

Neil J. Gilbert, P. E.
Senior Engineering Geologist

JNS/NJG:kdh

Attachments

cc: Mr. Charles P. Brush
Koppers Company

Koppers Company, Inc., Law Department
436 Seventh Avenue, Pittsburgh, PA 15219
Telephone 412-227-2000
Telex: 0866418, Koppersco

KOPPERS

October 9, 1984

Mississippi Department of
Natural Resources
P. O. Box 20305
Jackson, Mississippi 39209
Attention: John Harper

Re: Koppers Company, Inc. in
Grenada County, Mississippi

Dear Mr. Harper:

This will confirm our phone conversation of this morning in which you agreed to excuse us from appearing before the Mississippi Commission of Natural Resources on October 10, 1984 in view of our agreement to pay a fine to dispose of our violation of Commission Order Number 705-84. The fine is $2,000.00 which we agree to pay upon receipt of specific request from you. We understand that there will be an additional fine of $8,000.00 should we fail to comply with the following schedule unless we can explain to your satisfaction that we have been prevented from so doing by causes beyond our control.

We have been delayed in our efforts to complete the B application permit by our inability to secure an adequate typographical map. I am advised that this map is now expected to be in our hands within 5 weeks from today or on November 13, 1984. On that date we will give you an interim report on the progress of our work.

We have scheduled an additional 2 weeks or until November 27, 1984 for carrying out the permeability tests of the soil, an additional week after that or until December 4, 1984 to determine what boring is required and an additional 2 weeks after that or until December 18, 1984 to complete all borings. On that date we will give you an interim progress report.

We have scheduled 3 additional weeks or until January 8, 1985 to complete sampling and analysis thereof of water from the wells and an additional 3 weeks after that or until January 29, 1985 to put together a complete package and get it delivered to you.

Should the agency decide that further work is involved, we will consider such additional work as Phase II and present you with a

Writer's Direct Dial Number 412-227-2636

FILE COPY

September 25, 1984

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Charles Brush
Koppers Company, Inc.
Environmental Resources Department
Pittsburgh, Pennsylvania 15219

Dear Mr. Brush:

Re: Operations in Grenada County
Mississippi

Under the authority of Section 49-17-31 of the Mississippi Code, the Mississippi Commission on Natural Resources hereby causes this written complaint to be served on Koppers Company, Inc.

Investigations by the Bureau of Pollution Control have revealed that Koppers Company, Inc., is in apparent violation of Commission Order Number 705-84 issued May 9, 1984, as amended on August 8, 1984. Specifically, Koppers Company, Inc., has failed to submit a complete Part B permit application in accordance with the Mississippi Hazardous Waste Management Regulations and as required by the aforementioned Commission Order.

Koppers Company, Inc., is therefore notified to appear before the Mississippi Commission on Natural Resources on the 10th day of October, 1984, at 9:30 a.m., in the conference room of the Commission in the Southport Center Building, 2380 Highway 80 West, Jackson, Mississippi, where Koppers Company, Inc., will be heard by the Commission.

You have the right to be accompanied by your legal counsel and such witnesses as you deem necessary in presenting your defense. This will be a formal hearing, and all testimony will be taken under oath as in a courtroom trial. The Commission is empowered to levy penalties of up to $25,000.00 per day per violation, and any appeal of the Commission's decision will be to the chancery court.

Attached you will find a copy of the Commission's hearing procedures and also a copy of frequently asked questions regarding hearings. We urge you to review these documents carefully.

If you have any questions regarding this matter, please contact us.

Yours very truly,

Charlie L. Blalock
Executive Director

Exhibit "1"
10-10-84

CLB:JWH:hdb

Koppers Company, Inc.
Environmental Resources and Occupational Health
Pittsburgh, PA 15219. Telephone [illegible]7-2877

KOPPERS

Charles P. Brush
Manager
Environmental Planning
and Regulatory Analysis

FEDERAL EXPRESS

September 11, 1984

Mr. Jack M. McMillan, Director
Division of Solid Waste Management
Bureau of Pollution Control
P. O. Box 20305
Jackson, MS 39209

RE: Koppers Company, Inc.
Tie Plant (Grenada), Mississippi
EPA I.D.#MSD007027543
Your Letters of July 5, 1984
July 19, 1984
August 2, 1984 and
Commission Order No. 705 84

Dear Mr. McMillan:

This letter and its attachments respond to your requirements of Koppers as addressed in the above letters and notice. The issues are inter-related and similar in some areas. They will be addressed in order of request.

Letter of July 5, 1984 - Received July 9, 1984

Item

1. March 19, 1984 Deficiency Letter

   Reply - This area will be addressed at the end of this letter and in the attachments.

2. Non-compliance with Section 265.93(d). Assessment Plan required within 15 days.

   Reply - Koppers paid a $4,000 fine for the non-compliance. Koppers prepared an Assessment Plan which was submitted (mailed) on the 15th day (July 16, 1984).

2c. Well construction date on or before August 15, 1984.

   Reply - Five new wells as described in the Assessment Plan were installed by July 17, 1984.

2d. Sample existing wells before August 1, 1984.

   Reply - Wells R1, R2, R3, and R4 were sampled on July 17, 1984.

2e. Koppers to sample bi-monthly - specific parameters listed.

   Reply - Koppers letter of August 14, 1984 responds to acknowledge

bi-month (every other month) samples for four (4) sets of analysis and describes in detail the analysis to be conducted.

3. March 19, 1984 deficiency letter as per Item (1) above.

Reply - This area will be addressed at the end of this letter and in the attachments.

4. September 12, 1984 date for submission of:

4a. Analysis of Btu value of sludge being burned in boiler.

Reply - Analysis were submitted in August 14, 1984 letter. Values ranged between 6,184 and 9,982 Btu/lb for waste on sited and 7,413 and 10,945 for waste being sent to the site.

4b. Analysis of wastewater being sprayed on spray irrigation field.

Reply - Water samples were taken on July 17, 1984 and received July 18, 1984 by Koppers Environmental Laboratory. As of this date, the analysis have not been received.*

4c. Analysis of soil in spray irrigation field.

Reply - Soil samples were taken on July 17, 1984 and forwarded shortly thereafter to Mead Compu-Chem Laboratories for analysis. As of this date, the analysis have not been received.*

4d. Analysis of sludge in the Surface Impoundment.

Reply - Sludge samples were taken on July 17, 1984 and forwarded shortly thereafter to Mead Compu-Chem Laboratories for analysis. As of this date, the analysis have not been received.*

*The analysis will be forwarded to you upon their receipt in our office. I have been advised that Koppers own laboratory and outside laboratories are working with very large backlogs.

<u>Letter of July 19, 1984 - Received July 16, 1984</u>

Item

1. Waste Analysis - Btu analysis of sludge being burned to be submitted before September 12, 1984.

Reply - On August 14, 1984 Koppers replied with the analysis of five samples taken on-site and two analysis of waste being sent to this plant. The range was from a low of 6,184 Btu/lb to 10,945 Btu/lb of waste. Koppers also enclosed a Freedom of Information Reply from the US EPA

which address all that they know about the burning of wood treating waste in wood-fired boilers.

5. Koppers is directed to submit an Assessment Plan by July 15, 1984.

   Reply - July 15, 1984 is a Sunday and Koppers expressed mailed the Assessment Plan on July 16, 1984 the date due.

8. Storage in Tanks

   Reply - Koppers is addressing inclusion of the oil/water separator tanks in Part A and Part B Applications and has asked its consultants to include it in their work plan.

9. Spray Field - Submit analysis of soil and water by September 12, 1984.

   Reply - Koppers took samples on July 17, 1984 of both soil and spray water. As of the date of this letter, analysis have not been received from the laboratories. The analysis will be forwarded to you upon its receipt in our office.

Letter of August 2, 1984 - Received August 6, 1984

2. Bio-monthly sampling to accelerate the development of data.

   Reply - Koppers agrees and replies with respect to sampling schedule and analysis schedule in August 14, 1984 letter.

3. Up-gradient well location is questioned.

   Reply - Koppers agrees and replies in August 14th letter. The location is not easily established and our consultants are investigating. See attached letter from Law Engineering Testing Co.

4. Design and screening of wells is questioned.

   Reply - It has been Koppers' experience that, under most hydrogeologic conditions, lagoon monitoring such as existed, and as were installed for the Assessment Plan will detect the leakage of contaminates from the lagoon. Creosote is a mixture of PAH's which have a wide solubility range between 31,700 ug/kg and 0.26 ug/kg. (Schwarz and Wasik, 1976, Eganhouse and Calder, 1976; and Mackay et at., 1980). See attachment A of this letter. To consider only that creosote is heavier than water, is to dismiss the central theme of how groundwater wastes interact. The Appendix VII list of PAH's recognizes the differences in solubility of creosote's constituents.

   Koppers has also asked its consultants to address this issue directly with you at a meeting to be scheduled.

Order 70584 - August 13, 1984

1. March deficiency letter.

   Reply - This area will be addressed at the end of this letter and in our consultants reply.

2. Implement the Groundwater Assessment Plan submitted July 16, 1984, as amended August 2, 1984.

2a. Install up-gradient monitoring that is unaffected by past practices at site.

   Reply - Koppers has directed its consultant to address the location of such a well(s). It is not clear to expert geologists and hydrogeologists where such a well might be located.

   Koppers indicated this situation to the Bureau in its August 14, 1984 letter and asked that our efforts to find the correct location be accepted as evidence of compliance with the Order and that modifications and course changes as recommended by our consultants will be made as soon as the information is available. In addition to retaining consultants, Koppers has issued a purchase order for very detailed aerial mapping of the area to assist in this work. (P.O. 310-4-11003). (See Consultants Reply).

2b&c. Install three down gradient wells at the point of compliance which monitor the uppermost aquifer before August 15, 1984.

   Reply - Four new, point of compliance wells (R6, R7, R8 and R9) were installed on July 17, 1984. The issue of uppermost aquifer is addressed in Attachment B, a Certified Hydrogeologist's certification of well installation and uppermost acquifer location.

2d. Groundwater monitoring to commence on or about August 29, 1984 and continue in accordance with the Bureau's letter of August 2, 1984 letter.

   Reply - Koppers point of compliance wells R6, R7, R8 and R9 were sampled on August 16, 1984. Mechanical difficulty was experienced with well R5 and a resampling effort is beginning at the time this letter is written. Schedule of re-sampling and analysis is shown in our August 14th reply.

3. Submit a report from a Certified Hydrogeologist that the above wells were installed and technically adequate to monitor the uppermost aquifer.

   Reply - See Attachment B for Certificate.

March 19, 1984

Issue #1

The Department expresses a position that the groundwater monitoring system is inadequate. In particular it comments on:

a) location of monitoring wells
b) lack of data Appendix VIII constituents
c) insufficiently characterized uppermost aquifer
d) student-t-test done incorrectly
e) lack of clarity about a detection or compliance monitoring program was present.

Reply - Koppers generally disagrees with the Department's position on a and b, and believes the Department is confusing Part A requirements with Part B requirements for the impoundment. Koppers has directed its consultants to address issues a, b, c and e in its groundwater investigative efforts at this facility. Koppers has addressed the Student-T-Test issue by the creation of new job position and computerization of the test for correct application of the test and rapid turn-around of results.

Issue #2

The Department believes the waste analysis plan is inadequate. In particular it comments on the lack of documented data on sludge generated at Tie Plant and incoming shipments. The Department also asked that Koppers demonstrate that waste being recycled in the wood-fired boiler as fuel meet the criteria for fuel.

Reply - Koppers has improved its testing and records procedure for demonstrating the fuel value of waste being burned at the wood-fired boiler. Analysis for Btu value for on-site waste and waste being shipped to the plant were submitted in our August 14, 1984 letter. All of the data indicated the Btu values were well into the acceptable range for fuel.

Samples of impoundment wastewater effluent, impoundment sludge and spray irrigation field soil have been taken and analysis are expected durilng early September, 1984.

Enclosed is a revised Waste Analysis Plan.

Issue #3

The Department expresses "serious" reservations concerning the current practice of spray irrigation. It recommends that Koppers' document that the wastewater being sprayed does not contain any of the hazardous constituents, and further it does not contain any other constituents of Appendix VIII.

Reply - Koppers position has been articulated in several discussions with the Department, leading to the Department's issuance of a request for samples of impoundment sludge, effluent spray water and irrigation field soil. The samples have been taken and the analysis will be sent to the Department upon their receipt.

Koppers operates several similar impoundment/spray irrigation systems in several other states where no-discharge and NPDES Permit conditions regulate the activity. The effluent from the impoundment does contain constituents found in Appendix VII and Appendix VIII. It is our position that the wastewaters are biologically treated in the soils of the spray field and that K001 sludges are not applied to the field for treatment. Enclosed is a copy of "Treating Wood Preserving Plant Wastewater by Chemial and Biological Methods, ES&E, September 1976, PB265454. It reviews performance of a similar Koppers facility where wastewaters are spray irrigated for treatment (pages 32 thru 37). The report indicates the average phenol removal is 99 + percent, and COD removal was 97 + percent. Similar literature is available from other studies.

US EPA regulations and headquarter's policy do not define the wastewater as hazardous. We are aware, however, that US EPA, Region VI wants to change EPA policy and regulation in this area to identify the water as well as the sludge as hazardous.

Issue #4 - other

The initial Part B Application was reviewed and the department has developed a list of required changes and improvements for Security, Contingency Plan, Training, Preparedness and Prevention, Container Storage, Closure Plan, Post-Closure Plan and Financial Requirements.

With this letter we are submitting a revised Part B for the following sections:

Section C - Waste Characteristics

Section D - Process Information

Section F - Preparedness and Prevention

Section G - Contingency Plan

Section H - Personnel Training

Section I - Certain Information Associated with the Financial Requirements

Koppers has not yet completed the balance of this list. It has, however, retained a consultant and the attached letter from Law Engineering Testing Company outlines its schedule to complete the work not submitted with this letter.

To date Kopopers has received 11 Part B Application requests from the several states and the US EPA and does not have the internal resources to address them all simultaneously. Neither does Koppers have all of the geotechnical and other special skills needed to address the questions asked in the Groundwater Monitoring Program and the Closure Plan (many issues related to groundwater). Koppers, therefore requests the Department and the Mississippi Commission on Natural Resources Bureau of Pollution Control to extend its time for submission

of those sections of the application not completed by Koppers in accordance with the schedule suggested by Law Engineering Testing Company in the attached letter. Further, Koppers requests a meeting with the department to discuss the balance of work and review the proposed schedule.

Sincerely yours,

Charles P. Brush, P.E.

CPB:cg
Enclosures
A - Solubility of PAH's
B - Certification of Hydrogeologist
C - Treating Wood Preserving Plant Wastewater by Chemical and Biological Methods
D - Law Engineering Testing Company letter dated September 5, 1984
E - Section B, Figure 5

cc: T. A. Marr
R. C. Bartlow
Jimmy Smith - Law Engineering

Koppers Company, Inc.
Environmental Resources and Occupational Health
Pittsburgh, PA 15219, Telephone [illegible]7-2877

CERTIFIED MAIL

Charles P. Brush
Manager
Environmental Planning
and Regulatory Analysis

KOPPERS

August 14, 1984

Mr. Jack M. McMillan, Director
Division of Solid Waste Management
Mississippi Department of Natural Resources
Bureau of Pollution Control
P. O. Box 10385
Jackson, MS 39209

RE: Your Letter of August 2, 1984
MSD007027543
Grenada, Mississippi (Tie Plant)

Dear Mr. McMillan:

This is to acknowledge the above letter which we received on August 6, 1984. In general, the issues and questions you have advanced in that letter, the Assessment Plan and the requirements for completion of the "Part B" Application, have complicated the technical and regulatory issues to the extent that Koppers has retained the consulting firm of Law Engineering Testing Company to assist it in responding fully to your requests and meeting our obligations. In particular, I have asked Law to respond to issues (3) and (4) of your letter of August 2, 1984 concerning location of the up gradient well and the design of the wells. This work is in addition to a general review of the overall Assessment Plan itself.

New wells, as shown in the Assessment Plan, were drilled and installed on July 16, 17, and 18, 1984. Logs are presently being prepared to document the location, method of construction and screening. When completed, they will be shared with you and Law. Your letter of July 5, 1984 at 2(c) implied an urgency in moving forward with new well construction and the sampling program. This work does not preclude additional wells and sampling that may be suggested by the Consultant.

Law is already at work addressing the deficiencies of the "Part B" Application.

With respect to sampling, I believe we had planned to sample and analyze in accordance with NHWMR 265.92(c), four times on a bi-monthly basis. Specifically, our technical section has been given instructions as follows:

	EXISTING WELLS				NEW ASSESSMENT WELLS			
Parameters*	Schedule				Schedule			
	1st	2nd	3th	4th	1st	2nd	3th	4th
Indicator**	X	X	X	X	X	X	X	X
Groundwater	X	X	X	X	X	X	X	X
Drinking Water	X	X	X	X	X	X	X	X
Appendix VII	X	X	X	X	X	X	X	X

*Indicator Parameters

pH
Specific Conductance
Total Organic Carbon
Total Organic Halogen

Groundwater Parameters

Chloride
Iron
Manganese
Phenols
Sodium
Sulfate

Drinking Water

Arsenic thru Coliform Bacteria in accordance with Appendix III.

Appendix VII

K001 Constituents

**Each of the indicator parameters, at least four replicated measurements, shall be made for each sample.

Your letter of August 2, 1984 ends with a request to modify the Plan before the August 15, 1984 deadline but, our new wells will have already been installed and the first round of sampling taken before the August 15, 1984 deadline. We recoganize that issues raised in Items 3 and 4 of your letter have not been resolved. We, therefore, ask that you accept our efforts to date as evidence of compliance and that you consider Items 3 and 4 as on-line modifications and course changes to be made

as our consultant investigates your specific concerns and makes recommendations concerning up gradient well placement and screening depths.

Sincerely yours,

Charles P. Brush

CPB:cg
cc: Ray Bartlow
Jimmy Smith - Law Engineering

FILE COPY

August 2, 1984

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Mr. Charles Brush, P. E.
Koppers Company, Inc.
Environmental Resources Department
Pittsburgh, Pennsylvania 15219

Dear Mr. Brush:

Re: MSD007027543

This letter responds to your letter of July 12, 1984, your assessment plan which was received on July 18, 1984, and corrects our previous interpretation of the requirements for the assessment program, which we submitted to you on July 5, 1984.

(1) We agree with your proposal to monitor both the existing wells and the new wells for hazardous constituents only, as defined by Appendix VII. However, should any of the wells indicate the presence of hazardous constituents in a concentration greater than one part per billion (ppb, or ug/l), Koppers would be required to complete the Appendix VIII scan in accordance with the attached guidance from EPA, Region IV. (NOTE: The Bureau has previously provided to you a list of constituents which could be reasonably believed to be in or derived from the waste. We will not be able to accept the priority pollutant scan.)

(2) We apparently misinterpreted the requirements set forth in MHWMR 265.92(c). Specifically, Koppers is required to develop background data for all wells on a quarterly basis for one year rather than a one-time sampling, as indicated in our July 5, 1984 letter. We wish to accelerate the development of this data; therefore, we want each of the wells sampled on a bi-monthly schedule for all of the required parameters contained in MHWMR 265.92(b)(1)-(3). (Note also the requirements for replicate sampling for the indicator parameters for the new upgradient well.)

(3) The Bureau questions the location of the new upgradient well. Insufficient information has been submitted to indicate whether placement of the well is sufficient to avoid post disposal and treatment practices. We suggest that a better location for the well would be nearer to the entrance of the facility.

(4) We question the design of the wells, specifically with regard to the screened interval of each well. Since many of the constituents contained within your waste are heavier than water, and it appears that the proposed wells will monitor only the upper portion of the water table aquifer, we believe that the system could be essentially ineffective for detecting leakage of heavier contaminants. Therefore, the new downgradient wells should be screened for the entire depth of the sand unit.

We regret the apparent misinformation we provided, but since each of these parameters required sampling, we hope that the inconvenience was not significant.

If you have any questions, please contact us. We will expect to receive a modified assessment plan with the changes identified above in time for construction of the new wells by the August 15, 1984 deadline.

Sincerely,

Jack M. McMillan, Director
Division of Solid Waste Management

JMM:FAR:hdb

Koppers Company, Inc., Forest Products Group
P.O. Box 160, Tie Plant, MS 38960
Telephone 601-226-4584

KOPPERS
Architectural and
Construction Materials

July 27, 1984

Ms. Dept. of Natural Resources
Bureau of Pollution Control
P. O. Box 10385
Jackson, Ms. 39209

ATTN: Mr. Jack McMillan

RE: MSD007027543

Dear Mr. McMillan:

Appendix D., referred to in item 8 of your July 19, 1984 letter is enclosed. I must not have included a copy with my June 13th letter. Please consider this information in your decision to require inclusion of the separator tanks in Part A.

If I can be of further assistance, please contact me.

Sincerely,

R. C. Bartlow
Plant Manager

RCB/djm

cc: C. P. Brush

Enclosure

K - DARLOW

KOPPERS

.Quagliotti
Smith
M. Urbassik
J. Dern
T. Marr - w/att

Interoffice Correspondence

To *MEMO TO STAFF From C. P. Brush

Location _____ Location K-12

Subject Regulation of Waste Water Facilities under RCRA Regulations Date May 23, 1984

In preparing several Part B Applications, both State and Federal Regulators have proposed to include water/oil separators as part of the permit for the RCRA Surface Impoundments (SI) which are the subject of the Application. As usual, it is difficult to draw the line between units within an operating plant.

I have, however, researched this area and believe I have determined when and where the line is drawn for RCRA facilities. It is important to re-read the Listing Background Document - Wood Preserving, 1980. A copy is attached. Note, however, that the wastewater from the process is not hazardous as was indicated in the B.D.

The process description begins on Page 146 and is shown in Figures 1a - 1e. It is significant to read the underlined statement on Page 152...."usually an oil/water emulsion." On Page 157 it is shown that the bottom sediment sludge (K001) is generated in the SI (i.e., spray ponds). The sludge is generated when the oil/water emulsion is broken upon standing in the ponds. Also, see Page 158 for another statement on the site where sludge is generated.

I conclude from a review of the B.D. on Wood Preserving that the Agency believed the Spray Ponds (S.I.) is the site where K001 is generated.

You should be alert to the confusion presented by the definition of "Wastewater Treatment Unit" found at § 260.10. That definition indicates wastewater treatment tanks which generate hazardous sludges, or treat hazardous waste waters are subject to RCRA permitting, except when permitted-by-rule for treatment or neutralization (FR Vol. 45, No. 223, Nov. 17, 1980, Pg. 76076).

This definition does not apply to our activities inasmuch as most of our systems are not regulated by Sections 402 and 307(b) of the CWA (as required by the definition) and the K001 sludge is not generated in other than the bottom of the impoundments.

A strict reading of § 265.19 (Subpart J-Tank), § 260.10 (definition) and the Background Document clearly indicate our oil/water separator systems are not within the definitions of RCRA which require permitting.

Charles P. Brush

K-5 REV 2 encl.

FILE COPY

July 24, 1984

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Charles Brush
Koppers Company, Inc.
Environmental Resources Department
Pittsburgh, Pennsylvania 15219

Dear Mr. Brush:

Re: Operations in Grenada County,
Mississippi

Under the authority of Section 49-17-31 of the Mississippi Code, the Mississippi Commission on Natural Resources hereby causes this written complaint to be served on Koppers Company, Inc.

Investigations by the Bureau of Pollution Control have revealed that Koppers Company, Inc. is in apparent violation of the Mississippi Hazardous Waste Management Regulations at its facility at Tie Plant, Mississippi. Specifically, Koppers Company, Inc. failed to notify the Executive Director in a timely manner of its findings indicating groundwater contamination or submit a groundwater assessment plan in a timely manner concerning said groundwater contamination, both actions being required by Section 265.93(d)(1) and 265.93(2) of the aforesaid regulations.

Koppers Company, Inc. is therefore notified to appear before the Mississippi Commission on Natural Resources on the 8th day of August, 1984, at 1:15 p.m., in the conference room of the Commission in the Southport Center Building, 2380 Highway 80 West, Jackson, Mississippi, where Koppers Company, Inc. will be heard by the Commission.

You have the right to be accompanied by your legal counsel and such witnesses as you deem necessary in presenting your defense. This will be a formal hearing, and all testimony will be taken under oath as in a courtroom trial. The Commission is empowered to levy penalties of up to $25,000.00 per day per violation, and any appeal of the Commission's decision will be to the chancery court.

If you have any questions regarding this matter, please contact us.

Yours very truly,

Charlie L. Blalock
Executive Director

CLB:JWH:els

Attachment 1.

IX. APPENDIX

PENALTY COMPUTATION WORKSHEET

Company Name: Koppers ~~Chemical~~ Inc

Regulation Violated 270.10.

Asessments for each violation should be determined on separate worksheets and totalled.

(If more space is needed, attach separate sheet.)

Part I - Seriousness of Violation Penalty

1. Potential for Harm: Moderate
2. Extent of Deviation: Major
3. Matrix Cell Range: 8,000 - 10,999

   Penalty Amount Chosen: 9500

   Justification for Penalty Amount Chosen: Application incomplete (midpoint of range)

4. Per-Day Assessment: 9500

Part II - Penalty Adjustments

	Percentage Change*	Dollar Amount
1. Good faith efforts to comply/lack of good faith:	+25%	2375
2. Degree of willfulness and/or negligence:	—	
3. History of noncompliance:	—	
4. Other unique factors:	—	

5. Justification for Adjustments: Failure to comply with commission order

* Percentage adjustments are applied to the dollar amount calculated on line 4, Part I.

PENALTY COMPUTATION WORKSHEET (cont.)

6. Adjusted Per-day Penalty (Line 4, Part I + Lines 1-4, Part II):	11,875
7. Number of Days of Violation:	NA
8. Multi-day Penalty (Number of days x Line 6, Part II):	NA
9. Economic Benefit of Noncompliance:	1650 ~~3300~~
Justification: See computation below	
10. Total (Lines 8 + 9, Part II):	13,525 ~~15,175~~
11. Ability to Pay Adjustment:	
Justification for Adjustment:	—
12. Total Penalty Amount (must not exceed $25,000 per day of violation):	13,525 ~~15,175~~

Economic benefit = Avoided Cost (1-T) + (Delayed cost × Interest)

Avoided Cost = 0.

Delayed Cost:

Cost of Complete Application ≈ $150,000

from Burden Hours for RCRA Cont Disposal Standards, 1983

Since initial application was submitted, assume that the remaining costs comprise 20% of original ⇒

$30,000

Interest rate - assume 11%

Benefit = (30,000) × ½(.11)

= $ ~~3300~~

= 1650.

FILE COPY

July 19, 1984

Mr. R. C. Bartlow
Koppers Company Inc.
Forest Products Group
P. O. Box 160
Tie Plant, Mississippi 38860

Dear Mr. Bartlow:

Re: MSD007027543

This letter is written in response to your letter of June 13, 1984. As you are aware, there has been some dialogue between our office at Mr. Charles Branch at your corporate office. In your letter, you responded to our inspection of April 26, 1984.

The following is a summary of the status of the interim-states violations:

1. Waste Analysis

   Koppers has been instructed to obtain BTU analysis of sludge being burned in the boiler and submit the results of this analysis by September 12, 1984. (letter; Herrmann to Brush, July 5, 1984)

2. Security

   Koppers has been instructed on how to revise its Part A for the proposed storage building. (letter; McMillan to Brush, June 12, 1984)

3. Annual Report

   The Annual Report was received on July 16, 1984. Koppers was required to submit the report on March 1.

4. Reporting

   The written report on the spill incident was received and is in order. However, we question its disposition by burning in the boiler without a BTU analysis.

5. Groundwater Monitoring

   Koppers is being required to submit a groundwater assessment plan by July 15, 1984. Koppers will be placed on an expedited schedule for sampling and will be required to perform hazardous constituent analysis. (letter; McMillan to Brush, July 5, 1984) The assessment plan was received July 18, 1984.

6. Container Storage

See #2 above.

7. Drum Leakage

We appreciate Koppers' recognizing the potential incompatibility between creosote waste and container gasket materials. The elimination of side bungs should eliminate potential leakage. We disagree with your distinction between "weeping" and "leaking"; however, the above remedy should make the point moot.

8. Storage in Tanks

We did not receive Appendix D, as alluded to in your letter. However, the Bureau's position is that the "flocculation" tanks do not meet the wastewater treatment unit exclusion, and therefore are subject to the RCRA tank standards. This position is based on the fact that the effluent from the treatment facility is not subject to NPDES or pretreatment standards, but instead is spray irrigated. Since the effluent is not discharged to a POTW or to surface waters of the State, MHWMR 260.10 (76)(a)i, which is a necessary condition in order to meet the exclusion of MHWMR 265.1, is not met.

Furthermore, the Bureau believes that there are sound environmental reasons to regulate those tanks. During the inspection, it was noted that the freeboard was significantly less than two feet. Furthermore, the tanks are not routinely inspected for leakage, or drained to determine the structural integrity of the units. Since these units generate the K001 sludge which is regulated in the impoundment, we believe that the units should be regulated. The Part A should be amended to reflect inclusion of these tanks within 30 days.

9. Spray Field

Koppers is being required to submit analysis of the soil in the spray field, as well as effluent being sprayed in the spray field. In conjunction with the analysis of the sludge, the Bureau will determine the appropriate mechanism for regulating this activity (ie., whether it be hazardous waste, nonhazardous waste, or under the industrial wastewater program). This analysis is being required by September 12, 1984 (letter, McMillan to Brush, July 5, 1984)

If we can be of further assistance, do not hesitate to contact us.

Sincerely,

Jack McMillan, Director
Division of Solid Waste Management

JMc:JH:cl
Attachments
cc: Mr. Charles Brush, P.E., Koppers, Pittsburgh, PA

Koppers Company, Inc.
Environmental Resources and Occupational Health
Pittsburgh, PA 15219, Telephone 412-227-2877

KOPPERS

Charles P. Brush
Manager
Environmental Planning
and Regulatory Analysis

July 16, 1984

Mr. Jack M. McMillan
Mississippi Department of Natural Resources
Bureau of Pollution Control
P. O. Box 10385
Jackson, MS. 39209

RE: Groundwater Assessment Plan
MSD 007027543

Dear Mr. McMillan:

In accordance with your letter of July 5, 1984, Koppers herewith submits its Groundwater Assessment Plan. Your immediate review and comments are requested because Koppers' drilling crews are expected to begin site work on July 17, 1984.

You are also advised that Koppers has retained Law Engineering to assist it in completion of the Part B Application.

Sincerely yours,

Charles P. Brush

Charles P. Brush, P.E.

CPB/s
encl.

PROPOSAL FOR A GROUNDWATER ASSESSMENT PLAN
KOPPERS COMPANY, INC.
GRENADA, MISSISSIPPI

1.0 HYDROGEOLOGIC SETTING

The lagoon area at the Grenada plant is situated on a surficial layer of clays and silts which ranges from 6 to 12 feet in thickness. A Shelby Tube sample collected in this unit at R-1 showed a laboratory permeability of 3.9×10^{-8} cm/sec.

A sand unit underlies the silts and clays to the termination depth of the monitoring wells. This unit is dry at the top, with the saturated zone beginning at a depth of approximately 20 feet. Groundwater flow in this unit is generally from south to north.

2.0 PROPOSED WORK SCOPE

2.1 Monitoring Wells

A total of five additional wells will be installed at the site; four of these will be "point of compliance" wells, and the fifth well will be for background purposes. These wells will be installed at the locations indicated on Figure 1. Well construction will be similar to the existing RCRA wells; details are illustrated in Figure 2. Spilt-spoon soil samples will be collected during drilling at 2.5-foot intervals to a depth of 15 feet and 5 foot intervals thereafater. These samples will be classified in the field and retained by Koppers.

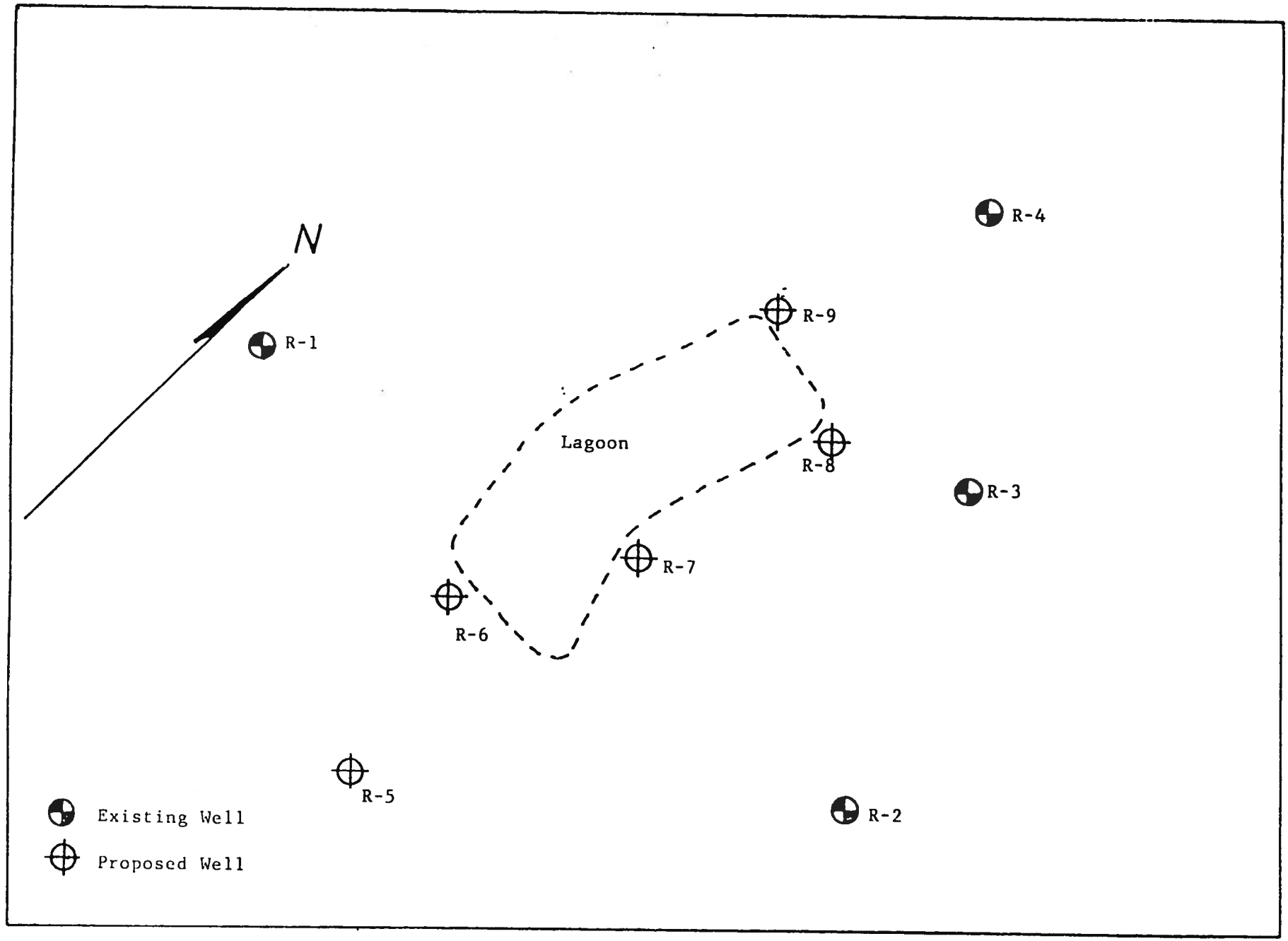


FIGURE 1: WELL LOCATION DIAGRAM

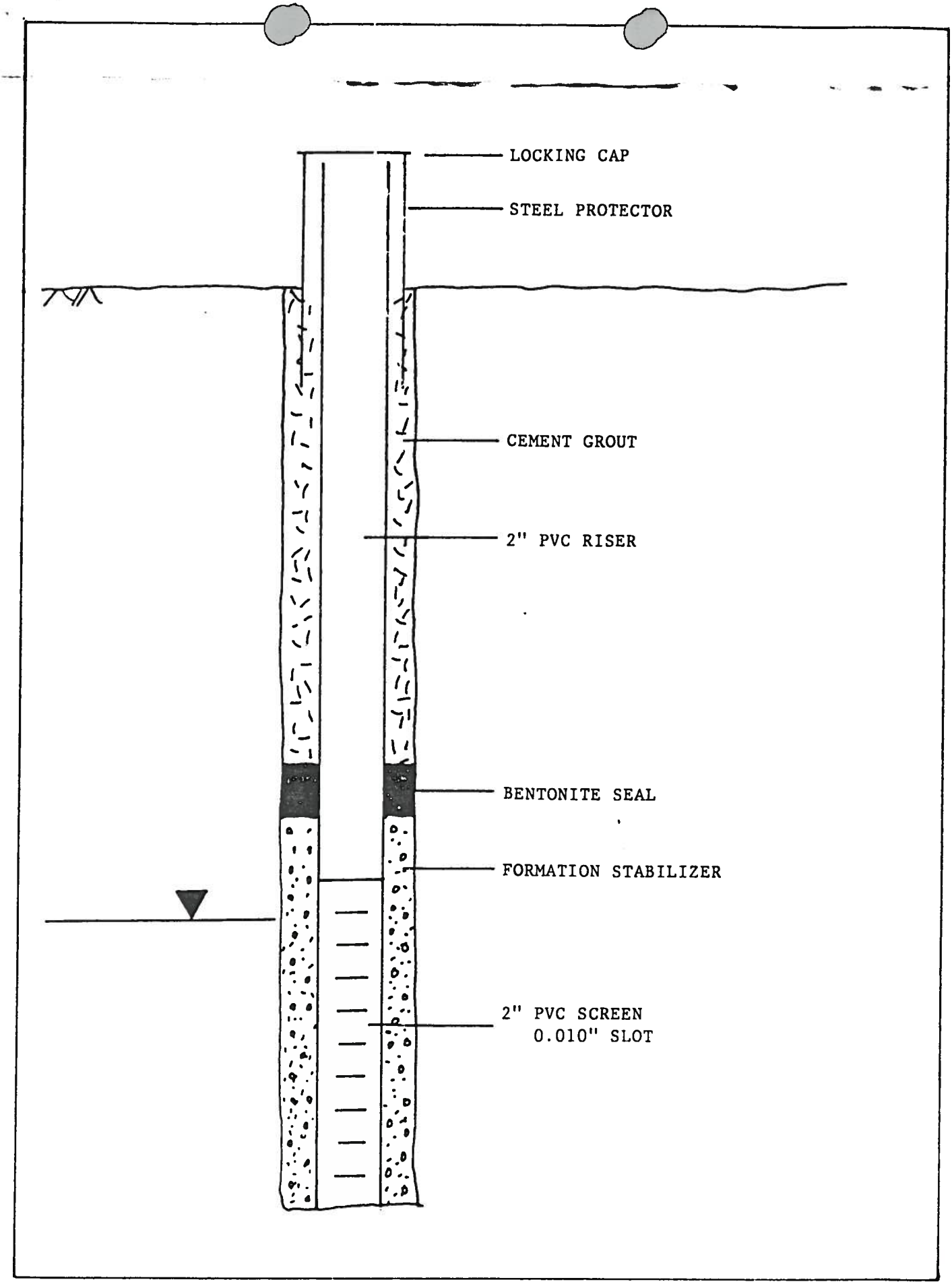


FIGURE 2: WELL CONSTRUCTION DETAILS

2.2 Groundwater Sampling

The existing RCRA wells (R-1 through R-4) will be sampled in accordance with the July 5, 1984 letter from the MBPC. This sampling program is summarized in Table 1.

The proposed wells will also be sampled in accordance with the July 5, 1984 letter, with the exception that the priority pollutant scan will be replaced with an analysis for K001 constituents. The sampling program for the new wells is summarized in Table 2.

3.0 PROJECT SCHEDULE

Installation of the additional wells will take place on or before August 15, 1984. Sampling of these wells will begin approximately two weeks after the completion of the well installation. The existing wells will be sampled on or before August 1, 1984.

David R. Kerschner
Hydrogeologist
7/12/84

DRK:ss

TABLE 2

SAMPLING PROGRAM
PROPOSED WELLS
GRENADA, MISSISSIPPI

Indicator Parameters - Bimonthly for Four Samplings

pH
Conductivity
Total Organic Carbon (TOC)
Total Organic Halogens (TOX)

Hazardous Constituents (K001) - Bimonthly for Four Samplings

Pentachlorophenol
Phenol
2-chlorophenol
p-chloro-m-cresol
2,4-dimethylphenyl
2,4-dinitrophenol
trichlorophenols
tetrachlorophenols
Chlorine
Naphthalene
Fluoranthene
Benzo-(b)fluoranthene
benzo(a)pyrene
indeno(1,2,3-cd)pyrene
benz(a)anthracene
dibenz(a)anthracene
acenaphthalene

Groundwater Quality Parameters-Once: Annually Thereafter

Chloride
Iron
Manganese
Phenols
Sodium
Sulfate

Groundwater Primary Drinking Water Parameters-One Sampling

Arsenic
Barium
Chromium
Cadmium
Fluoride
Lead
Mercury
Nitrate as N
Selenium
Silver
Endrin
Lindane
Methoxchlor
Toxaphene
2,4-D
Coliform
2,4,5-TP Silvex
Gross Radium-226
Gross Radium-228
Gross Alpha
Gross Beta
Turbidity

Koppers Company, Inc.
Environmental Resources and Occupational Health
Pittsburgh, PA 15219, Telephone 412-227-2877

KOPPERS

Charles P. Brush
Manager
Environmental Planning
and Regulatory Analysis

CERTIFIED MAIL

July 12, 1984

Mr. Jack M. McMillan
Mississippi Department of Natural Resources
Bureau of Pollution Control
P. O. Box 10385
Jackson, MS 39209

RE: Your Letter of July 5, 1984
MSD007027543

Dear Mr. McMillan:

We are in receipt of your letter of July 5 and intend to comply with the July 15, 1984 date for submission of a groundwater assessment plan. We have initially reviewed the other requests and are planning for this implementation.

We request that you reconsider "e(ii) -- Hazardous constituents (priority pollutant scan)", sampled biomonthly. To achieve the desired level of information we believe you want, we suggest sampling for Appendix VII constituents of K001, four times on a bimonthly basis. Both (e) and (f) requests address sampling of the new wells and represent a significant amount of analysis. Your comments are requested.

Sincerely yours,

Charles P. Brush, P.E.

CPB:cg

cc: T. A. Marr
R. C. Bartlow
J. A. Quagliotti
D. R. Kerschener

FILE COPY

July 5, 1984

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Charles Brush, P. E.
Koppers Company, Inc.
Environmental Resources Department
Pittsburgh, Pennsylvania 15219

Dear Mr. Brush:

Re: MSD007027543
Tie Plant, Mississippi

This letter follows-up our teleconference on June 29, 1984. The purpose of the conversation was to discuss Koppers status with regard to Commission Order No. 705-84 (issued May 9, 1984) and the interim status standards, particularly the groundwater monitoring requirements, contained with Part 265 of the Mississippi Hazardous Waste Management Regulations.

The following is a summary of the points made during the conversation:

1. The Bureau disagrees with Koppers apparent assertion that the bulk of the items raised in the March 19, 1984 notice of deficiency letter could not feasibly be addressed by June 15, 1984.

2. Koppers has not complied with Section 265.93(d); i.e., the requirement to submit a groundwater assessment plan within 15 days of the confirmation of a statistical increase in the indicator parameters. Consequently, Koppers must submit a plan by July 15, 1984 which

   a. Describes the hydrogeological setting;

   b. Proposes the placement and construction details of new wells at the compliance point within the uppermost aquifer;

   c. Proposes a construction date for new wells on or before August 15;

   d. Identifies Koppers intent to sample the existing well system on or before August 1 for the following parameters:

      (i) Indicators (each well); background well replicates.

      (ii) Groundwater quality parameters (each well); to be done once annually, thereafter.

      (iii) Drinking water standards (each well); one time only.

(iv) Hazardous constituents (Appendix VII; BPC will settle for priority pollutant scan of acid, base/neutral, and volatiles).

e. Identifies Koppers intent to sample new wells on a bimonthly basis for the following parameters following construction:

(i) Indicator parameters; background well replicates.

(ii) Hazardous constituents (priority pollutant scan).

f. Identifies Koppers intent to sample the new wells for the following parameters:

(i) Groundwater quality parameters (once, annually).

(ii) Drinking water standards (one time only).

[It is understood that, should the above described sampling indicate that hazardous constituents are entering the groundwater from the regulated unit, Koppers will be required to ascertain further the extent and rate of migration of the plume as required by Section 265.93(d)(7)].

3. Koppers is to submit a revised Part B by September 12, 1984. The revised Part B is to address the deficiencies identified in the March 19, 1984 letter. These deficiencies included

a. Insufficient paperwork requirements; i.e., waste analysis plan, contingency plan, closure plan, post-closure contingency plan, security, training, container storage, and financial assurance.

4. By September 12, 1984, and with the revised Part B to which reference was made above, Koppers must submit the following:

a. Analysis of the sludge being burned in the boiler for BTU content (whether on-site or off-site).

b. Analysis of wastewater being spray irrigated. Note that the Bureau is requesting this analysis under Section 49-17-1, et. seq. (the State's Water Pollution Control Act) and Section 17-17-1 et. seq. (the State's Solid Waste Disposal Law). Such analysis shall include a screening of the priority pollutants therein, particularly those within Appendix VII (MHWMR 261).

c. Analysis of soil in the spray irrigation field. Analysis shall be conducted for the priority pollutants, particularly those in Appendix VII of MHWMR 261.

d. Analysis of sludge in the regulated unit for the priority pollutants, particularly those in Appendix VII of MHWMR.

Note that the Bureau intends to compare the concentrations of the constituents within (c) and (d) above to determine whether there is justification to regulate the spray field as a hazardous waste management unit (i.e., disposal of a listed hazardous waste).

In addition to requiring the above information, we expect that the Commission will have an enforcement hearing with Koppers in early August for the purpose of considering certain violations of interim status requirements. You will receive formal notice of this hearing soon.

At this enforcement hearing we expect to amend Order No. 705-84.

If you have any questions about this matter, please advise.

Sincerely,

Jack M. McMillan, Director
Division of Solid Waste Management

JMM:JH:els

Draft
Internal
letter not

Mr. Charles Brush, P.E.
Koppers Company Inc.
Environmental Resources Dept.
Pittsburgh, PA 15219.

Re: MSD 017027543 (Tie Plant, MS)

Dear Mr. Brush,

This letter is written in response to letters from you to Mr. Jack McMillan, dated June 12, 1984, and from Mr. R.C. Barlow to Mr McMillan, dated June 13, 1984. In general, it is the Bureau's position that Koppers Company has failed to demonstrate good faith efforts, either to comply with the Commission's Order # 70584, or to comply with the interim status standards, set forth in Mississippi Hazardous Waste Management Regulations, Part 265. Therefore, the Bureau plans to schedule a hearing before the Commission on Natural Resources at its regularly ~~scheduled~~ meeting in August, which is tentatively scheduled for August 8, 1984. ~~If desired, Koppers may request to appear for an informal meeting in order to show cause why the enforcement action should not be taken.~~ before the Executive Director prior to the hearing date.

The basis for the contemplated enforcement action is as follows:

~~Regulatory cite~~

(a) Regulatory cite: 270.10 (e)

Background:

On July 5, 1983 Koppers was requested to submit Part B of its permit application. The company submitted its application on January 11, 1984 The company was sent a notice of deficiency on March 19, 1984 and was required to resubmit a corrected application by April 30, 1984. ~~The Commission~~ Koppers submitted a schedule which set forth the submission of an application on or about February 15, 1985. The Commission issued an order which required the submission of an application by June 15, 1984 with an acceptable schedule which would develop the necessary information for inclusion in a permit. On June 12, 1984 Koppers responded with a ~~schedule~~ letter which did not include a ~~per~~ revision to the permit application, but rather set forth a schedule which would not provide for the installation of acceptable ~~wells~~ monitoring wells until November, 1984. This in effect would necessitate the development of background groundwater quality throughout 1985 and would effectively ~~prevent~~ foster final action on the permit application until March of 1986.

Bureau's recommendation:

The time frame proposed by Koppers is unreasonable. There is no reason as to why Koppers could not proceed with the revisions required by the March 19, 1984, with respect to the operating plans and procedures, e.g, the closure plan, contingency plan, etc A penalty, in accordance with the Bureau's penalty policy,

(b) Regulatory cite: 265.90-94.

Background:

The Koppers facility installed groundwater monitoring wells and has been conducting sampling of the wells since March 30, 1982. As a result of an inspection on April 26, 1984 Koppers was notified of the presence of a significant increase in indicator parameters based on the October 17, 1983 samples. Koppers failed to notify the Bureau pursuant to HWMR 265.93 nor did Koppers take the appropriate response actions, including but not limited to conducting resampling and/or submitting a groundwater assessment plan. In fact, Koppers anticipates taking no such actions until at least October, 1984. In addition Koppers has failed to take the required samples and develop the appropriate background groundwater quality data necessary for permitting

Bureau's recommendation:

The Bureau believes that the facility may be affecting groundwater quality and therefore should be conducting a complete assessment. In addition, the Koppos has not indicated a willingness for expeditiously installing and monitoring groundwater quality at the point of compliance There is no excuse for the lack of taking samples for the required parameters or for reporting the significant increase. A penalty is recommended,

The Bureau is at this time reserving judgment on the following issues:

(a) whether the land treatment unit is regulated under the hazardous waste regulations. However the Bureau is concerned with Koppers' demonstrated unwillingness to sample the wastewaters being spray irrigated; the Bureau has requested an interpretation from EPA as to whether these wastewaters should be considered hazardous under the mixture rule.

(b) Whether burning of sludge constitutes legitimate reuse. The Bureau is concerned with the delay until September in conducting the appropriate sampling and analysis for Btu content.

(c) whether Koppers should be penalized for storage of waste in an unauthorized area. The requested change during interim status was not considered sufficiently detailed in order to make a final judgment.

The Bureau believes that Koppers Company Inc, by virtue of delaying the submittal of its Part B and failing to conduct the required groundwater monitoring and reporting has not only gained an economic advantage through non-compliance, but has also posed a substantial risk to groundwaters of the State.

If you have any questions regarding the above items, don't
Jack McMillan of my staff
[illegible]

Sincerely

~~Joshua~~ Charles Chivian, Director
Bureau of Pollution Control.

Koppers Company, Inc., Forest Products Group
P.O. Box 160, Tie Plant, MS 38960
Telephone 601-226-4584

KOPPERS
Architectural and
Construction Materials

June 13, 1984

Mr. Jack M. McMillan, Director
Bureau of Pollution Control
Division of Solid Waste Management
Mississippi Dept. of Natural Resources
P. O. Box 10385
Jackson, Ms. 39209

RE: Your letter of May 8, 1984
MSD 007027543

Dear Mr. McMillan:

This letter is in reply to your letter of May 8, 1984 calling our attention to several items noted during Mr. John Herrmann's inspection of April 26, 1984. The items are addressed in the same order as the letter.

1. Waste Analysis - Until this time Koppers has relied upon initial analysis and field tests at this boiler and BTU analysis conducted on "representative" samples of wastes generated at other Koppers' facilities, some of which have been sent to this plant for use in our boiler. However, we will sample at least 10% of the existing waste being held on site (at least 5 samples), and send you the results. Further, Koppers has implemented a policy of not shipping any waste to this boiler until representative BTU analyses have been conducted, the results accompany the waste and then remain in our plant's records. Samples of this plant's waste will also be analyzed on a regular basis and the results put into the plant's records. Copies of past analyses shall also be placed in the plant file.

   Although we are committing to the above methods of analysis and recordkeeping as the proper regulatory procedure, we believe that our analysis to date, and the physical nature and appearance of our waste insures that our use of wood treating wastes do constitute a proper recycling of the materials. For your information, Appendix A is attached, and illustrates Koppers' efforts to date to develop wood waste-fired cogeneration facilities throughout the U.S.

(Cont'd)

2. Security - In our discussions with Mr. Herrmann we learned how to go about getting regulatory approval to proceed with construction of our proposed waste storage building. You have, or will shortly, receive an amended Part A wherein we outline the size and cost of a 32' x 32' steel building to be located near our boiler facility. We intend to invite bids for construction of the building within 45 days of approval of the amended Part A and to begin construction of the foundations within 45 days thereafter. We trust that this objective and our schedule is acceptable to you.

3. Annual Report - The annual report is being compiled and will be forwarded to your office as soon as possible.

4. Reporting - Enclosed is my written report to corporate headquarters of 2/28/84. Be advised further that the Ms. Dept. of Natural Resources (Mr. Bob Rogers), was telephoned on 2-28-84 at 11:45 a.m. and that the National Response Center was telephoned (Mr. Ambrozewicz), at 12:45 p.m. the same day.

   The waste generated in this event was creosote solution from an active treating cylinder, and dirt and the sawdust used to pick up the waste oil. Based upon our use of specification grade creosote we know this waste to be EPA-U051 without testing.

5. Groundwater Monitoring - Koppers acknowledges difficulties in providing you with the proper data for groundwater monitoring. In order to rectify this matter, Koppers is doing the following:

   a. The sampling for indicator parameters shall be done with the required replicates over the next four quarters, starting with the third quarter of 1984. Thereafter, the well shall be sampled semi-annually.

   b. Drinking water and indicator parameters will be sampled in accordance with a schedule to be submitted withing a few weeks.

      A Student t statistical analysis of existing data is enclosed in Appendix B of this reply.

   c. Your concern for the up-gradient well is acknowledged. Koppers' hydrogeologists will be sending Mr. John Herrmann a detailed proposal on relocation of wells and/or other means to address your concerns.

(Cont'd)

d. We believe "point of compliance" monitoring wells are not subject, nor appropriate to Interim Status Regulation. However, we will be addressing the location of such wells with you in the near future as we move to comply with the recent Order on the Part B Permit. It is our intent to address relocation of the Part A up-gradient monitoring well with the location of Part B "point of compliance" wells.

6. Container Storage - See reply to Item 2 above. We believe the construction of a new drum storage building near the boiler building will resolve this matter.

7. Drum Seepage - We believe that neither the lid or seepage items are a significant factor. The two drums were covered (unsealed lids) and were being used to collect process waste and clean-up around the boiler-waste feeder area. Further, we believe that the side bung hole showed only weeping (even PCB transformers are allowed to weep) and was not leaking. However, your concerns about side bung holes is noted and Koppers is taking steps to eliminate the use of (DOT Approved) drums which have side bungs. Creosote oil (and the drums contain waste with a very fraction of oil) is very aggressive toward most synthetic liners and gasket substances.

8. Storage in Tanks - After our meeting on April 26, 1984, Koppers reviewed the regulatory status of the "flocculation" tanks used to provide oil/water separation. After our detailed review (see Appendix D, Charles Brush letter dated May 23, 1984, and US EPA Background Document), it is our opinion that the tanks are not subject to regulation under RCRA Regulations.

   We welcome your comments if you believe otherwise after reading our review.

Other Issues:

When inspected on April 26, 1984, the spray fields were in what is perhaps the worst phase of the seasonal cycles they experience. The local area had received 2½ inches of rain in the 14 days preceding the visit. Year-to-date rainfall had been 22 inches. With respect to odor, the entire site is subject to the odors common to wood preserving and we attribute no significant environmental or health effects to odors. To support this position we site the Journal of Applied Toxicology-December, 1983-Odor as an Aid to Chemical Safety. (Copy Attached.) The fact that the soil indicated no significant build-up of sludge (our photographs suggest only trace amounts of froth from the surface of the spray pond) indicated no K001 sludge is being applied to the field.

(Cont'd)

With respect to recommended sampling and analysis of wastewaters for K001 constituent and the possible permitting as a hazardous waste management facility, Koppers declines to follow the recommendations. Koppers' position is that the wastewaters are not subject to RCRA permitting and that analysis for K001 constituents would not indicate the presence or absence of K001 Bottom Sludge in the water being applied to the fields.

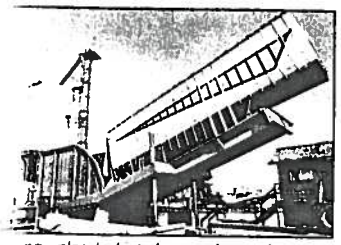
We hope that this reply to your citation has been forthright and meets with your approval. Again, with respect to monitoring wells, we expect to be dealing with your office on a continuing basis to resolve your concerns and to support our Part B Application.

Sincerely yours,

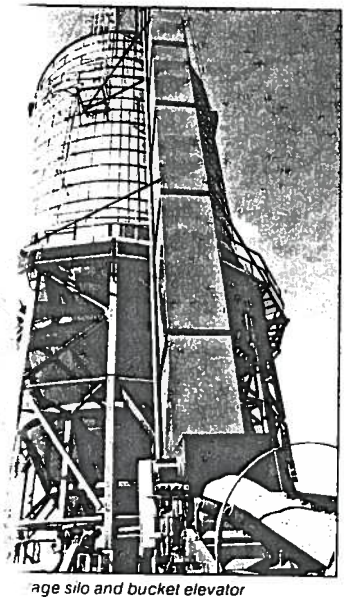
R. C. Bartlow

encl. Appendix A - Koppers Cogeneration Plants
Appendix B - Student t Test
Article - Odor As An Aid to Chemical Safety
~~Annual Report for 1983~~
Copy of Spill Report for February 28, 1984.

cc: C. P. Brush
C. Vita
T. A. Marr



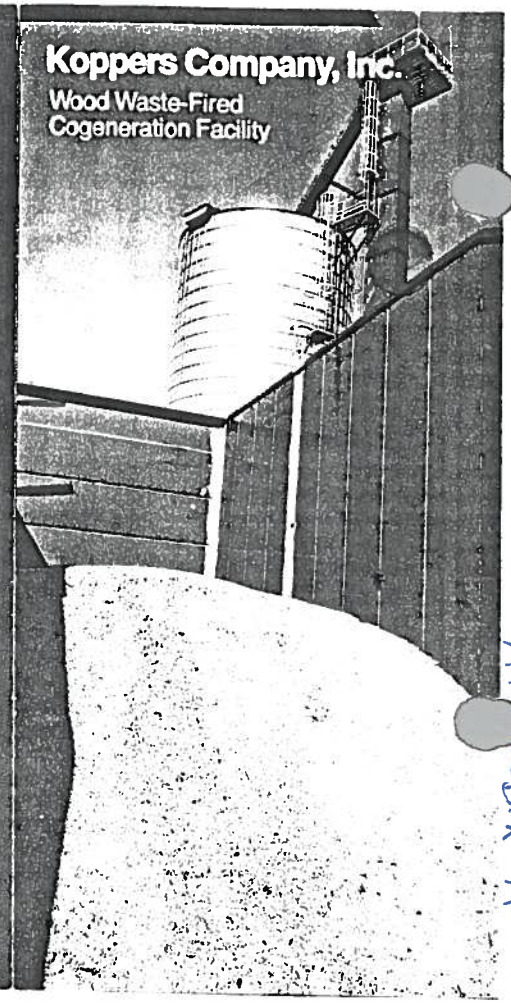
ng unloaded into hopper by truck



age silo and bucket elevator

Koppers Company, Inc.

Wood Waste-Fired Cogeneration Facility



BIOMASS
ENERGY FROM RESIDUE

California Energy Commission
Development Division
Biomass/Cogeneration Office
1516 Ninth Street
Sacramento, California 95814
(916) 324-3463

APPENDIX-A

Koppers Company, Inc.

Solving waste disposal problems while decreasing energy costs, these were the benefits that persuaded Koppers Company Inc. Wood Products Division, to install a biomass cogeneration system at its Oroville, California, plant. As further incentive, a no-interest equipment loan from the California Energy Commission (CEC) helped reduce the financial risk of implementing this new technology.

Wood Waste to Electricity

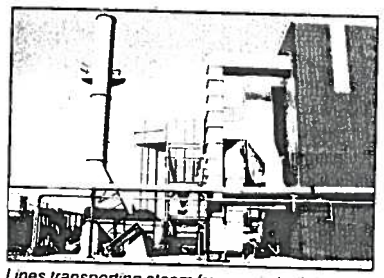
In processing pressure-treated utility poles, fire resistant shakes and shingles, and Wolmanized outdoor building lumber, Koppers employs an on-site debarker which creates a significant volume of peeler waste every year. In the past, this waste was disposed of in a teepee burner. Koppers wanted to find an alternative to burning, as well as to cut down on the rising cost of natural gas used to produce process heat for its wood-treating plants and dry kilns.

Support from the Energy Commission

To decrease the risk of such a project, Koppers applied to the CEC for a no-interest loan that would finance the purchase of innovative equipment. Under the State Agricultural and Forestry Residue Utilization Act of 1979 (SAFRUA), the CEC provides financial and technical assistance to demonstrate the feasibility of biomass conversion systems. The CEC was impressed with the Koppers proposal, and a loan was made.

The Koppers System

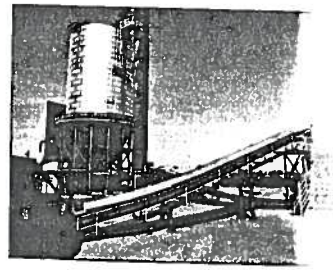
Collection: The Koppers cogeneration system requires 110,000 green tons per year of biomass residue. Koppers' own wood waste comprises 15 percent of this amount; the company will purchase orchard prunings and forest slash to complete the fuel requirements.



Lines transporting steam from main building to kilns and processing plant

In addition, Koppers will contract with logging companies to deliver full length trees, collectible cull poles and forest slash to Koppers' plant — waste that normally is left in the forest and open burned.

Cogeneration: This cogeneration system consists of a four-cell pile burning system from Wellons of Sherwood, Oregon — a furnace noted for its high efficiency, low emission rates and ability to burn woody fuels with moisture contents of up to 50 percent. The system includes a Nebraska boiler, capable of generating 60,000 lb/hr of 400 psig/650°F superheated steam which is expanded through an extraction turbine to drive a generator rated at 6 MW. Up to 30,000 lb/hr of saturated steam will be extracted from the turbine for process heat. The cogeneration system will produce 28 million Kwh of electricity per

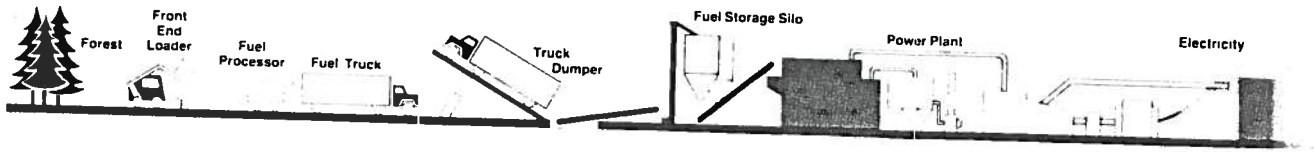


Fuel handling: Designed by Koppers engineers, this innovative system can efficiently handle and process a variety of biomass fuels. It will soon become a common feature on most biomass facilities.

System Benefits

Koppers' system will produce enough energy to meet all its current electricity and heat needs. The surplus will be sold to Pacific Gas and Electric Company. At a cost of $5 million, the entire cogeneration system will pay for itself in five years.

By retiring the teepee burner, air pollution in the area will be reduced. And the community will gain economic benefits as a new market for biomass fuel is opened, and jobs in the collection and processing industry are created.



KOPPERS

Interoffice Correspondence

To C. P. Brush

Location Pittsburgh - K-1201

Subject RCRA Statistical Analyses for Grenada, MS Plant

From R. L. Weightman

Location Monroeville

Date June 6, 1984

The following memo presents the statistical analyses for 1982-1983 (combined) for the RCRA Monitoring Wells at Grenada, Mississippi. This data is presented in response to a memo from you dated May 4, 1984. Included in this memo is a summary of the indicator parameters (pH, conductivity, TOC, TOH) and other groundwater quality parameters for RCRA Wells R-1, R-2, R-3, and R-4. This data is shown in Tables 1a-1f for 1982 and 1983. Also included are the Student-t Test for each indicator parameter.

Student-T Test

RCRA requires that a Student-t Test be computed for each indicator parameter. Table 1 shows the results of these Student-t Tests. As indicated previously, the data used to run the Student-t Tests was obtained from combining 1982 and 1983 data. This was done because of the lack of data in 1983. The RCRA wells were only sampled twice in 1983, with no replicate analyses done. This small sample population for 1983 was considered too small for comparison. If this method is not acceptable, an alternative method may be proposed. The Student-t Test that was used is the Cochran's Approximation to the Behrens-Fisher Student-t Test (CABF). Using this CABF method, the Student-t Tests were run to compare the upgradient well (R-1) to each downgradient well (R-2, R-3, R-4). In all cases a 0.05 level of significance was used. A two-sided test was used for pH because both positive and negative changes in pH are important to detect. One-sided tests were used for the remaining parameters (conductivity, TOC, and TOH).

The CABF Student-t Test requires data that is normally distributed. Therefore, it is necessary to calculate the coefficient of variation (CV) for each indicator parameter of the background data. The CV's for 1982-1983 background data are shown at the bottom of Table 1. Data having CV's less than one are recognized by the EPA as having distributions which are likely normal. For each of the comparisons the CV of the background data was computed and was found to be less than one.

From Table 1 there was a significant change in pH and conductivity for R-1 vs. R-2. In all other cases there were no significant changes detected. Also, it should be noted that Tables 1a-1f are a **complete** list of the analyses conducted on the RCRA well water samples.

At the present time a computer program is being developed for RCRA data storage, data manipulation, and Student-t analysis. This program will include storage for well data, analytical results, and Student-t analysis. We will be able to run Student-t Tests in a variety of ways. When the program is on-line I will circulate a memo stating its capabilities.

R. L. Weightman

R. L. Weightman

/mad
attachments
cc: A. C. Middleton
J. R. Smith
J. A. Quagliotti
C. J. Vita

TABLE 1a
KOPPERS COMPANY, INC.
TREATED WOOD PRODUCTS DIVISION
GRENADA, MISSISSIPPI PLANT

RCRA MONITORING WELL RESULTS FOR 1ST SAMPLING 1982

	Sampling Date	Upgradient	Downgradient		
		R-1	R-2	R-3	R-4
INDICATOR PARAMETERS FOR GROUNDWATER CONTAMINATION					
pH, units	3/30/82	6.18/6.18/6.18/6.19*	5.8	6.07	5.92
Specific Conductance, umhos/cm	3/30/82	462/462/462/462*	465	342	222
Total Organic Carbon, TOC	3/30/82	9.4/9.5/9.5/9.6*	10	11.5	10
GROUNDWATER QUALITY PARAMETERS					
Phenols	3/30/82	<0.005	<0.005	<0.005	<0.005
OTHER PARAMETERS (Groundwater Primary Drinking Water Parameters)					
Arsenic	3/30/82	<0.05	<0.05	<0.05	<0.05
Chromium (Total)	3/30/82	0.06	<0.05	<0.05	0.07
Chromium (Hexavalent)	3/30/82	< 0.05	<0.05	<0.05	<0.05
Chemical Oxygen Demand (COD)	3/30/82	26	1.2	12	1
Pentachlorophenol (PCP)	3/30/82	0.0013	0.0022	<0.005	<0.005
Copper	3/30/82	0.05	<0.05	0.06	0.07

NOTE: All values in mg/L unless otherwise noted.

* Replicate analyses.

TABLE 1b
KOPPERS COMPANY, INC.
TREATED WOOD PRODUCTS DIVISION
GRENADA, MISSISSIPPI PLANT

RCRA MONITORING WELL RESULTS FOR 2ND SAMPLING 1982

	Sampling Date	Upgradient	Downgradient		
		R-1	R-2	R-3	R-4
INDICATOR PARAMETERS FOR GROUNDWATER CONTAMINATION					
pH, units	6/24/82	7.6/7.6/7.6/7.6*	6.0	6.8	6.8
Specific Conductance, umhos/cm	6/24/82	135/135/135/135*	265	230	150
Total Organic Carbon, TOC	6/24/82	10/10/7.9/6.2*	2.6	5.1	6.2
GROUNDWATER QUALITY PARAMETERS					
Phenols	6/24/82	<0.005	<0.005	<0.005	0.03
OTHER PARAMETERS (Groundwater Primary Drinking Water Parameters)					
Arsenic	6/24/82	<0.05	<0.05	<0.05	<0.05
Chromium (Total)	6/24/82	0.097	0.094	0.113	0.17
Chromium (Hexavalent)	6/24/82	<0.05	<0.05	<0.05	<0.05
Chemical Oxygen Demand (COD)	6/24/82	65	12	29	29
Pentachlorophenol (PCP)	6/24/82	0.0023	0.0014	0.00085	0.0011
Copper	6/24/82	<0.05	<0.05	<0.05	0.06

NOTE: All values in mg/L unless otherwise noted.

* Replicate analyses.

TABLE 1d
KOPPERS COMPANY, INC.
TREATED WOOD PRODUCTS DIVISION
GRENADA, MISSISSIPPI PLANT

RCRA MONITORING WELL RESULTS FOR 4TH SAMPLING 1982

	Sampling Date	Upgradient	Downgradient		
		R-1	R-2	R-3	R-4
INDICATOR PARAMETERS FOR GROUNDWATER CONTAMINATION					
pH, units	12/8/82	6.2/6.2/6.2/6.2*	5.7	6.1	6.1
Specific Conductance, umhos/cm	12/8/82	180/180/180/180*	400	255	165
Total Organic Carbon, TOC	12/8/82	7.9/6.5/6.0/7.0*	3.5	4.2	2.5
GROUNDWATER QUALITY PARAMETERS					
Phenols	12/8/82	0.012	<0.005	0.017	<0.005
OTHER PARAMETERS (Groundwater Primary Drinking Water Parameters)					
Arsenic	12/8/82	<0.05	<0.05	<0.05	<0.05
Chromium (Total)	12/8/82	<0.05	<0.05	<0.05	<0.05
Chromium (Hexavalent)	12/8/82	<0.05	<0.05	<0.05	<0.05
Chemical Oxygen Demand (COD)	12/8/82	12	<1	<1	16
Pentachlorophenol (PCP)	12/8/82	<0.001	<0.001	<0.001	<0.001
Copper	12/8/82	<0.05	<0.05	<0.05	<0.05

NOTE: All values in mg/L unless otherwise noted.

* Replicate analyses.

TABLE 1c
KOPPERS COMPANY, INC.
TREATED WOOD PRODUCTS DIVISION
GRENADA, MISSISSIPPI PLANT

RCRA MONITORING WELL RESULTS FOR 3RD SAMPLING 1982

	Sampling Date	Upgradient	Downgradient		
		R-1	R-2	R-3	R-4
INDICATOR PARAMETERS FOR GROUNDWATER CONTAMINATION					
pH, units	9/14/82	7.05/7.04/7.06/7.06*	5.97	6.85	6.65
Specific Conductance, umhos/cm	9/14/82	190/190/190/190*	380	330	210
Total Organic Carbon, TOC	9/14/82	8.1/8.8/9.0/9.4*	3.1	6.2	4.1
GROUNDWATER QUALITY PARAMETERS					
Phenols	9/14/82	< 0.005	< 0.005	< 0.005	< 0.005
OTHER PARAMETERS (Groundwater Primary Drinking Water Parameters)					
Arsenic	9/14/82	< 0.05	< 0.05	< 0.05	< 0.05
Chromium (Total)	9/14/82	< 0.05	< 0.05	< 0.05	< 0.05
Chromium (Hexavalent)	9/14/82	< 0.05	< 0.05	< 0.05	< 0.05
Chemical Oxygen Demand (COD)	9/14/82	45	3	37	9
Pentachlorophenol (PCP)	9/14/82	0.0019	<0.0005	<0.0005	<0.0005
Copper	9/14/82	< 0.05	< 0.05	< 0.05	< 0.05

NOTE: All values in mg/L unless otherwise noted.

* Replicate analyses.

TABLE 1e
KOPPERS COMPANY, INC.
TREATED WOOD PRODUCTS DIVISION
GRENADA, MISSISSIPPI PLANT

RCRA MONITORING WELL RESULTS FOR 1ST SAMPLING 1983

	Sampling Date	Upgradient	Downgradient		
		R-1	R-2	R-3	R-4
INDICATOR PARAMETERS FOR GROUNDWATER CONTAMINATION					
pH, units	6/27/83	6.8	6.5	6.5	6.5
Specific Conductance, umhos/cm	6/27/83	290	346	299	220
Total Organic Carbon, TOC	6/27/83	14	6.2	3.6	7.6
Total Organic Halogens, TOH	6/27/83	0.03	0.041	0.028	0.041
GROUNDWATER QUALITY PARAMETERS					
Chloride	6/27/83	11	38	32	39
Iron	6/27/83	1.5	0.6	0.8	0.6
Manganese	6/27/83	0.21	0.09	0.19	0.11
Phenols	6/27/83	0.012	0.006	<0.005	<0.005
Sodium	6/27/83	32	36	36	20
Sulfate	6/27/83	55	97	79	26
OTHER PARAMETERS (Groundwater Primary Drinking Water Parameters)					
Pentachlorophenol (PCP)	6/27/83	0.0084	0.0024	0.0012	0.0043

NOTE: All values in mg/L unless otherwise noted.

TABLE 1f
KOPPERS COMPANY, INC.
TREATED WOOD PRODUCTS DIVISION
GRENADA, MISSISSIPPI PLANT

RCRA MONITORING WELL RESULTS FOR 2ND SAMPLING 1983

	Sampling Date	Upgradient	Downgradient		
		R-1	R-2	R-3	R-4
INDICATOR PARAMETERS FOR GROUNDWATER CONTAMINATION					
pH, units	10/17/83	5.1	4.7	4.8	4.7
Specific Conductance, umhos/cm	10/17/83	270	540	460	230
Toral Organic Carbon, TOC	10/17/83	8	4	4	3
Total Organic Halogens, TOH	10/17/83	0.1	0.23	0.21	0.15
GROUNDWATER QUALITY PARAMETERS					
Chloride	10/17/83	9	57	43	29
Iron	10/17/83	0.76	<0.3	1.03	1.43
Manganese	10/17/83	0.14	0.05	0.68	0.08
Phenols	10/17/83	0.008	<0.005	0.006	0.012
Sodium	10/17/83	24	66	57	20
Sulfate	10/17/83	67	99	50	33
OTHER PARAMETERS (Groundwater Primary Drinking Water Parameters)					
Pentachlorophenol (PCP)	10/17/83	0.0012	<0.001	<0.001	<0.001

NOTE: All values in mg/L unless otherwise noted.

TABLE 1
KOPPERS COMPANY, INC.
TREATED WOOD PRODUCTS DIVISION
GRENADA, MISSISSIPPI PLANT

RCRA STUDENT-t ANALYSIS FOR 1982-1983 DATA

UPGRADIENT WELL R-1 vs. DOWNGRADIENT WELL R-2

Indicator Parameter	Background Mean	Background Variance	Monitor Mean	Monitor Variance	Weighted t	Comparison t	Significant Change
pH	6.6689	0.4918	5.0	0.4293	-5.3075	2.4436	Yes
Conductivity	246	15787.53	399.33	9072.67	3.1369	1.9140	Yes
TOC	8.7111	3.414	4.9	7.80	-3.1225	1.980	No
TOH	0.065	0.0025	0.1355	0.0179	0.6980	6.314	No

UPGRADIENT WELL R-1 vs. DOWNGRADIENT WELL R-3

Indicator Parameter	Background Mean	Background Variance	Monitor Mean	Monitor Variance	Weighted t	Comparison t	Significant Change
pH	6.6689	0.4918	6.1867	0.5717	-1.3771	2.4683	No
Conductivity	246	15787.53	319.33	6589.47	1.6499	1.8929	No
TOC	8.7111	3.414	5.7667	8.7546	-1.7858	1.9834	No
TOH	0.065	0.0025	0.119	0.0166	0.5526	6.314	No

UPGRADIENT WELL R-1 vs. DOWNGRADIENT WELL R-4

Indicator Parameter	Background Mean	Background Variance	Monitor Mean	Monitor Variance	Weighted t	Comparison t	Significant Change
pH	6.6689	0.4918	6.1117	0.5888	1.5731	2.4706	No
Conductivity	246	15787.53	199.5	1121.5	-1.3147	1.7883	No
TOC	8.7111	3.414	5.5667	8.4667	-2.4853	1.9824	No
TOH	0.065	0.0025	0.0955	0.0059	0.4706	6.314	No

COEFFICIENT OF VARIATION FOR BACKGROUND DATA

Parameter	Coefficient of Variation
pH	0.1052
Conductivity	0.5108
TOC	0.2121
TOH	0.7692

NOTE: Statistical analysis for indicator parameter data given in Tables 1a, 1b, 1c, 1d, 1e, 1f for 1982-1983 inclusive.

STATE COPY

Odor as an Aid to Chemical Safety: Odor Thresholds Compared with Threshold Limit Values and Volatilities for 214 Industrial Chemicals in Air and Water Dilution

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Key words: odor threshold; threshold limit value; volatility; solubility; distribution ratio; chemical safety.

The body of information in this paper is directed to specialists in industrial health and safety, and air and water pollution, who need quantitative data on the odor thresholds of potentially hazardous chemical vapors and gases. The literature, largely unorganized, has been reviewed for 214 compounds and condensed into tables based on consistent units. Data on the volatility, solubility, ionization and water–air distribution ratio at 25 °C are included. From the currently recommended threshold limit value (TLV), a safe dilution factor and an odor safety factor are calculated for each compound. The equivalent data are presented for both air and water dilutions of the chemicals. Available data are summarized on the variability of odor sensitivities in the population, and the increased odor concentrations that are required to elicit responses from persons whose attention is distracted, or who are sleeping. This information is reduced to calibration charts that may be used to estimate the relative detectability, warning potential and rousing capacity of the odorous vapors. Each compound has been assigned a letter classification, from A to E, to indicate the margin of safety, if any, that may be afforded by the odor of the compound as a warning that its threshold limit value is being exceeded.

INTRODUCTION

The human sense of smell, although not as acute as that of some other mammals and certain insects, can be a valuable source of information about chemicals in the environment. The nose is exceedingly sensitive to certain repulsive-smelling compounds, produced in trace amounts by pathogenic or putrifying bacteria and molds, such as methyl mercaptan, trimethylamine, 1-pyrroline and isovaleric acid. Although these chemicals themselves are generally harmless to man in the concentrations occurring naturally in air, water or food, heightened odor sensitivities to them may have developed from the protection offered against dangerous or fatal infection or food poisoning.

With the advent of the industrial revolution, persons have been exposed to diverse chemicals, many of which are commonly found in workplace settings at concentrations much higher than occur naturally. Some of these pose an inherent risk to health at certain concentrations. In recognition of this potential hazard, the American Conference of Governmental Industrial Hygienists (ACGIH) publishes an annual listing of Threshold Limit Values (TLV).[1] (TLV® is a registered trademark of ACGIH, whom we thank for permission to use the TLV designation in this paper.) The TLV used in this paper is the time-weighted average value. Based on the best available industrial health data, it is defined as the time-weighted average concentration for a normal 8-h work-day and a 40-h work-week, to which nearly all workers may be repeatedly exposed, day after day, without adverse effect.

The actual concentrations of specific chemicals in the working environment can be sampled and analyzed by various chemical and instrumental means, to determine whether the TLV is being exceeded. The necessary equipment, however, is often expensive, cumbersome and slow, and requires professional skills to operate and interpret. Nevertheless, there is a little-considered alternative, the human nose, that could serve as a first-line warning system for hazardous concentrations of many chemical vapors. The nose is perfectly placed to sample the inspired air, monitors rapidly and continuously, and may even exceed the sensitivity of the best instruments. It is, however, at best only semi-quantitative, and it requires calibration to determine its sensitivity to those chemicals that are of importance in industrial practice. In this regard, it is necessary to evaluate the increased concentration of a compound that may be required to alert the average person to the presence of an odor, while engaged in another activity which requires attention. The typical variability of the population for odor sensitivity and responsiveness should also be taken into consideration.

METHODS

Literature search for basic data

A search was conducted for the olfactory and physiochemical characteristics of all volatile compounds and gases listed

† Author to whom correspondence should be addressed.

CCC-0260-437X/83/0003-0227$09.50

in the *Threshold Limit Values*[1] for 1982. The first objective was to find literature values for the odor-detection thresholds, measured by dilution in either air or water. Dilution of odorants in air can be achieved either dynamically, by adding a calibrated flow of odorant vapor to an air-stream, or statically, by dispersing a known amount of odorant in a vessel or chamber. In the water-dilution procedure, the odorant is prepared as a series of aqueous dilutions in closed, partially filled vessels from which the head-space vapors can be sniffed. Previous reviews include those of Laffort,[2] Patte *et al.*,[3] van Gemert and Nettenbreijer,[4] van Gemert,[5] Fazzalari[6] and the ACGIH *Documentation of Threshold Limit Values*.[7]

In practically every case, we consulted the original articles, so as to minimize errors of transcription, calculation or duplication. Nearly all of the odor thresholds and references are available in the recent comprehensive compilations by van Gemert.[4,5] If an author gave only a recognition threshold, this was accepted, because recognition of an odor requires on average only about three times the detection threshold concentration.[8]

If, for any compound, an odor threshold could be located, then a further search was conducted for relevant physical data. The molecular weights, liquid densities and ionization constants (of acids and bases) for these common compounds can be found in laboratory handbooks. The vapor pressures at 25 °C were usually interpolated by linear regression computations from the tables of Stull.[9] Solubilities in water at 25 °C were often interpolated graphically from data collected by Seidell and co-workers.[10,11] More current information is given in Verschueren's handbook.[12] Certain missing data on vapor pressures, solubilities, ionization constants, and also occasionally data on the air–water partition coefficient, were found in Beilstein's *Handbuch*[13] and its four supplements. A few solubilities were estimated by extrapolation of homologous series or by comparison with isomers.

The air–water partition coefficient describes the relative distribution of a chemical in this two-phase system. Quantitatively, it is the ratio of the concentrations of the chemical in air and water (both expressed as g l^{-1}) at equilibrium. For compounds of finite water solubility, the coefficient

Table 1. Literature odor thresholds for *n*-butyl alcohol[a]

Water-dilution threshold		Air-dilution threshold		
Original data	g l^{-1}	Original data	g l^{-1}	First reference
		1 μg/l	1.00×10^{-6}	Passy, 1892
		0.565×10^{-8} mol l^{-1}	4.18×10^{-7}	Backman, 1917
		0.000223 mg/l	2.23×10^{-7}	Jung, 1936
		$Act_{25} = 6 \times 10^{-6}$	1.61×10^{-7}	Gavaudan, 1948
		$Act_{37} = 7.0 \times 10^{-4}$	4.09×10^{-5}	Mullins, 1955
0.005% (v/v)	4.03×10^{-2}		1.45×10^{-5}	Moncrieff, 1957
1 mg/l	1.00×10^{-3}	15 ppm (v/v)	4.56×10^{-5}	Scherberger, 1958
1.00 ppm (w/v)	1.00×10^{-3}		3.60×10^{-7}	Nazarenko, 1962
2.5 ppm (v/v)	2.01×10^{-3}		3.60×10^{-7}	Rosen, 1962
			7.24×10^{-7}	Baker, 1963
		$Act_{25} = 5 \times 10^{-5}$	1.40×10^{-6}	Gavaudan, 1966
0.50 ppm (v/v)	4.02×10^{-4}	33 mg/m³	3.30×10^{-5}	May, 1966
			1.45×10^{-7}	Flath, 1967
		1.10×10^{13} mol/cc	1.34×10^{-6}	Dravnieks, 1968
		1.2 mg/m³	1.20×10^{-6}	Khachaturyan, 1969
		0.013 mg/l	1.30×10^{-5}	Corbitt, 1971
		$-\log_{10}$ M/l = 7.91	9.12×10^{-7}	Laffort, 1973
		0.30 ppm (v/v)	9.11×10^{-7}	Hellman, 1974
		3.16 ppm (v/v)	9.60×10^{-6}	Moskowitz, 1974
		62 ppm (v/v)	1.88×10^{-4}	Moskowitz, 1974
2.0 mg/kg	2.00×10^{-3}		7.20×10^{-7}	de Grunt, 1975
3.6×10^{-4} M/l	2.67×10^{-2}		9.61×10^{-6}	Hertz, 1975
2.77 ppm (w/v)	2.77×10^{-3}		9.97×10^{-7}	Lillard, 1975
		0.0231 mmHg	9.23×10^{-5}	Piggott, 1975
		0.390 ppm (v/v)	1.18×10^{-6}	Dravnieks, 1976
		2.8×10^{-1} ppm (v/v)	8.50×10^{-7}	Williams, 1977
6.5×10^{-3} g/l	6.50×10^{-3}		2.34×10^{-6}	Amoore, 1978
		3.5 ppm (v/v)	1.06×10^{-5}	Laing, 1978
		$\log_2$ ppb = 10.42	4.15×10^{-6}	Punter, 1980

Geometric mean, air-dilution threshold = 2.54×10^{-6} g l^{-1} ($N = 29$)
= 2.54 mg m^{-3}
= 0.835 ppm (v/v)
Standard deviation = $x/\div 7.14$; Standard error = $x/\div 1.44$

[a] MW = 74.1 g; D_{25} 0.806 g ml^{-1}; VP_{25} = 6.99 mmHg; S_{25} = 73.0 g l^{-1}; air-water partition coefficient at 25 °C = 3.6×10^{-4} (expt.), 3.61×10^{-4} (calc.).

Table 2(a) Air-dilution odor threshold data on 214 industrial chemicals. The numerical data are mostly rounded off to two significant figures. Note that ppm on this half of Table 2 are in v/v units ($\mu l\ l^{-1}$) for the gaseous chemical in air dilution. See Methods for further explanation of each column. TLVs are reproduced from Ref. 1 (1982) with permission from ACGIH

Substance	1 Threshold limit value (ppm; v/v)	2 Volatility at 25°C (ppm; v/v)	3 Air odor threshold (ppm; v/v)	4 Standard error (×/÷)	5 Safe dilution factor	6 Odor safety factor	7 Odor safety class
Acetaldehyde	100	g	0.050	1.7	10 000	2000	A
Acetic acid	10	20 000	0.48	1.5	2000	21	C
Acetic anhydride	5	6700	0.13	1.1	1300	39	B
Acetone	750	290 000	13	1.6	390	57	B
Acetonitrile	40	120 000	170	2.8	3000	0.23	D
Acetylene	140 000[1]	g	620	2.8	7	230	B
Acrolein	0.1	360 000	0.16	1.5	3 600 000	0.61	D
Acrylic acid	10	5800	0.094	–	580	110	B
Acrylonitrile	2	140 000	17	2.4	72 000	0.12	E
Allyl alcohol	2	33 000	1.1	1.3	16 000	1.8	C
Allyl chloride	1	480 000	1.2	2.5	480 000	0.84	D
Ammonia	25	g	5.2	2.0	40 000	4.8	C
n-Amyl acetate	100	5200	0.054	2.1	52	1800	A
sec-Amyl acetate	125	9200	0.0020	–	74	61 000	A
Aniline	2	630	1.1	1.6	310	1.9	C
Arsine	0.05	g	0.50	–	20 000 000	0.10	E
Benzene	10	120 000	12	1.6	12 000	0.85	D
Benzyl chloride	1	1600	0.044	1.1	1600	23	C
Biphenyl	0.2	11	0.00083	–	56	240	B
Bromine	0.1	270 000	0.051	2.2	2 700 000	2.0	C
Bromoform	0.5	8000	1.3	2.3	16 000	0.39	D
1,3-Butadiene	1000	g	1.6	2.5	1000	640	A
Butane	800	g	2700	1.4	1300	0.29	D
2-Butoxyethanol	25	1300	0.10	–	52	250	B
n-Butyl acetate	150	16 000	0.39	2.5	110	390	B
n-Butyl acrylate	10	7100	0.035	5.3	720	290	B
n-Butyl alcohol	50	9200	0.83	1.4	180	60	B
sec-Butyl alcohol	100	23 000	2.6	2.0	230	38	B
tert-Butyl alcohol	100	55 000	47	2.6	550	2.1	C
n-Butylamine	5	93 000	1.8	2.5	19 000	2.7	C
n-Butyl lactate	5	590	7.0	–	120	0.71	D
n-butyl mercaptan	0.5	~49 000	0.00097	1.4	97 000	510	B
p-tert-Butyltoluene	10	850	5.0	–	85	2.0	C
Camphor	2	450	0.27	1.9	230	7.3	C
Carbon dioxide	5000	g	74 000	1.5	200	0.067	E
Carbon disulfide	10	470 000	0.11	1.9	47 000	92	B
Carbon monoxide	50	g	100 000	10	20 000	0.00050	E
Carbon tetrachloride	5	140 000	96	1.8	29 000	0.052	E
Chlorine	1	g	0.31	1.8	1 000 000	3.2	C
Chlorine dioxide	0.1	g	9.4	1.6	10 000 000	0.011	E
α-Chloroacetophenone	0.05	9.9	0.035	1.1	200	1.4	C
Chlorobenzene	75	15 000	0.68	1.6	200	110	B
Chlorobromomethane	200	190 000	400	–	940	0.50	D
Chloroform	10	250 000	85	1.7	25 000	0.12	E
Chloropicrin	0.1	34 000	0.78	1.4	340 000	0.13	E
β-Chloroprene	10	290 000	15	7.9	29 000	0.68	D
o-Chlorotoluene	50	4700	0.32	1.5	94	150	B
m-Cresol	5	180	0.00028	2.4	36	17 000	A
trans-Crotonaldehyde	2	~41 000	0.12	1.1	20 000	17	C
Cumene	50	5900	0.088	2.9	120	570	A

Table 2(b) Water-dilution odor threshold data on the same 214 chemicals. Note that ppm on this half of Table 2 are in w/v units (mg l^{-1}) for the chemical in aqueous solution. The numerical values in Table 2 are almost invariably compiled, averaged, re-calculated or extrapolated from the literature, and are *not* new experimental determinations

	8	9	10	11	12	13	14	
							Number of thresholds performed	
Substance	Water TLV equivalent (ppm; w/v)	Solubility at 25°C (ppm; w/v)	Water odor threshold (ppm; w/v)	Molecular weight (g)	Density at 20–25°C (g ml^{-1})	Water–air distribution ratio (w/v)	air	water
Acetaldehyde	67	∞	0.034	44	0.79_{16}	370	6	3
Acetic acid (A/4.7)	2000	∞	97	60	1.05	82 000	14	4
Acetic anhydride	d	d	d	102	1.08	d	2	–
Acetone	1100	∞	20	58	0.79	620	20	8
Acetonitrile	70	∞	300	41	0.78	1000	3	–
Acetylene	(150)	1000	(0.67)	26	g	1.0	2	–
Acrolein	0.066	200 000	0.11	56	0.84	290	7	1
Acrylic acid (A/4.3)		∞		72	1.05	---	1	–
Acrylonitrile	1.1	73 000	9.1	53	0.80	240	2	2
Allyl alcohol	26	∞	14	58	0.85	5600	4	–
Allyl chloride	(0.0075)	3600_{20}	(0.0089)	76	0.94	2.4	2	–
Ammonia (B/9.2)	7.1	280 000	1.5	17	g	400	11	2
n-Amyl acetate	68	1800_{20}	0.037	130	0.88	130	5	4
sec-Amyl acetate	110	1700	0.0017	130	0.87	160	–	1
Aniline (B/4.6)	120	37 000	65	93	1.02	16 000	9	1
Arsine	(0.000035)	670	(0.00035)	78	g	0.22	1	–
Benzene	(0.15)	1800	(0.17)	78	0.88	4.6	19	4
Benzyl chloride	0.28	460_{30}	0.012	127	1.10	55	2	–
Biphenyl	0.12	6.7	0.00050	154	s	95	–	1
Bromine	0.012	33 000	0.0063	160	3.12	19	4	–
Bromoform	0.20	3100	0.51	253	2.89	38	4	1
1,3-Butadiene	(0.88)	850	(0.0014)	54	g	0.40	6	–
Butane	(0.051)	61	(0.17)	58	g	0.027	4	–
2-Butoxyethanol		∞		118	0.90		1	–
n-Butyl acetate	65	6800	0.17	116	0.88	91	9	3
n-Butyl acrylate	2.2	1600_{20}	0.0078	128	0.90	43	2	1
n-Butyl alcohol	420	73 000	7.1	74	0.81	2800	20	9
sec-Butyl alcohol	730	200 000	19	74	0.81	2400	5	1
tert-Butyl alcohol	620	∞	290	74	0.78	2000	4	1
n-Butylamine (B/10.6)	17	∞	6.2	73	0.73	1100	3	2
n-Butyl lactate	370	42 000	520	146	0.98	12 000	1	–
n-Butyl mercaptan (A/10.8)	(0.0061)	600_{20}	(0.000012)	90	0.84	3.3	6	–
p-tert-Butyltoluene	(0.064)	~5.5	(0.032)	148	0.86	1.1	1	–
Camphor	7.5	1700_{20}	1.0	152	s	600	9	3
Carbon dioxide (A/6.4)	(7.5)	1400	(110)	44	g	0.83	2	–
Carbon disulfide	(0.036)	1700	(0.00039)	76	1.26	1.2	6	–
Carbon monoxide	(0.0013)	26	(2.7)	28	g	0.023	2	–
Carbon tetrachloride	(0.027)	770	(0.52)	154	1.59	0.85	10	1
Chlorine	(0.0065)	6300	(0.0020)	71	g	2.2	7	–
Chlorine dioxide (A)	0.0071	$87\,000_{15}$	0.67	67	g	26	1	1
α-Chloroacetophenone	d	d	d	155	s	d	2	–
Chlorobenzene	5.5	1100	0.050	113	1.10	16	6	2
Chlorobromomethane	17	~16 000	34	129	1.93	16	1	–
Chloroform	(0.28)	7100	(2.4)	119	1.48	5.7	14	1
Chloropicrin	(0.0048)	1600	(0.037)	164	1.65	7.1	1	1
β-Chloroprene	(0.016)	480_{20}	(0.024)	88	0.96	0.45	2	1
o-Chlorotoluene	(1.1)	100_{30}	(0.0069)	127	1.08	4.1	1	1
m-Cresol (A/10.1)	640	23 000	0.037	108	1.03	29 000	3	3
trans-Crotonaldehyde	7.2	$150\,000_{20}$	0.42	70	0.85	1200	1	1
Cumene	(0.45)	53	(0.00080)	120	0.86	1.8	6	1

Table 2(a)–*Continued*

Substance	1 Threshold limit value (ppm; v/v)	2 Volatility at 25°C (ppm; v/v)	3 Air odor threshold (ppm; v/v)	4 Standard error ($x/\div$)	5 Safe dilution factor	6 Odor safety factor	7 Odor safety class
Cyclohexane	300	130 000	25	2.8	430	12	C
Cyclohexanol	50	2000	0.15	2.1	39	340	8
Cyclohexanone	25	6000	0.88	2.2	240	28	B
Cyclohexene	300	99 000	0.18	–	330	1600	A
Cyclohexylamine	10	15 000	2.6	–	1500	3.8	C
Cyclopentadiene	75	~560 000	1.9	–	7500	40	B
Decaborane	0.05	~110	0.060	–	2300	0.83	D
Diacetone alcohol	50	1600	0.28	–	33	180	B
Diborane	0.1	g	2.5	–	10 000 000	0.040	E
o-Dichlorobenzene	50	1800	0.30	4.2	37	160	B
p-Dichlorobenzene	75	1200	0.18	4.1	17	420	B
trans-1,2-Dichloroethylene	200	420 000	17	16	2100	12	C
β,β'-Dichloroethyl ether	5	1500	0.049	–	290	100	B
Dicyclopentadiene	5	3600	0.0057	1.9	720	870	A
Diethanolamine	3	78	0.27	–	26	11	C
Diethylamine	10	310 000	0.13	2.9	31 000	77	B
Diethylaminoethanol	10	2900	0.011	–	290	910	A
Diethyl ketone	200	22 000	2.0	2.1	110	97	B
Diisobutyl ketone	25	3300	0.11	–	130	230	B
Diisopropylamine	5	110 000	1.8	3.9	21 000	2.7	C
N-Dimethylacetamide	10	2600	47	–	260	0.21	D
Dimethylamine	10	g	0.34	3.1	100 000	29	B
N-Dimethylaniline	5	1000	0.013	3.8	200	400	B
N-Dimethylformamide	10	3100	2.2	46	310	4.6	C
1,1-Dimethylhydrazine	0.5	210 000	1.7	5.5	410 000	0.30	D
1,4-Dioxane	25	52 000	24	2.4	1000	1.1	C
Epichlorhydrin	2	21 000	0.93	12	11 000	2.1	C
Ethane	140 000[i]	g	120 000	5.9	7	1.2	C
Ethanolamine	3	780	2.6	–	260	1.2	C
2-Ethoxyethanol	5[n]	7100	2.7	9.0	1400	1.8	C
2-Ethoxyethyl acetate	5[n]	2700	0.056	–	530	89	B
Ethyl acetate	400	120 000	3.9	1.8	300	100	B
Ethyl acrylate	5	50 000	0.0012	4.1	10 000	4000	A
Ethyl alcohol	1000	75 000	84	1.8	75	12	C
Ethylamine	10	g	0.95	2.6	100 000	11	C
Ethyl *n*-amyl ketone	25	3600	6.0	–	140	4.2	C
Ethyl benzene	100	13 000	2.3	2.7	130	44	B
Ethyl bromide	200	610 000	3.1	–	3100	64	B
Ethyl chloride	1000	g	4.2	–	1000	240	B
Ethylene	140 000[i]	g	290	2.6	7	490	B
Ethylenediamine	10	16 000	1.0	–	1600	10	C
Ethylene dichloride	10	110 000	88	2.1	11 000	0.11	E
Ethylene oxide	1[n]	g	430	1.6	1 000 000	0.0023	E
Ethylenimine	0.5	260 000	1.5	1.3	520 000	0.32	D
Ethyl ether	400	700 000	8.9	3.3	1800	45	B
Ethyl formate	100	320 000	31	1.6	3200	3.3	C
Ethylidene norbornene	5		0.014	1.4		350	B
Ethyl mercaptan	0.5	710 000	0.00076	2.0	1 400 000	650	A
N-Ethylmorpholine	5	11 000	1.4	18	2100	3.5	C
Ethyl silicate	10	3000	17	4.9	300	0.57	D
Fluorine	1	g	0.14	–	1 000 000	7.3	C
Formaldehyde	1[n]	g	0.83	2.3	1 000 000	1.2	C
Formic acid	5	57 000	49	1.9	11 000	0.10	E
Furfural	2	2100	0.078	1.7	1000	25	C
Furfuryl alcohol	10	810	8.0	–	81	1.2	C

Table 2(b) continued

Substance	Water TLV equivalent (ppm; w/v)	Solubility at 25°C (ppm; w/v)	Water odor threshold (ppm; w/v)	Molecular weight (g)	Density at 20-25°C (g ml^{-1})	Water–air distribution ratio (w/v)	Number of thresholds performed: air	Number of thresholds performed: water
Cyclohexane	(0.13)	55	(0.011)	84	0.78	0.12	6	–
Cyclohexanol	940	36 000	2.8	100	0.95	4600	3	2
Cyclohexanone	240	~54 000	8.3	98	0.95	2400	8	2
Cyclohexene	(0.65)	210	(0.00039)	82	0.81	0.64	1	–
Cyclohexylamine (B/10.6)	94	∞	25	99	0.87	2300	–	1
Cyclopentadiene	(0.24)	~1800	(0.0060)	66	0.80	1.2	1	–
Decaborane				122	s		1	–
Diacetone alcohol		∞	64	116	0.94		1	2
Diborane	d	d	d	28	g	d	1	–
O-Dichlorobenzene	3.9	140	0.024	147	1.30	13	3	2
p-Dichlorobenzene	4.7	79	0.011	147	s	10	2	3
trans-1,2-Dichloroethylene	(3.0)	6300	(0.26)	97	1.26	3.8	2	–
β,β'-Dichloroethyl ether	36	11 000	0.36	143	1.21	1200	–	1
Dicyclopentadiene				132	s		2	–
Diethanolamine (B/8.9)	240 000	∞	22 000	105	1.10	19 000 000	1	–
Diethylamine (B/11.0)	36	∞	0.47	73	0.71	1200	6	1
Diethylaminoethanol (B/8.8)		∞		117	0.88		1	–
Diethyl ketone	450	48 000	4.7	86	0.81	640	3	–
Diisobutyl ketone	3.3	430	0.014	142	0.81	23	1	–
Diisopropylamine (B/11.0)	3.5		1.3	101	0.72	~170	2	1
N-Dimethylacetamide		∞		87	0.94		1	–
Dimethylamine (B/10.7)	8.6	550 000	0.29	45	g	460	6	2
N-Dimethylaniline (B/5.2)	9.9	2000	0.025	121	0.96	400	3	–
N-Dimethylformamide		∞	50	73	0.94		2	1
1,1-Dimethylhydrazine (B/7.2)		∞		60	0.79		2	–
1,4-Dioxane	240	∞	230	88	1.03	2700	7	1
Epichlorhydrin	6.4	65 000	3.0	92	1.18	840	2	–
Ethane	(8.8)	60	(7.5)	30	g	0.051	2	–
Ethanolamine (B/9.5)	23 000	∞	20 000	61	1.02	3 100 000	1	–
2-Ethoxyethanol		∞	190	90	0.93		2	1
2-Ethoxyethyl acetate	450	$200\,000_{20}$	5.0	132	0.97	16 000	1	–
Ethyl acetate	270	73 000	2.6	88	0.90	180	8	4
Ethyl acrylate	1.5	15 000	0.00038	100	0.92	74	2	1
Ethyl alcohol	9000	∞	760	46	0.79	4800	13	5
Ethylamine (B/10.7)	45	∞_{16}	4.3	45	0.69_{15}	2400	3	3
Ethyl *n*-amyl ketone	10	~1500	2.5	128	0.83	80	1	–
Ethyl benzene	(1.3)	160	(0.029)	106	0.87	2.9	2	3
Ethyl bromide	(2.9)	9000	(0.046)	109	1.43	3.3	1	–
Ethyl chloride	(4.7)	4700	(0.019)	64	g	1.8	1	–
Ethylene	(19)	130	(0.039)	28	g	0.12	4	1
Ethylenediamine (B/10.0)		∞	16 000	60	0.90		1	1
Ethylene dichloride	0.80	8600	7.0	99	1.26	20	8	2
Ethylene oxide	0.33	$270\,000_{20}$	140	44	g	180	2	–
Ethylenimine (B/8.0)	d	∞d	170d	43	0.83	d	2	1
Ethyl ether	34	56 000	0.75	74	0.71	28	7	–
Ethyl formate	35	100 000	11	74	0.92	120	1	1
Ethylidene norbornene				120			2	–
Ethyl mercaptan (A/10.5)	(0.0049)	7000	(0.0000075)	62	0.83	3.9	12	1
N-Ethylmorpholine (B/)		∞		115	0.90		2	–
Ethyl silicate	d	d	d	208	0.93	d	2	–
Fluorine	d	d	d	38	g	d	1	–
Formaldehyde	0.73	550 000	0.60	30	g	590	9	4
Formic acid (A/3.7)	170	∞	1700	46	1.22	18 000	4	5
Furfural	89	86 000	3.5	96	1.16	11 000	2	3
Furfuryl alcohol	d	∞d	d	98	1.13	d	1	–

Table 2(a)—*Continued*

Substance	1 Threshold limit value (ppm; v/v)	2 Volatility at 25 °C (ppm; v/v)	3 Air odor threshold (ppm; v/v)	4 Standard error (x/÷)	5 Safe dilution factor	6 Odor safety factor	7 Odor safety class
Halothane	50[n]	390 000	33	–	7900	1.5	C
Heptane	400	60 000	150	1.7	150	2.7	C
Hexachlorocyclopentadiene	0.01	78	0.030	5.1	7800	0.34	D
Hexachloroethane	10	770	0.15	–	77	64	B
Hexane	50	200 000	130	2.0	4000	0.37	D
Hexylene glycol	25	100	50	–	4.0	0.50	D
Hydrazine	0.1	18 000	3.7	1.1	180 000	0.027	E
Hydrogen bromide	3	g	2.0	–	330 000	1.5	C
Hydrogen chloride	5	g	0.77	2.2	200 000	6.5	C
Hydrogen cyanide	10	970 000	0.58	1.9	97 000	17	C
Hydrogen fluoride	3	g	0.042	1.2	330 000	71	B
Hydrogen selenide	0.05	g	0.30	–	20 000 000	0.17	E
Hydrogen sulfide	10	g	0.0081	1.5	100 000	1200	A
Indene	10	2200	0.015	3.9	220	690	A
Iodoform	0.6	~49	0.0050	1.8	81	120	B
Isoamyl acetate	100	7100	0.025	1.6	71	3900	A
Isoamyl alcohol	100	4300	0.042	1.3	43	2300	A
Isobutyl acetate	150	26 000	0.64	1.8	170	230	B
Isobutyl alcohol	50	16 000	1.6	2.0	330	30	B
Isophorone	5	450	0.20	–	89	25	C
Isopropyl acetate	250	79 000	2.7	2.9	320	93	B
Isopropyl alcohol	400	57 000	22	1.8	140	18	C
Isopropylamine	5	740 000	1.2	2.8	150 000	4.1	C
Isopropyl ether	250	210 000	0.017	–	850	15 000	A
Maleic anhydride	0.25	~170	0.32	–	670	0.77	D
Mesityl oxide	15	13 000	0.45	26	850	33	B
2-Methoxyethanol	5[n]	16 000	2.3	26	3200	2.1	C
Methyl acetate	200	270 000	4.6	3.5	1400	44	B
Methyl acrylate	10	110 000	0.0048	–	11 000	2100	A
Methyl acrylonitrile	1	88 000	7.0	–	88 000	0.14	E
Methyl alcohol	200	160 000	100	2.0	800	2.0	C
Methylamine	10	g	3.2	4.6	100 000	3.1	C
Methyl *n*-amyl ketone	50	2000	0.35	2.1	40	140	B
N-Methylaniline	0.5	640	1.7	–	1300	0.29	D
Methyl *n*-butyl ketone	5	5000	0.076	–	1000	66	B
Methyl chloroform	350	160 000	120	2.8	470	2.8	C
Methyl 2-cyanoacrylate	2	~530	2.2	–	260	0.91	D
Methylcyclohexane	400	61 000	630	–	150	0.63	D
cis-3-Methylcyclohexanol	50	710	500	–	14	0.10	E
Methylene chloride	100	550 000	250	1.2	5500	0.40	D
Methyl ethyl ketone	200	130 000	5.4	1.9	660	37	B
Methyl formate	100	760 000	600	2.9	7600	0.17	E
Methyl hydrazine	0.2	65 000	1.7	–	330 000	0.12	E
Methyl isoamyl ketone	50	4800	0.012	–	96	4200	A
Methyl isobutyl carbinol	25	7800	0.070	–	310	360	B
Methyl isobutyl ketone	50	9500	0.68	2.3	190	73	B
Methyl isocyanate	0.02	630 000	2.1	–	32 000 000	0.0094	E
Methyl isopropyl ketone	200	39 000	1.9	2.3	200	100	B
Methyl mercaptan	0.5	g	0.0016	2.0	2 000 000	300	B
Methyl methacrylate	100	52 000	0.083	1.9	520	1200	A
Methyl *n*-propyl ketone	200	21 000	11	2.2	110	18	C
α-Methyl styrene	50	3800	0.29	4.0	76	170	B
Morpholine	20	13 000	0.01	–	670	2000	A
Naphthalene	10	120	0.084	1.9	12	120	B
Nickel carbonyl	0.05	520 000	0.30	3.3	10 000 000	0.17	E

Table 2(b)—*Continued*

Substance	8 Water TLV equivalent (ppm; w/v)	9 Solubility at 25 °C (ppm; w/v)	10 Water odor threshold (ppm; w/v)	11 Molecular weight (g)	12 Density at 20–25 °C (g ml^{-1})	13 Water–air distribution ratio (w/v)	14 Number of thresholds performed: air	14 Number of thresholds performed: water
Halothane	(0.44)	3400	(0.29)	197	1.87	1.1	1	–
Heptane	(0.020)	2.9	(0.0073)	100	0.68	0.012	4	–
Hexachlorocyclopentadiene	0.0026	20	0.0077	273	1.70	23	1	1
Hexachloroethane	(0.65)	50	(0.010)	237	s	6.7	–	1
Hexane	(0.0024)	9.5	(0.0064)	86	0.66	0.014	2	–
Hexylene glycol		∞		118	0.92		1	–
Hydrazine (B/8.5)		∞	160	32	1.01		2	1
Hydrogen bromide (A)	d	1 200 000	d	81	g	d	1	–
Hydrogen chloride (A)	d	500 000	d	36	g	d	6	–
Hydrogen cyanide (A/9.2)	3.0	∞	0.17	27	0.70	270	2	3
Hydrogen fluoride (A/3.2)	d	∞_{19}	d	20	0.96	d	2	–
Hydrogen selenide (A/3.9)	(0.00035)	6800	(0.0021)	81	g	2.1	1	–
Hydrogen sulfide (A/7.0)	(0.036)	3500	(0.000029)	34	g	2.6	25	1
Indene	(0.18)	~40	(0.00026)	116	1.01	~3.7	1	1
Iodoform	1.3	110	0.011	394	s	130	3	–
Isoamyl acetate	66	1400	0.017	130	0.87	120	8	3
Isoamyl alcohol	630	26 000	0.27	88	0.80	1700	5	3
Isobutyl acetate	34	5900	0.15	116	0.87	48	3	1
Isobutyl alcohol	310	89 000	10	74	0.80	2100	7	5
Isophorone	140	12 000	5.4	138	0.92	4800	1	–
Isopropyl acetate	97	30 000	1.0	102	0.87	92	4	–
Isopropyl alcohol	3000	∞	160	60	0.78	3000	12	4
Isopropylamine (B/10.5)	20	∞	4.9	59	0.69	~1700	2	1
Isopropyl ether	12	10 000	0.00080	102	0.73	11	1	–
Maleic anhydride	d	d	d	98	s	d	1	–
Mesityl oxide	35	29 000	1.0	98	0.85	570	2	–
2-Methoxyethanol		∞		76	0.97		2	–
Methyl acetate	130	220 000	3.0	74	0.93	210	5	–
Methyl acrylate	4.5	49 000	0.0021	86	0.95	130	1	–
Methyl acrylonitrile	0.29	25 000	2.1	67	0.80	110	1	–
Methyl alcohol	1500	∞	740	32	0.79	5600	13	4
Methylamine (B/10.6)	7.4	550 000	2.4	31	g	580	2	3
Methyl *n*-amyl ketone	40	4300	0.28	114	0.81	170	2	2
N-Methylaniline (B/4.8)	5.3	6700_{30}	18	107	0.99	2400	1	–
Methyl *n*-butyl ketone	17	16 000	0.25	100	0.81	800	1	–
Methyl chloroform	(2.8)	1300	(0.97)	133	1.34	1.4	3	–
Methyl 2-cyanoacrylate				111	1.11		1	–
Methylcyclohexane	(0.092)	14	(0.15)	98	0.77	0.057	1	–
cis-3-Methylcyclohexanol	660	9300	6600	114	0.91	2800	1	–
Methylene chloride	3.6	19 000	9.1	85	1.34	10	4	1
Methyl ethyl ketone	310	210 000	8.4	72	0.80	530	8	1
Methyl formate	25	170 000	150	60	0.97	100	3	–
Methyl hydrazine (B/7.9)		∞		46	0.87		1	–
Methyl isoamyl ketone	56	5400	0.013	114	0.81	240	1	–
Methyl isobutyl carbinol	53	16 000	0.15	102	0.81	510	1	–
Methyl isobutyl ketone	94	18 000	1.3	100	0.80	460	5	–
Methyl isocyanate	d	d	d	57	0.96	d	1	–
Methyl isopropyl ketone	320	60 000	3.1	86	0.80	460	1	1
Methyl mercaptan (A/10.7)	(0.0075)	~14 000	(0.000024)	48	g	7.6	8	2
Methyl methacrylate	30	15 000	0.025	100	0.94	73	4	1
Methyl *n*-propyl ketone	270	54 000	15	86	0.81	380	2	1
α-Methyl styrene	7.4	560	0.043	118	0.91	31	3	1
Morpholine (B/8.7)		∞		87	1.00		1	–
Naphthalene	2.5	30	0.021	128	s	47	6	4
Nickel carbonyl	(0.000012)	130	(0.000072)	171	1.32	0.035	3	–

Table 2(a)—*Continued*

Substance	1 Threshold limit value (ppm; v/v)	2 Volatility at 25 °C (ppm; v/v)	3 Air odor threshold (ppm; v/v)	4 Standard error (×/÷)	5 Safe dilution factor	6 Odor safety factor	7 Odor safety class
Nitrobenzene	1	360	0.018	1.7	360	56	B
Nitroethane	100	27 000	2.1	–	270	46	B
Nitrogen dioxide	3	g	0.39	2.6	330 000	7.8	C
Nitromethane	100	47 000	3.5	–	470	29	B
1-Nitropropane	25	13 000	11	4.2	520	2.3	C
2-Nitropropane	10[n]	22 000	70	2.2	2200	0.14	E
m-Nitrotoluene	2	~280	0.045	–	140	45	B
Nonane	200	6000	47	4.1	30	4.3	C
Octane	300	18 000	48	3.2	61	6.3	C
Osmium tetroxide	0.0002	12 000	0.0019	–	61 000 000	0.10	E
Oxygen difluoride	0.05	g	0.10	–	20 000 000	0.50	D
Ozone	0.1	g	0.045	1.9	10 000 000	2.2	C
Pentaborane	0.005	270 000	0.96	–	54 000 000	0.0052	E
Pentane	600	670 000	400	1.9	1100	1.5	C
Perchloroethylene	50	25 000	27	1.8	490	1.8	C
Phenol	5	460	0.040	1.5	92	130	B
Phenyl ether	1	29	0.0012	3.7	29	800	A
Phenyl mercaptan	0.5	2000	0.00094	4.4	4100	530	B
Phosgene	0.1	g	0.90	1.7	10 000 000	0.11	E
Phosphine	0.3	g	0.51	2.5	3 300 000	0.58	D
Phthalic anhydride	1	0.67	0.053	–	0.7	19	C
Propane	140 000[i]	g	16 000	1.3	7	8.8	C
Propionic acid	10	5400	0.16	1.8	540	61	B
n-Propyl acetate	200	43 000	0.67	4.1	220	300	B
n-Propyl alcohol	200	26 000	2.6	1.7	130	78	B
Propylene	140 000[i]	g	76	3.0	7	1800	A
Propylene dichloride	75	69 000	0.25	–	920	300	B
Propylene glycol 1-methyl ether	100	16 000	10	–	160	10	C
Propylene oxide	20	700 000	44	4.5	35 000	0.45	D
n-Propyl nitrate	25	30 000	50	–	1200	0.50	D
Pyridine	5	27 000	0.17	1.4	5300	30	B
Quinone	0.1	130	0.084	3.0	1300	1.2	C
Styrene	50	9600	0.32	2.0	190	160	B
Sulfur dioxide	2	g	1.1	1.3	500 000	1.7	C
1,1,2,2-Tetrachloroethane	5	8400	1.5	2.1	1700	3.4	C
Tetrahydrofuran	200	230 000	2.0	5.4	1100	99	B
Toluene	100	37 000	2.9	1.6	370	34	B
Toluene-2,4-diisocyanate	0.005[n]	~21	0.17	2.9	4200	0.030	E
o-Toluidine	2	330	0.25	4.1	170	8.0	C
1,2,4-Trichlorobenzene	5	570	1.4	2.1	110	3.6	C
Trichloroethylene	50	99 000	28	1.7	2000	1.8	C
Trichlorofluoromethane	1000	g	5.0	–	1000	200	B
1,1,2-Trichloro-1,2,2-trifluoroethane	1000	430 000	45	–	430	22	C
Triethylamine	10[n]	93 000	0.48	2.1	9300	21	C
Trimethylamine	10[n]	g	0.00044	1.4	100 000	23 000	A
1,3,5-Trimethylbenzene	25	3600	0.55	1.9	150	45	B
Trimethyl phosphite	2	34 000	0.00010	–	17 000	20 000	A
n-Valeraldehyde	50	21 000	0.028	2.5	420	1800	A
Vinyl acetate	10	140 000	0.50	1.6	14 000	20	C
Vinyl chloride	5	g	3000	3.7	200 000	0.0017	E
Vinylidene chloride	5[n]	790 000	190	3.7	160 000	0.027	E
Vinyl toluene	50	2400	10	–	48	5.0	C
m-Xylene	100	11 000	1.1	2.1	110	92	B
2,4-Xylidine	2	190	0.056	–	97	36	B

Table 2(b)—*Continued*

Substance	9 Water TLV equivalent (ppm; w/v)	10 Solubility at 25 °C (ppm; w/v)	11 Water odor threshold (ppm; w/v)	12 Molecular weight (g)	13 Density at 20–25 °C (g ml^{-1})	14 Water–air distribution ratio (w/v)	Number of thresholds performed: air	water
Nitrobenzene	6.0	2100	0.11	123	1.20	1200	13	2
Nitroethane (A/8.4)	100	27 000	2.2	75	1.05	330	–	1
Nitrogen dioxide (A)	d	d	d	46	g	d	6	–
Nitromethane (A/10.2)	260	110 000	9.1	61	1.13	1000	–	1
1-Nitropropane (A/~8)	29	15 000	12	89	1.00	310	2	1
2-Nitropropane (A/7.7)	7.6	16 000	53	89	0.98	210	1	1
m-Nitrotoluene	3.6	500_{10}	0.080	137	1.16	320	1	–
Nonane	(0.0056)	~0.17	(0.0013)	128	0.72	0.0054	2	–
Octane	(0.011)	0.66	(0.0017)	114	0.70	0.0077	2	–
Osmium tetroxide (A/12.0)	0.0012	69 000	0.012	254	s	580	1	–
Oxygen difluoride	(0.0000054)d	100_{20}d	(0.000011)d	54	g	0.049d	1	–
Ozone	(0.00064)	6100	(0.00028)	48	g	3.2	6	–
Pentaborane	d	d	d	63	0.63	d	1	–
Pentane	(0.033)	38	(0.022)	72	0.62	0.019	3	–
Perchloroethylene	(0.31)	150	(0.17)	166	1.61	0.90	3	1
Phenol (A/10.0)	1000	85 000	7.9	94	s	52 000	16	6
Phenyl ether	150	4300	0.18	170	1.07	21 000	2	3
Phenyl mercaptan (A/6.5)	0.15	610	0.00028	110	1.08	66	2	2
Phosgene	d	d	d	99	g	d	6	–
Phosphine	(0.00011)	370_{17}	(0.00020)	34	g	0.27	6	–
Phthalic anhydride	d	d	d	148	s	d	1	–
Propane	(9.0)	62	(1.0)	44	g	0.036	2	–
Propionic acid (A/4.9)	1700	∞	28	74	1.00	56 000	11	2
n-Propyl acetate	92	$19\,000_{20}$	0.31	102	0.89	110	4	–
n-Propyl alcohol	1800	∞	23	60	0.80	3600	12	5
Propylene	(50)	350	(0.028)	42	g	0.21	3	1
Propylene dichloride	(3.0)	2800	(0.010)	113	1.16	8.8	1	–
Propylene glycol 1-methyl ether				90	0.92		1	–
Propylene oxide	14	370 000	31	58	0.83	300	2	–
n-Propyl nitrate	7.4	8800_{20}	15	105	1.05	69	1	–
Pyridine (B/5.2)	28	∞	0.95	79	0.98	1700	15	10
Quinone	11	14 000	9.3	108	s	25 000	2	1
Styrene	(1.7)	320	(0.011)	104	0.90	7.8	10	3
Sulfur dioxide (A/1.9)	0.19	88 000	0.11	64	g	37	13	–
1,1,2,2-Tetrachloroethane	1.7	2900	0.50	168	1.60	50	3	1
Tetrahydrofuran		∞		72	0.89		3	–
Toluene	(1.4)	540	(0.042)	92	0.86	3.8	18	2
Toluene-2,4-diisocyanate	d	d	d	174	1.22	d	4	–
o-Toluidine (B/4.4)	91	15 000	11	107	1.00	10 000	3	1
1,2,4-Trichlorobenzene	(0.23)	~26	(0.064)	181	1.45	6.1	1	1
Trichloroethylene	(0.55)	1100	(0.31)	131	1.46	2.1	7	1
Trichlorofluoromethane				137	1.49		1	–
1,1,2-Trichloro-1,2,2-trifluoroethane				187	1.56		1	–
Triethylamine (B/10.9)	8.8	71 000	0.42	101	0.73	210	4	1
Trimethylamine (B/9.7)	4.5	$410\,000_{14}$	0.00020	59	g	190	3	1
1,3,5-Trimethylbenzene	(0.67)	97	(0.015)	120	0.86	5.4	6	3
Trimethyl phosphite	d	d	d	124	1.05	d	1	–
n-Valeraldehyde	29	12 000	0.017	86	0.81	170	1	3
Vinyl acetate	1.8	$25\,000_{20}$	0.088	86	0.93	50	4	1
Vinyl chloride	(0.0057)	1100	(3.4)	62	g	0.44	3	–
Vinylidene chloride	(0.041)	6400	(1.5)	97	1.22	2.0	2	–
Vinyl toluene	(2.1)	~100	(0.42)	118	0.90	8.7	1	–
m-Xylene	(1.6)	170	(0.017)	106	0.86	3.7	8	2
2,4-Xylidine (B/4.9)	66	6400	1.8	121	0.97	6600	1	–

at 25 °C can be calculated[14] from the vapor pressure and the solubility at 25 °C. The coefficients for some of the compounds that are infinitely soluble in water at 25 °C were calculated from tabulated activity data[15] or measured experimentally.[14]

The results for *n*-butyl alcohol, which has provided the most plentiful odor-threshold data, are given in Table 1 as a demonstration of data reduction. The original threshold data, in a variety of concentration units, were converted[2] into common units of g l^{-1}. Any water dilution thresholds were further converted to the equivalent air dilution threshold, through multiplication by the air-water partition coefficient.[14] The relationship between odor-intensity sensation and odorant concentration is exponential.[16] Therefore, in order to preserve the normal distributions of olfactory-threshold measurements, all chemical concentrations of odorants were calculated on a logarithmic scale. Hence the geometric mean of all 29 odor thresholds, expressed in air dilution, was computed (by converting to the logarithms, finding their arithmetic mean, and taking its antilogarithm).[2] The mean air dilution threshold, in g l^{-1}, was finally converted to mg m^{-3}, and to ppm by volume.

Explanation of Table 2 (odor thresholds)

Column 1. Threshold limit values (TLV) adopted by ACGIH, 1982.[1] The superscript n indicates that the TLV used is the value proposed in the 1982 Notice of Intended Changes. The superscript i indicates an inert gas (simple asphyxiant) for which no TLV is assigned by ACGIH, merely a requirement that the oxygen content of the air not be reduced below 18%. This would be expected to occur if the asphyxiant reaches 14%, or 140 000 ppm, which is in effect the TLV for inert gases.

Column 2. The volatility in ppm (v/v) is given by the literature vapor pressure (in mmHg at 25 °C) multiplied by 1316 (1 000 000 ppm per 760 mmHg). ~ indicates approximate value obtained by extrapolating the linear regression from vapor pressures recorded at substantially higher temperatures. g, gaseous at 25 °C.

Column 3. Air-dilution odor thresholds are geometric averages of all available literature data, omitting extreme points and duplicate quotations. Odor thresholds originally measured in water dilution were converted to the equivalent air dilution, as illustrated in Table 1 for *n*-butyl alcohol.

Column 4. When two or more acceptable literature thresholds were located, the standard error of their mean was calculated. The standard error is the standard deviation divided by the square root of the number of literature thresholds. This factor is applicable to the data in columns 3, 6 and 10. The smaller the standard error, the greater the confidence that may be placed in the accuracy of the mean threshold value. (It should be borne in mind, however, that small standard error, based on only two thresholds, could itself be the result of a fairly probable coincidence.)

Column 5. Safe dilution factor, for the saturated vapor at 25 °C, is the volatility divided by the threshold limit value (column 2 divided by column 1). For substances that are less than infinitely soluble in water, the same safe dilution factor applies to the saturated solution at 25 °C (column 9).

Column 6. Odor safety factor is the threshold limit value divided by the odor threshold (column 1 divided by column 3). This factor may be interpreted quantitatively by reference to Fig. 2, in terms of what percentage of attentive persons can detect the TLV concentration, and what percentage of distracted persons will perceive a warning of the TLV concentration.

Column 7. The scale of odor safety classes is explained in Table 3. Class A substances provide the strongest odorous warning of their presence at threshold limit value concentrations, whereas class E substances are practically odorless at the TLV concentration.

Table 3. Odor safety classification

Class	Odor safety factor	Interpretation
A	> 550	More than 90% of distracted persons perceive warning of TLV concentration in the air
B	26–550	50–90% of distracted persons perceive warning of TLV
C	1–26	Less than 50% of distracted persons perceive warning of TLV
D	0.18–1	10–50% of attentive persons can detect TLV concentration in the air
E	< 0.18	Less than 10% of attentive persons can detect the TLV

Column 8. Water TLV equivalent is the concentration of the substance in water, which will generate the air TLV concentration in the headspace of a stoppered flask or other closed system. It is calculated from column 1 by multiplying by the distribution ratio in column 13, then dividing by 24 400 (volume in ml of one gram molecule of vapor at 25 °C) and multiplying by the molecular weight. Solutions with values in parentheses lack enough persistence for reference purposes, due to an unfavorably low water–air distribution ratio (< 10) in column 13; d, decomposes in water.

Column 9. Solubility in ppm (w/v) is the literature solubility (expressed as g l^{-1} of saturated solution at 25°C) multiplied by 1000. ~ indicates uncertain or extrapolated values. Temperatures other than 25 °C are indicated by subscripts.

Columns 10. Water-dilution odor threshold is the concentration of the substance in water which will generate the air odor threshold concentration in the headspace of a stoppered flask. It is calculated from column 3 by multiplying by the distribution ratio in column 13, then dividing by 24 400 and multiplying by the molecular weight. Values in parentheses have the same meaning as in column 8.

Column 11. The molecular weight (MW, rounded off to the nearest whole number expressed in grams) can be used to convert the air concentrations in ppm (v/v) (columns 1, 2 and 3) into mg m^{-3}. Multiply by MW and divide by 24.4 (volume in liters of one gram molecule of vapor at 25 °C).

Column 12. The density (D, at 20–25 °C) is needed when measuring out liquid odorants by volume to prepare water or air dilutions:

$$1 \text{ ppm (w/v)} = 1 \text{ mg } [\text{or } (1/D)\ \mu\text{l}] \text{ per liter of water}$$

$$1 \text{ ppm (v/v)} = \frac{\text{MW}}{24.4} \text{ mg } \left(\text{or } \frac{\text{MW}}{24.4 \times D}\ \mu\text{l}\right) \text{ per cubic meter of air}$$

g, gaseous at 20 °C; s, solid at 20 °C.

Column 13. The water-air distribution ratio is the reciprocal of the air-water partition coefficient. Where experimental values are unavailable in the literature, which is usually the case, the ratio has been calculated from data in columns 9, 2 and 11, or from other approaches mentioned earlier. An estimate of the water-air distribution ratio is given by dividing the solubility (column 9) by the volatility (column 2), then multiplying by 24 400 and dividing by the molecular weight (column 11).

Column 14. The numbers indicate how many original literature odor thresholds were included in calculating the average threshold in column 3 and the standard error in column 4. On the left is the number of air-dilution thresholds, and on the right the number measured in water dilution.

Ionizable odorants (weak acids and bases) are indicated in Table 2(b) by appending to the compound name the symbol A for acid and B for base, followed by the acid dissociation constant pK_a. Data given for such compounds in columns 8, 9, 10 and 13 are accurate only for solutions in which the odorant is practically un-ionized and hence potentially volatile. That is, the pH of the solution should be less than two pH units lower than the pK_a for an acid, or should be more than two pH units higher than the pK_a for a base. The odorant volatilities at pH values outside of these limits can be estimated by calculating the concentration of the un-ionized species using the Henderson-Hasselbalch equation.[16] For demonstration purposes, it will suffice to make solutions of the acids in 0.01 N H_2SO_4, and the bases in 0.01 N NaOH.

The data in Table 2 are incomplete for some physical properties of 25 compounds, because no literature values could be located, and no justifiable estimates could be made. The missing data are mostly water solubilities or water-air distribution ratios, which in turn preclude estimates of TLV equivalents in water and water-dilution odor thresholds. If the reader is aware of values for the missing data, or knows of more accurate measurements or estimates of the recorded data, the authors would be grateful for the information. Odor threshold data on TLV-listed compounds not included in Table 2 would also be welcome.

Variance of human responsiveness to odors

When the individual olfactory detection thresholds for a given compound are determined on a sample of the human population, the data typically generate a (log)normal or Gaussian distribution.[17] For this result, it is necessary to use a logarithmic scale for the odorant concentration, such as a binary or decadic dilution series. The quantitative interpretation of a Gaussian curve is facilitated by replotting the data on probability graph paper. The resulting probit approximates a straight line if the distribution of sensitivities in the population is in fact normal. Literature data on the percentages of persons responding to odorants when they were attentive,[18] distracted,[19] or asleep[20] were replotted as probits in Figs 1, 2 and 3.

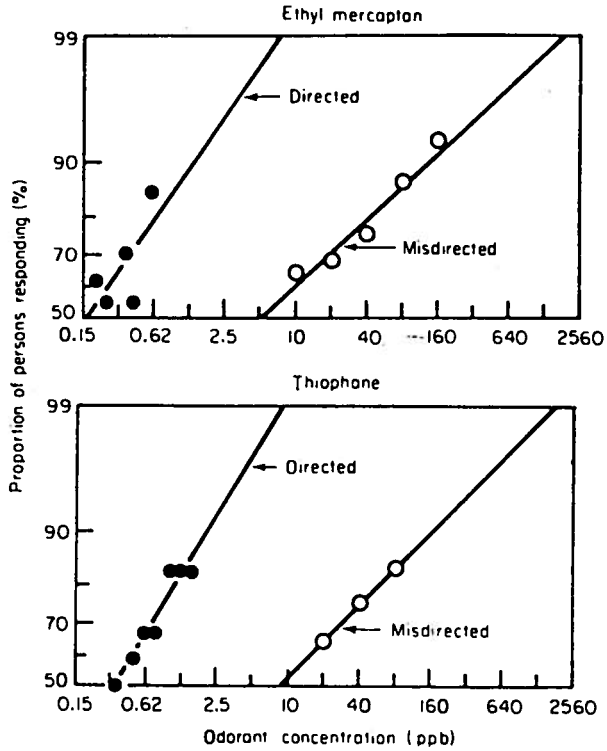

Figure 1. Tests of responsiveness of persons to fuel gas odorants. The data were taken from the report by Whisman *et al.*,[19] Figs 12 and 13, and Table 28, then re-plotted on log/probit coordinates. In the misdirected tests, the attention of the subjects was deliberately channeled to other matters. Note that the concentration units in this Figure are ppb (v/v).

Some chemicals, but not all, besides having a true odor, also cause immediate irritation in the nose, eyes or throat. The sensation of stinging, prickling or burning, conveyed by the trigeminal or 5th cranial nerve, is quite distinct from the smell sensation carried by the olfactory or 1st cranial nerve.[21] Irritation usually requires a higher chemical concentration than odor, and trained normal subjects can readily report the distinct irritation threshold.[22] Another approach is to use subjects who have suffered a chronic loss of their olfactory nerve function, but still retain an active trigeminal nerve sensitivity.[23]

Explanation of Table 4 (irritant thresholds)

Column 1. In this Table, each odor threshold was derived from the same source which reported the irritation threshold; hence the odor threshold in Table 4 may differ from that given for the same compound in Table 2(a), column 3, which may be an average of several literature values.

Columns 2 and 3. Irritation thresholds are the lowest concentrations that cause immediate stinging or burning sensations in the nose, or stinging or lacrimation of the eye.

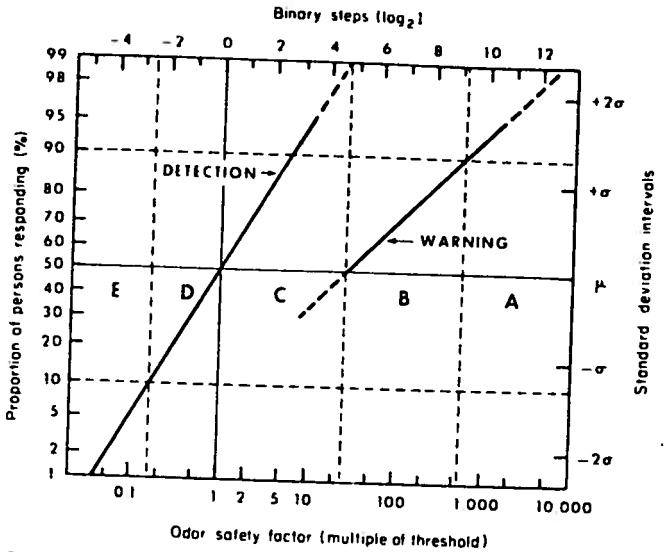

Figure 2. A practical guide to the quantitative interpretation of odor safety factors. The coordinates are log/probit, so care is required in interpolating between marked intervals. The sloping lines indicate the percentages of the population expected to respond to various fractions or multiples of the mean detection threshold concentration (1.0 on the *x* axis). The detection line represents the performance of fully attentive persons under good laboratory conditions. The warning line shows what may be expected for distracted persons under factory or field conditions. The warning line is based on the results of Whisman *et al.*[14] for the gas odorants ethyl mercaptan and thiophane.

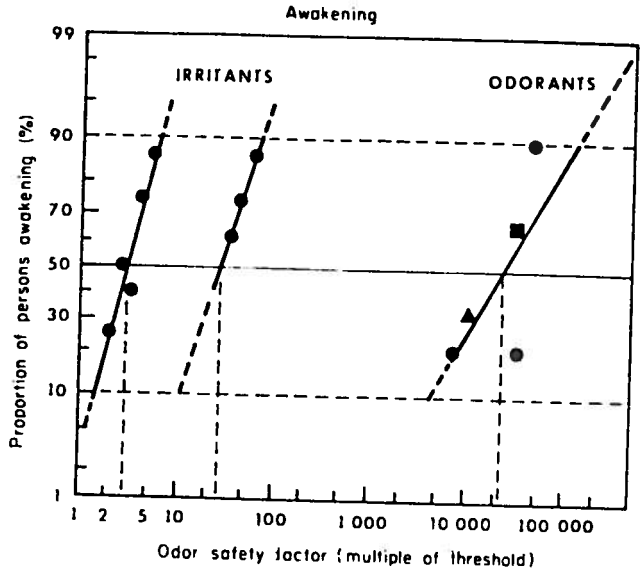

Figure 3. An illustration of the efficacy of certain vapors in awakening sleeping persons. The data were taken from the work of Fieldner *et al.*,[20] Tables 8, 12 and 14, then plotted on log/probit coordinates. The irritants were allyl alcohol on the left, and crotonaldehyde on the right. The odorants were ethyl mercaptan (●), phenyl ether (▲) and isoamyl acetate (■). The concentrations in this Figure are stated as multiples of the odor thresholds reported by Fieldner *et al.*[20]

In four compounds, designated by superscript a, they are the lowest concentrations that could be distinguished from pure air by a general anosmic, i.e. by a person who has no olfactory nerve sensation, but whose trigeminal nerve sensitivity is intact.

Column 4. The lower of the nose and eye thresholds (if both are available) was used for calculating this ratio of irritation and odor thresholds.

Column 5. The irritation hazard factor is obtained by dividing the nose or eye irritation threshold (whichever is lower, columns 2 or 3) by the threshold limit value from Table 2(a), column 1. This datum indicates by what multiple the TLV is exceeded, if eye or nose irritation can be detected.

Column 6. References in italics indicate that thresholds were obtained using water dilutions.

RESULTS AND DISCUSSION

Literature search for odor thresholds

The ACGIH compilation includes approximately 350 appreciably volatile compounds for which time-weighted average threshold limit values have been adopted or pro-

Table 4. Irritant threshold concentrations of ten industrial chemicals. See Methods for further explanation of each column

Substance	1 Odor threshold (ppm; v/v)	2 Irritation thresholds: Nose (ppm; v/v)	3 Irritation thresholds: Eye (ppm; v/v)	4 Ratio of irritation and odor thresholds	5 Irritation hazard factor	6 Reference
Acetaldehyde	0.066	2200	11 000	33 000	22	22
Acetic acid	0.16	160[a]		1000	16	*23*
Acrolein	1.8	11	12	6.1	110	22
Allyl alcohol	1.4	30	59	21	15	22
Benzyl chloride	0.040	35	8.0	200	8.0	22
α-Chloroacetophenone	0.040	0.034	0.022	0.55	0.44	22
trans-Crotonaldehyde	0.11	14	19	130	7.0	22
Formic acid	130	1100[a]		8.5	220	*23*
Propionic acid	0.24	370[a]		1500	37	*23*
Pyridine	0.71	700[a]		990	140	*27*

[a] Detection threshold for a general anosmic

posed.[1] Among these, there are 214 compounds for which we were able to locate at least one literature value for the olfactory detection or recognition threshold, measured in air or water dilution. The data are widely scattered in the literature, and there is little conformity in the choice of units for expressing the results. For example, the 29 reported thresholds for *n*-butyl alcohol (Table 1) were gathered from the works of 26 principal authors, who used 18 different systems of concentration units in publishing their data, in 24 journals. Furthermore, no two of these 29 thresholds were measured by precisely the same experimental method.

The lack of standardization, taken in conjunction with the inconsistent purity of the chemical samples and the variability of human sensitivity, is responsible for the rather wide range of threshold concentrations usually found in the literature for a given compound. As indicated at the foot of Table 1, the mean threshold for *n*-butyl alcohol is 0.835 ppm. (In this compilation, the data were collected and calculated to three significant figures, then rounded off to two significant figures for the Tables.) The threshold concentrations having been calculated as logarithms, statistical deviations and errors from the geometric mean should be stated in the form of factors (rather than the differences used with ordinary arithmetic means). The standard deviation of the logarithms of the observed thresholds was ± 0.854 $\log_{10}$ units, for which the antilog yields a factor of $\times/\div 7.14$. Taking into account all 29 literature values (i.e. dividing by $\sqrt{29}$), this reduces to a standard error of ± 0.159 $\log_{10}$ units, corresponding to a factor of $\times/\div 1.44$. This indicates that there is approximately a 68% probability ($\pm 1\sigma$ or SD) that the true threshold for *n*-butyl alcohol lies between $(0.835/1.44) = 0.58$ ppm and $(0.835 \times 1.44) = 1.20$ ppm. There is a 96% probability ($\pm 2\sigma$) that it lies between $(0.58/1.44) = 0.40$ ppm and $(1.20 \times 1.44) = 1.73$ ppm. Olfactory thresholds could, if necessary, be obtained with greater consistency and smaller standard errors, by determining conversion factors between different experimental methods,[2,3,14] or by redetermining the thresholds by using a standardized procedure with careful minimization of known sources of error.

In the literature, we found for these 214 compounds a total of 1054 acceptable thresholds. Some thresholds had to be rejected on the grounds that they had been measured without consideration of substantial ionization, unfavorable partition coefficients, likely impurities or the inapplicability of Raoult's law. A few remaining extreme points were discarded because they diverged more than 100-fold from the nearest of two or more other thresholds for the same compound.[24] For 152 of the compounds, we found two or more acceptable thresholds. We calculated the mean threshold and its standard deviation for each compound. The average of the individual standard deviations for all these 152 multiple threshold compounds was a factor of $\times/\div 7.0$. The remaining 62 compounds each yielded only one usable threshold, so no standard error could be calculated, which accounts for the dashes in column 4 of Table 2(a). The uncertainty in a given olfactory threshold measurement should be independent of whether the compound has been reported several times in the literature, or only once. As a rough guide, we may assume the same average standard error factor of $\times/\div 7.0$ for these single-threshold compounds.

Safe dilution factors for saturated vapors

The procedure of expressing threshold limit values, volatilities and odor thresholds all in the same units (ppm; v/v) brings to light certain relationships that are not apparent when miscellaneous units are used. Nearly all of the compounds in Table 2(a) have volatilities at 25 °C which exceed, sometimes by an enormous factor, their threshold limit values. Accordingly, a sniff, from the headspace of a bottle or drum, or from a confined space containing a spill, of almost any of these substances, inevitably exceeds the TLV. The safe dilution factor in column 5 indicates the minimum number of volumes of uncontaminated air that would be required to dilute, to the safe level, one volume of air that has been saturated by exposure to the named compound (assuming perfect mixing). Plant location, layout, ventilation, chimneys and emergency procedures should be designed with the realization of the safe dilution factor in mind, at least for compounds for which dilution ventilation is an allowable method of control. Any increase in temperature of the chemical above 25 °C increases the required safe dilution factor, in proportion to the vapor pressure.

A majority of these compounds are not completely miscible with water. Nevertheless, a saturated solution of any volatile compound is theoretically capable of saturating the headspace to the same concentration as the pure compound could achieve. Whether or not it will do so in a finite time depends upon the water-air distribution ratio, the relative volumes of air and water, and the degree of agitation. To err on the safe side, it would be prudent to use the same safe dilution factor in calculating the number of volumes of clean water which would be needed to dilute one volume of a saturated aqueous solution of the compound before discharge to a sewer, lagoon or river, where this is permitted.

Odor safety factors as chemical safeguards

When the threshold limit value is substantially higher than the odor threshold, the intrinsic odor of the compound usually, but not invariably, provides an indication of its presence, at a concentration level low enough that no harm is likely to the human observer. Conversely, if the odor threshold is much higher than the TLV, then anybody detecting the odor of the compound has a warning that a safe vapor concentration has already been exceeded. The exposed worker would be well advised to request a professional evaluation and perhaps instrumental assessment of the situation. It should be determined whether the applicable TLV criterion (time-weighted average, short-term exposure limit or ceiling value)[1] is likely to be exceeded in the particular working regime, and if so, what the health significance may be.

The potential warning power of a given chemical is conveniently expressed by the odor safety factor (column 6 of Table 2(a)), which is simply the TLV divided by the odor threshold. Any chemical with an odor safety factor less than 1.0 carries the risk that hazardous concentrations will not be detected by odor. Conversely, an odor safety factor greater than 1.0 bears the promise that a hazardous concentration could be perceived by smell. Nevertheless, the question of whether or not a hazardous concentra-

tion will actually be smelt, is quite complex, and depends upon a variety of circumstances. (A very few people, roughly 1 in 500, have no true sense of smell at all;[25] the existence of anosmic persons, while of some practical importance, is omitted from our discussion.)

The average odor threshold has not been sufficiently rigorously evaluated for all these compounds, many of which possess measured or implied standard errors as large as seven-fold. This is not, in principle, an insurmountable problem, because 63 compounds in Table 2(a), column 4, already have thresholds evaluated with standard errors less than two-fold. Equal, or better, accuracy could readily be attained by new experimental measurements on the deficient compounds.

The ability of members of the population to detect a given odor is strongly influenced by the innate variability of different persons' olfactory powers, their prior experience with that odor, and by the degree of attention they accord to the matter. The thresholds listed in column 3 of Table 2(a) represent the most favorable conditions for testing. The subjects were well aware that these were tests of their sense of smell, they were attentive and they were trying their best to detect the presence of the odor. Even so, the odor-detecting ability of different people varies over quite a wide range. The compilation of individual sensitivities to a given compound typically yields a Gaussian or bell-shaped curve,[17] provided that a logarithmic concentration scale is employed. For this normal distribution, the standard deviation is a measure of the spread of odor sensitivity in the population. We have evaluated this standard deviation with seven odorants: isobutyl isobutyrate, isovaleric acid, 1-pyrroline, trimethylamine, isobutyraldehyde, androst-16-en-3-one and pentadecalactone, each tested with 18–443 normal observers. The average standard deviation was ± 1.97 binary steps, which may be rounded off at two binary steps.[18] The standard deviation indicates that 68% of people tested, on the average, will have a personal threshold that lies within the range from one-fourth of the mean, to four times the mean, threshold of the population.

The effect of distracted attention

In connection with testing the efficacy of certain odorants as warning agents for fuel gas, Whisman *et al.*[19] conducted a thorough study of the influence of various degrees of distraction on the responsiveness of people to these well-known warning odors. Their 'directed' test corresponds with usual laboratory conditions, in which the attention of the subject is purposely focused on the sole objective of detecting an odor. In the 'semi-directed' test, the subjects were asked to report on visual, tactile, aural and nasal stimuli in the test room. In the 'undirected' test, the subjects were given no indication of the object of the exercise. In the 'misdirected' test, the attention of the participants was deliberately distracted by asking each to try to read some print in a dim light and to judge the temperature of the room. All except the directed tests were performed with inexperienced subjects recruited by a mobile laboratory arriving unannounced at shopping centers, and each volunteer was used for one test only at one odorant concentration.

Whisman *et al.* found that the responsiveness of the subjects to a given concentration of odorant was substantially decreased in the semidirected, undirected and misdirected tests, compared with their performance in the directed test mode. The misdirected test was probably the most difficult set of conditions imposed upon the subjects. In our opinion, the misdirected test is the most appropriate of the available models for evaluating the effects of conditions encountered in industrial practice. A factory worker would not be familiar with odor-threshold testing techniques, but would hopefully be aware that chemical vapors may be hazardous, and might know that a distinct smell indicates the presence of appreciable vapor in the air. On the other hand, the worker is likely to be concentrating on following instructions, reading charts, controlling equipment and generally trying to get the work done. Such a degree of mental distraction, as Whisman *et al.* showed, is ample to divert attention away from any but the most obvious of odors.

In Fig. 1, the results of Whisman *et al.*[19] for their directed and misdirected test modes are presented in $\log_2$/probit coordinates, which have the advantage of exhibiting an approximately linear relationship between olfactory stimulus and response. Each data point in the directed tests was obtained from 22 subjects, and in the misdirected tests from over 100 subjects. The data points were fitted by a logarithmic transformation linear regression, from which the slope and 50% response intercept were obtained. The directed test threshold for ethyl mercaptan, at which 50% of the subjects would respond, was found by extrapolation to be 0.17 ppb. In the misdirected test situation, however, the 50% response threshold was at 4.8 ppb, or 28 times higher. Furthermore, the slope of the regression line is shallower, so that disproportionately higher concentrations are required to elicit a response from 90% of the participants. The results for thiophane (tetrahydrothiophen) are virtually superimposable upon those for ethyl mercaptan, except that about double the concentration of odorant is needed to achieve a given level of response. That is, 0.35 ppb for detection threshold and 8.7 ppb for misdirected threshold, or 24 times higher.

The good agreement between the results for ethyl mercaptan and for thiophane encourages us to generalize the data, so as to provide a practical guide for interpreting threshold ratios and odor safety factors (Fig. 2). This graph is set in log/probit coordinates. Since neither the logarithmic nor the probit scales go to zero, the origin of the graph is considered to be the intersection of threshold multiple 1.0 on the x axis, with 50% persons responding on the y axis. This, by definition, is the average detection threshold, measured under laboratory conditions, i.e. a directed test. The logarithmic binary step concentration scale and the standard deviation intervals are also entered in Fig. 2. It was previously demonstrated[18] that the sensitivities of people to various odorants exhibit standard deviations close to 2.0 binary steps. Hence, the detection line in Fig. 2 is based on this generalization, and constructed by drawing a line with a slope of 2.0 binary steps per standard deviation unit, through the origin of the graph. The detection line is shown as a broken line above 95% response, because there are some indications that a small percentage of the population has specific anosmias to one or more of the sulfurous odorants.[17] Such persons, while they may perceive most other odors normally, are found to have an innate lower sensitivity or 'odor blindness' to the typical gas odorants.

The warning line in Fig. 2 is based on the average of the misdirected data for both ethyl mercaptan and thiophane. It was constructed as follows. The results for ethyl mercaptan and for thiophane (Fig. 1) showed that the ratios of the 50%-detection thresholds in the misdirected and directed test protocols were 28.3 and 24.5, respectively. Their geometric mean is 26.3, which was rounded off to 26 for the threshold multiple. In Fig. 2, the warning line is drawn to intersect the 50% response level at the threshold multiple value of 26-fold. The slope of the warning line was likewise determined by averaging the slopes of the regression lines for the misdirected tests in Fig. 1. The averaged warning line has a slope of 3.5 binary steps per standard deviation unit.

Therefore, in order to be perceived by 50% of distracted subjects, the concentration of gas odorant had to be raised to 26 times the concentration that could be detected by 50% of attentive subjects in laboratory test conditions. This illustration lends emphasis to the compelling conclusion of Whisman *et al.*[19] that there is a substantial difference between the level of odorant that *can* be detected, and the level that *will* be detected, in a given set of circumstances. The available data do not permit extrapolation of the warning line in Fig. 2 below the 50% response level.

Odor safety classification of chemicals

Figure 2 represents a provisional synthesis of the best available data. The slope of the detection line appears quite soundly established, and to be applicable to many chemicals. For those uncommon chemicals that exhibit a pronounced and frequently occurring specific anosmia among members of the population,[26] the curve is expected to flatten at higher response percentages. The slope and intercept of the warning line, however, are based on only two, quite closely related, fuel gas odorants. Intuitively, we feel that the results for ethyl mercaptan and thiophane represent a relatively favorable case, because, thanks to the public awareness developed by the suppliers of household and bottled gas, it is a widely known fact that the 'smell of gas' is an indication of danger. In other words, gas odorants may have a better chance of penetrating the consciousness of a distracted person than many other odors that are not mentally associated with harmful consequences.

Until more data become available, we propose that the relationships in Fig. 2 can be used to set up a provisional classification of the 214 chemicals, according to the level of safety indicated by their odors. For this purpose, we are adopting the 10%, 50% and 90% response levels as practical guides. According to Fig. 2, the obvious benchmarks are the detection threshold at which 50% of people can perceive the odor, and the higher warning threshold at which 50% of people will notice the odor even when they are distracted. Secondary criteria are provided by the concentrations at which 10% of attentive people can detect the odor, and the other extreme where 90% of distracted people get a warning of the odor. These four borderlines are indicated by vertical lines in Fig. 2.

Our tentative odor safety classification is presented in Table 3. At their threshold limit value concentration, class A compounds will be perceived by 90% of distracted persons. To achieve this rating, the odor safety factor must be at least 550; i.e. the threshold limit value for the compound is more than 550 times higher than its odor threshold. At the other extreme, class E compounds at their TLV concentration can be detected by less than 10% of attentive persons. In this category, the odor safety factor is below 0.18. The quantitative ranges for the intermediate B, C and D classifications are as indicated in Table 3. The zones of odor safety factor for the five classes are also labeled on Fig. 2. The odor safety class of each of the 214 compounds, for which adequate data are available, are entered in column 7 of Table 2(a). Class A compounds provide the strongest odorous warning of their presence at the TLV level, whereas class E compounds are practically undetectable by odor at their TLV concentration.

The effect of sleeping

Although it is not considered relevant to most workplace situations, the power of an odorant to waken a sleeping person is significant where industrial products can escape into a residential area. This is an obvious risk with household gas, and the question was included in a study by Fieldner *et al.*[20] Their data for several odorants are displayed in $\log_{10}$/probit coordinates in Fig. 3. They tested three compounds (ethyl mercaptan, phenyl ether and isoamyl acetate) which can be regarded as more or less purely olfactory stimulants, i.e. they have little or no irritating power for the trigeminal nerve. Each data point in Fig. 3 was calculated from the results of tests with three to eight sleepers. The points were then fitted by linear regression. The performances of these three odorants seem fairly concordant, and imply that an odorant concentration about 20 000 times the normal detection threshold is required to awaken 50% of soundly sleeping persons. That is more than 700 times stronger a stimulus than suffices to serve as a warning for wakeful, but misdirected, observers (Fig. 2). If this result were applicable to all odorants, it would mean that virtually none of the 214 compounds examined in Table 2(a) would awaken the average person, without exceeding the TLV.

There is, however, a complicating factor. Some odorants, besides stimulating the olfactory nerve, also irritate the trigeminal nerve. Two examples are included on the left side of Fig. 3. These substances were far more effective in waking the sleepers. A 50% response was obtained at 27 times the odor threshold of crotonaldehyde, and at only three times the odor threshold of allyl alcohol. From the comments of those that woke up, it is obvious that the irritation was the determining factor. It is an interesting observation that the trigeminal nerve has some sort of a 'hot line' directly into the subconscious, that is denied to the olfactory nerve.

Some data on irritant thresholds

Trained normal observers can report distinct concentration levels at which a vapor produces nasal or eye irritation, quite apart from its odor. Katz and Talbert[22] tabulated considerable data, from which we have selected those compounds that are on the ACGIH list (Table 4). We have also added a few compounds from our own work, in which nasal irritation thresholds were obtained from an anosmic person lacking the ability to perceive true odors as opposed to irritants. The ratio of the irritation and odor

thresholds for these compounds ranges from 33 000 for acetaldehyde, to less than unity for α-chloroacetophenone. Where this ratio is relatively small, it seems very likely that irritation would become an important factor in determining the intercept and slope of the warning line in Fig. 2.

If irritation of the trigeminal nerve can wake a sleeping person so effectively, it seems very likely also to be able to preempt the attention of a distracted person. No quantitative treatment of this factor is possible at present, because irritant thresholds are available for so few of the compounds on the TLV list, and no tests have been reported on perception of irritants by distracted persons. It may, however, be worth noting the irritation hazard factor in column 5 of Table 4. These figures indicate the degree to which the TLV is being exceeded, if there is appreciable eye or nose irritation for an attentive subject.

Threshold in water dilution

Many of the odor thresholds found in our literature survey had been measured by sniff-tests from the head-space above aqueous dilutions. Theoretically, the air-dilution threshold and the water-dilution threshold are simply related by the air–water partition coefficient of the odorant, provided the concentrations are measured in equivalent weight per volume units. This expectation has been borne out in comparisons made for *n*-butyl alcohol, pyridine and isovaleric acid,[14] and has been further supported by the data for many compounds listed in Table 2(b). For example, the data for *n*-butyl alcohol in Table 1 exhibit, for the reported olfactory thresholds, more than a 1000-fold range, yet the group means of the 20 air thresholds and the nine water thresholds differ by a factor of only about three-fold, and this is not considered significant ($P > 0.1$). Odor thresholds measured in air and water dilutions are generally concordant, unless the water–air distribution ratio is less than approximately ten. In that case, the reported water-dilution threshold concentration is liable to be too high, due to substantial evaporative loss of odorant from the solution during the course of conducting the odor threshold tests.

The air-dilution thresholds in column 3 of Table 2(a) are based on a pool of all available data from both air- and water-dilution measurements, omitting water thresholds for compounds with unfavorable water–air distribution ratios. The water dilution thresholds in column 10 of Table 2(b) were generally calculated from the data in column 3 of Table 2(a), by applying the water–air distribution ratio. In this way, we have been able to calculate water-dilution thresholds for many compounds for which only air-dilution threshold data were previously available. By applying the same distribution ratio, the water equivalent concentrations were also calculated for the TLV, and are listed in column 8 of Table 2(b). With odorants that are ionizable (acids and bases), these calculations are strictly valid only within specified pH limits, as explained in the Methods section.

We felt that it would be informative to provide the theoretical water threshold and TLV data, even for compounds with distribution ratios of less than ten. The equilibrium air concentration can develop and persist in conditions of high liquid–vapor volume ratio and low vapor loss, such as a closed vessel or a sewer. TLV and threshold data for odorants with distribution ratios less than ten are in parentheses in Table 2(b). This is to indicate that those solutions lack enough persistence to serve as reliable standards in setting up water dilution sniff-tests for training or testing personnel.

CONCLUSION

The interpretation of these data in any particular safety or pollution problem will depend markedly on the individual circumstances. The threshold data in the Tables and Figures are based on averages for samples of the population, presumably in good health. Individuals can differ quite markedly from the population average in their smell sensitivity, due to any of a variety of innate, chronic or acute physiological conditions.[23, 28, 29] Likewise, the time-weighted average threshold limit values are for workers, who by the mere fact of being able to work evidently represent a generally healthy segment of the population.

Continuing exposure to an odor usually results in a gradual diminution or even disappearance of the smell sensation. This phenomenon is known as olfactory adaptation or smell fatigue.[30] If the adaptation has not been too severe or too prolonged, sensitivity can often be restored by stepping aside for a few moments to an uncontaminated atmosphere, if available. Unfortunately, workers chronically exposed to a strong odor can develop a desensitization which persists up to two weeks or more after their departure from the contaminated atmosphere. In such cases, it should be the responsibility of supervisors and inspectors to note the odor and take appropriate action.

Hydrogen sulfide and perhaps other dangerous gases can very quickly lose their characteristic odor at high concentrations. At levels of H_2S above 100 ppm (over 10 000 times the average detection threshold), the sense of smell is rapidly abolished, so that potentially lethal concentrations may not be detected by odor at all.[31] Certain commercial diffusible odor masking or suppressing agents may reduce the perceptibility of odors, without removing the chemical source. The use of such agents might interfere with the capability of the nose to provide a warning at the expected concentration level.

There are many potential applications of these data in chemical safety and in air- and water-pollution control, some of which have been mentioned previously. In addition, we believe that the data might find some less apparent uses: Table 2 is also a guide to what data are in the literature on odor thresholds, on TLV-listed substances, is unavailable, unconfirmed or erratic. Readily prepared water dilutions could be used to test the individual smell thresholds of workers to the chemicals they handle. A water TLV dilution of an odorant could be prepared to demonstrate quickly to workers the practical experience of its TLV concentration. The general experimental procedures for preparing and testing aqueous solutions of odorants have been described.[32] These concepts could improve the reliability of odor breakthough as an indication of when to change the organic vapor cartridge in a respirator. The feasibility might be considered of using class A or B compounds as warning odorants to be added to class D or E substances, or to pesticides. The water–air distribution ratios could also be a guide to the possible success of water-scrubbing as a means of removing vapors from effluent gases.

The TLVs used in Table 2 and discussed in this paper are those recommended by the ACGIH in its 1982 listing.[1] The values are re-published annually, and are subject to revision, usually with two years notice of intended changes. The US Government Occupational Safety and Health Administration (OHSA) and many State Administrations have established their own lists of permitted exposures. While the values adopted are often based on the ACGIH recommendations, they may not coincide with current ACGIH TLVs, and quite different standards may be set for certain compounds. Some foreign governments issue guidelines with independently derived limits. If the applicable exposure limit for a particular compound is different from the TLV cited in Table 2, column 1, it will be necessary to adjust the values in columns 5, 6 and 8 by the appropriate ratio, and perhaps reassign the odor safety class (column 7). Values in Table 4, column 5 may also have to be altered.

Every chemical that can be detected by smell exhibits a property that can be turned to advantage as an aid in maintaining safe operating conditions. It must be recognized that background odors, odor fatigue, preoccupation and individual insensitivity may combine to reduce the margin, if any, between odor detection and safe operating conditions. No odor safety factor is large enough to justify condoning the presence of a fleeting odor, let alone a persistent stench, unless professional assurance has been obtained that the working conditions are safe.

The first detectable odor should be a sure signal that something abnormal has happened somewhere. It may be the last warning. During chemical operations, when an odor is detected, the source should be located and the concentration determined. Then effective steps can be taken to prevent the escape of vapor, and restore a neutral and healthful odor background. Even in the unnatural environment of the industrial workplace, our sense of smell has much to offer as a natural safety warning system.

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Received 17 August 1982; accepted (revised) 15 February 1983

SUPERVISOR'S INCIDENT INVESTIGATION REPORT

KOPPERS

1 DEPARTMENT: GRENADA PLANT
2 DATE OF OCCURRENCE: 2-27-84
3 TIME: ☐ AM ☒ PM — 11
4 DATE REPORTED: 2-28-84

INJURY OR ILLNESS		PROPERTY DAMAGE		OTHER INCIDENT	
5 INSURED'S NAME		11 PROPERTY DAMAGED		17 PERSON REPORTING INCIDENT: R. C. Bartlow	
6. OCCUPATION	7 PART OF BODY AFFECTED?	12 ESTIMATED COSTS	13 ACTUAL COSTS	18 OCCUPATION: Plt Mgr	19 COST (IF APPLICABLE) $ 600.00
8 NATURE OF INJURY/ILLNESS		14 NATURE OF DAMAGE		20 NATURE OF INCIDENT: CREOSOTE SPILL	
9 OBJECT/EQUIPMENT/SUBSTANCE/INFLICTING INJURY/ILLNESS		15 OBJECT/EQUIPMENT SUBSTANCE/INFLICTING DAMAGE		21 OBJECT/EQUIPMENT/SUBSTANCE/RELATED: FROM TREATING CYL.	
10 PERSON WITH MOST CONTROL OF ITEM 9		16 PERSON WITH MOST CONTROL OF ITEM 15		22 PERSON WITH MOST CONTROL OF ITEM 21: TREATING OPERATOR	

DESCRIPTION

23. DESCRIBE CLEARLY HOW THE INCIDENT OCCURRED

#1 TREATING CYLINDER HAD JUST BEEN CLEANED THE MANHEAD REINSTALLED & TESTED WITH 90# AIR PRESSURE. AFTER THE START OF THE 1ST TREATING CYCLE THE TREATING OPERATOR CHECKED OUTSIDE, AS REQUIRED AND FOUND THE LEAKING MANHEAD, CREOSOTE WAS SPRAYING OVER THE SPILL WALL ABOUT 15' AWAY. PRESSURE WAS CUT & THE SPILL PLAN IMPLEMENTED. THE FLOW WAS CONTAINED WITH SAND IN APPX 200'. I WAS NOTIFIED AT 11:15 AND CONTAINMENT WAS COMPLETE. FREE LIQUID HAS BEEN PICKED UP AND

ANALYSIS

24. WHAT ACTS, FAILURES TO ACT AND OR CONDITIONS CONTRIBUTED MOST DIRECTLY TO THIS INCIDENT?

SAW DUST SPREAD OVER THE AREA. THE SAWDUST AND CONTAMINATED SOIL WILL BE PICKED UP AND HANDLED APPROPRIATELY AS HAZARDOUS WASTE. THE SPILL DID NOT ENTER ANY WATERWAY.

24. BECAUSE OF WARPAGE THIS MANHEAD HAS ALWAYS

25. WHAT ARE THE BASIC OR FUNDAMENTAL REASONS FOR THE EXISTENCE OF THESE ACTS AND OR CONDITIONS?

BEEN DIFFICULT TO RESEAT; HOWEVER IT HAS BEEN POSSIBLE. APPARENTLY INSTALLATION WAS NOT SATISFACTORY AS THE MANHEAD GASKET BLEW OUT ON ONE SIDE

EVALUATION:

26 LOSS SEVERITY POTENTIAL: ☐ Major ☒ Serious ☐ Minor

27 PROBABLE RECURRENCE RATE: ☐ Frequent ☐ Occasional ☒ Rare

PREVENTION

28. WHAT ACTION HAS OR WILL BE TAKEN TO PREVENT RECURRENCE? NUMBER ALL ITEMS IN SEQUENCE

THE MANHEAD SYSTEM WILL BE REMOVED AND REPLACED WITH AN 16" DIA PIPE & BLIND FLANGE SYSTEM PRIOR TO RESUMING TREATMENT IN THIS CYLINDER.

Spoke w/ Roy Barlow today. Roy is using ASME Code welders, etc. He will discuss w/ GRM to ensure records certification etc. are all handled properly.
TAM.
3/5/84.

29 CIRCLE NUMBER AND GIVE DATE OF INTERMEDIATE ACTION ... OUT NUMBER AND GIVE DATE WHEN COMPLETED

INTERMEDIATE 1 2 3 4 5 6 7 8

COMPLETED 1 2 3 4 5 6 7 8

30 INVESTIGATED BY: [signature] | 31 DATE: 2-28-84 | 32 REVIEWED BY | 33 DATE

Koppers Company, Inc.
Environmental Resources Department
Pittsburgh, PA 15219. Telephone 412-227-2000

CERTIFIED MAIL
EXPRESS

KOPPERS

June 12, 1984

Mr. Jack M. McMillan, Director
Bureau of Pollution Control
Division of Solid Waste Mgt.
Mississippi Department of Natural Resources
P. O. Box 10385
Jackson, Mississippi 39209

RE: Part B Application
Your Letter of March 19, 1984
Order No. 70584
MSD 007027543

Dear Mr. McMillan:

This letter is in response to your letter of March 19, 1984 and Order No. 70584.

Several events are ongoing at this time to deal with Interim Status compliance and the completion of the Part B Permit Application for this facility. The following is a summary of activities and submissions:

1) Koppers' letter of June 12, 1984 to you from Mr. Raymond Bartlow, Plant Manager (Reply to your letter of May 8, 1984).

   a. Contains a schedule to conduct BTU analysis on waste being recycled for fuel at this plant's wood waste, cogeneration facility.

   b. Security - A revised Part A was prepared with supporting cost documentation to allow construction of a new 32' x 32' steel building for storage of containerized waste. A schedule of work was enclosed.

   c. Koppers addressed the concerns of the Department for the spray irrigation practices. A reply was requested of the Department.

   d. Groundwater sampling and analysis have been scheduled to look at both drinking water and indicator parameters.

   e. A Student t test was provided for existing data.

   f. Replicated sampling was acknowledged as required and will be performed on all current and future sampling.

continued

2) Mr. Herrmann's letter of May 16, 1984 concerning Appendix VIII constituents is presently being addressed by Koppers' Analytical Department. A reply will be sent to Mr. Herrmann in early June, 1984 and a sampling date will be set. (See schedule of Item 1 (d) above).

In addition to the above submission, Koppers submits in compliance with Order No. 70584 the schedule found in Attachment A for development of required data.

We trust that this reply meets with your requirements and the spirit of cooperation suggested by the Order.

Sincerely yours,

Charles P. Brush, P.E.

CPB/s
encl. - Attachment A

cc: Mr. Charlie L. Blalock, Executive Dir.
Mississippi Commission Natural Resources
P. O. Box 20305
Jackson, MS. 39209

Raymond Bartlow - Plant Manager

ATTACHMENT A

Koppers' Letter of June 12, 1984

Reply to the Mississippi Commission on Natural Resources Order No. 70584

SCHEDULE TO DEVELOP REQUIRED INFORMATION

ITEM	COMPLETION DATE
Site Survey and Mapping	September, 1984
Sample Wells & Report Analysis	October, 1984
Sample BTU and Report Analysis	August, 1984
Koppers' Comments on Appendix VIII Contaminants	June, 1984
Koppers' Samples for Appendix VIII	July, 1984
Koppers Reviews Point of Compliance Well Locations with State	July, 1984
Koppers Drills New Wells and Samples	September, 1984
Koppers submits Analysis of New Wells Sampling Data	November, 1984
Hydrogeologic Settling Review Completed	November, 1984
Engineers Certification of Dike	December, 1984
New Storage Facility Constructed	October, 1984
Revised Groundwater Monitoring Plan	December, 1984
Revised Closure Plan and Cost Estimate	January, 1985

Charles P. Brush
June 12, 1984

Koppers Company, Inc.
Environmental Resources Depart
Pittsburgh, PA 15219, Telephone 227-2000

CERTIFIED MAIL

KOPPERS

June 6, 1984

Mr. John Hermann
Division of Solid Waste Management
Mississippi Department of Natural Resources
P. O. Box 10385
Jackson, MS 39209

RE: Sampling at Tie Plant,
Mississippi
MSD007027543

Dear Mr. Herrmann:

This letter is to confirm our discussion of June 4, 1984. Kopper's shall sample its existing wells at the Tie Plant facility within the next few weeks, (as soon as the sampling team can schedule) for the following:

1. Groundwater Quality Parameters - Next 4 quarters.
2. Indicator Parameters - " " "
3. Drinking Water Parameters - Once (including pesticides and radioactives)

In addition to this information on sampling, I want to call your attention to our letter of January 25, 1984 (copy attached) which you did not have in your records as of April 25, 1984 during my visit. Look carefully at this letter because it corrects the October 25, 1983 submission.

Sincerely yours,

Charles P. Brush

Charles P. Brush, P.E.
Manager, Environmental
Planning and Regulatory Analysis

CPB:eo

Writer's Direct Dial Number (412) 227-2877

FILE COPY

May 8, 1984

Mr. Ray Bartlow
Koppers Chemical Company
P. O. Box 160
Tie Plant, Mississippi 38960

Dear Mr. Bartlow:

Re: MSD007027543

John Herrmann of my staff met with you and Charles Brush at your facility on April 26, 1984. As a result of the inspection, the following items are brought to your attention:

Item	Regulatory Cite	Comment
(1)	265.13; Waste Analysis	Koppers needs to implement its waste analysis plan for wastes which are generated on-site. Insufficient information is currently available as to whether burning the sludge constitutes a "legitimate reuse." The BTU value of the waste (prior to mixing with wood chips, etc.) must be determined for both on-site and off-site wastes being burned in the boiler.
(2)	265.14; Security	Records of inspections have not included security. The unauthorized container accumulation/storage area does not comply with the security requirements. Koppers should submit a schedule for upgrading the existing storage areas to meet these requirements.
(3)	265.75; Annual Report	The annual report for calendar year 1983 has not been received. The report was due March 1, 1984. In addition, copies of all annual reports should be maintained in the operating record.

(4) 265.77; Reporting

Although a spill report was verbally given to the Bureau (Bob Rogers) regarding the incident of February 28, 1984, the incident must be followed up in writing. A copy of the report submitted to the corporate office would probably be sufficient for future reports. Whenever the contingency plan is implemented, an entry should be placed in the operating record. In addition, the waste material should have been analyzed prior to disposal, per the Waste Analysis Plan, since this material was likely to be different than the normally generated waste.

(5) 265.90-94; Groundwater Monitoring

The interim status groundwater monitoring system and the associated reporting are insufficient for compliance with these standards:

(a) A full year of monitoring for indicator parameters, e.g. TOH, must be done with the required replicates. In addition, the drinking water standards have not been analyzed for.

(b) It appears that the facility is affecting groundwater, based on the most recent data; the regulations require additional sampling and/or the submission of an assessment plan. Copies of the statistical analysis performed by Koppers for the indicator parameters must be submitted.

		(c) The upgradient well appears to be unduly influenced by past practices and may not be truly indicative of background groundwater quality. An additional upgradient well is required.
		(d) Downgradient wells are not located at the compliance point.
(6)	265.170; Storage in Containers	Hazardous wastes have apparently been stored in an area not authorized in the Part A. The Part A should be revised to reflect this change.
(7)	265.173; Storage in Containers	Two drums were not tightly sealed during storage. In addition, another drum showed evidence of seepage around the bottom bung-hole.
(8)	265.192; Storage in Tanks	The flocculation tanks (open tanks) should be included on the revised Part A. In addition, these tanks must be inspected per 265.192(c).

The facility's impoundment appears to be operated and managed properly. The facility's land treatment area did not show a significant build-up of sludge; however, the soil had an odor indicative to wood treating waste. Therefore, we recommend that the water entering the spray field be sampled and analyzed for K001 constituents and, if necessary, that this unit be included in the facility's Part A. Finally, with respect to the inspection of the spray field, it appeared that the ground was saturated and that a significant water run-off problem might be developing -- i.e., the water standing around the periphery of the unit had been there for some time. Prior to disposal of this material (if other than respraying of the field), the Bureau should be contacted.

Please respond to the above citations by June 15, 1984.

Sincerely,

Jack M. McMillan, Director
Division of Solid Waste Management

JMM:hdb
cc: Mr. Charles Brush, Koppers Corporate Office

August 10, 1983

FILE COPY

Mr. Ray Bartlow
Koppers Chemical Company
P. O. Box 160
Tie Plant, Mississippi 38960

Dear Mr. Bartlow:

Re: Interim Status Inspection
and Groundwater Monitoring
Inspection of MSD007027543
on July 20, 1983

Interim status and groundwater monitoring inspections of your facility were conducted on the above mentioned date.

The interim status inspection revealed two areas that were out of compliance. The first area out of compliance was Facility Personnel Training (265.16c). The Mississippi Hazardous Waste Regulations require an annual review of the training for all personnel that handle hazardous waste. The last training session was conducted on March 3, 1982. At the time of the inspection, training had not been conducted for the year 1983.

The second area out of compliance was the closure plan. This plan generally described your steps for closure. However, it did not have a detailed description of how and when the facility will be closed; steps to decontaminate the facility equipment; and a schedule for final closure that includes dates when wastes will no longer be received, a date for completion of final closure, and intervening milestone dates. Attached to this letter is a closure checklist that could be helpful.

A review of and comments concerning the groundwater inspection will be addressed in a separate letter at a later date.

In consideration of the recent Part B permit application request sent to you, it will not be necessary to address correction of the above items at this time. However, these items should be given the appropriate attention during preparation of the Part B.

If we may be of further assistance, please advise.

Sincerely,

Robert A. Lee
Division of Solid Waste Management

RAL:hdb
Attachment

MISSISSIPPI DEPARTMENT OF NATURAL RESOURCES
Bureau of Pollution Control
P. O. Box 10385
Jackson, Mississippi 39209
(601) 961-5171

February 7, 1983

Mr. James H. Scarbrough
Residuals Management Branch
EPA - Region IV
345 Courtland St.
Atlanta, GA 30365

Dear Mr. Scarbrough:

As requested in your letter of February 23, please find attached the groundwater monitoring data from selected facilities in Mississippi. These data were selected at random from submissions attached to annual reports. Data from the following facilities is attached:

Koppers - Grenada
Amerada Hess - Purvis
Chevron - Pascagoula
Kerr-McGee - Hamilton
True Temper - Amory
Thiokol - Pascagoula
Kerr-McGee - Columbus

Please let us know if this is sufficient for your needs.

Sincerely,

David E. Lee

David E. Lee, P.E.
Division of Solid Waste Management

attachments

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET
ATLANTA, GEORGIA 30365

FEB 23 1983

RECEIVED 1983 FEB 25

AW-RM

Mr. Jack M. McMillan, Director
Division of Solid/Hazardous Waste
Management
Mississippi Department of Natural
Resources
P.O. Box 10385
Jackson, Mississippi 39209

Dear Mr. McMillan:

The enclosed memorandum from the Office of Solid Waste is asking for background groundwater quality data from interim status facilities with landfills, surface impoundments, or land treatment areas. The Agency is evaluating the statistical comparison procedure in Section 265.93(b) which facilities use to determine whether or not the groundwater quality is being affected. These statistical procedures are being evaluated to insure that facilities not be incorrectly forced to comply with §265.93(d)(2).

Because the Region IV States have all been authorized for Phase I, we do not have this data available in our office. However, as outlined on page 4 of John Skinner's memo, this information from authorized states will be beneficial to the Agency in conducting this evaluation.

I would appreciate copies of any groundwater data that you may have received from facilities in your State, for instance, data you may require on a quarterly basis, data received from facilities showing groundwater contamination, or from annual reports. We are not asking for any consolidation or compilation on your part, only copies of such data that could be used in the Environmental Protection Agency's (EPA's) evaluation.

If possible, we need this information by March 7, 1983. If you have any questions, please call Allan Antley at (404) 881-3016. Your cooperation is appreciated.

Sincerely yours,

James H. Scarbrough

James H. Scarbrough
Residuals Management Branch

Enclosure

WASHINGTON D.C. 20460

JAN 21 1983

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

MEMORANDUM

SUBJECT: Evaluation Study of Statistical Procedures for Ground-Water Monitoring under Part 265, Subpart F

FROM: John H. Skinner, Director
Office of Solid Waste

TO: Air and Waste Management Division Directors
Regions I-X

This memo announces and explains an evaluation study of the statistical procedures specified in the RCRA interim status ground-water monitoring requirements (Part 265, Subpart F). It also explains what information will be needed from the Regions in order to complete the study.

Background

Hazardous waste management facilities operating under interim status with landfills, surface impoundments, or land treatment areas have been required to collect extensive background water quality data from upgradient wells during the past year. The data include:

- The EPA Interim Primary Drinking Water Parameters [§265.92(b)(1)].
- Constituents that are generally accepted as characteristic of ground-water quality [§265.92(b)(2)]; and
- Four parameters that are useful as indicators of ground-water contamination [§265.92(b)(3)].

Although all three sets of data are sampled on a quarterly basis during the first year, the indicator parameters require a more extensive analysis on the part of the owner or operator. For the indicator parameters, four replicate measurements of each sample at each upgradient well are required at least quarterly for one year.

The Agency has specified a statistical comparison procedure [§265.93(b)] to determine if a facility may be affecting ground-water quality. This procedure is based on a statistical comparison between the indicator parameters measured in upgradient (background) wells during the first year and subsequently in downgradient monitoring wells. The statistical test specified is a Student's t-test at a 0.01 level of significance. A facility is determined to be affecting ground-water quality if any of the four indicator parameters is found to be significantly greater (greater or less for pH) in any downgradient monitoring well.

The statistical technique and the associated sampling protocol have been criticized for several reasons. Among the most persuasive is the comment that multiple comparisons of background versus monitoring data lead to a combined false positive probability that is unacceptably high. The Agency believes that the retesting of any parameters found to be significantly higher [§265.93(c)(2)] reduces the combined false positive probability to an acceptably low value. A contrary opinion asserts that seasonal trends dominate the variation of water quality to the extent that the retest procedure will not greatly reduce the combined false positive level. Because the combined false positive level represents the probability that a facility could be incorrectly forced to undertake an expensive assessment, the issue is extremely significant.

Evaluation Plan

It is imperative that the Agency evaluate the statistical procedure, in light of the issues discussed above, because facilities will shortly begin to use it to perform the required data comparisons. In addition, OMB included as part of their clearance (under the Paperwork Reduction Act) for the ground-water monitoring requirements, a condition that EPA perform an evaluation of the prescribed statistical procedure. As a result, we have developed and submitted to OMB an evaluation plan. The plan identifies four objectives:

- to demonstrate the range of applicability of the Student's t-test;
- to identify situations for which the t-test may be inappropriate;
- to estimate proportions of facilities for which the t-test will and will not apply; and
- to recommend alternative techniques for situations in which the t-test does not apply.

A copy of this evaluation plan is attached for your information.

Required Information

In order to perform this evaluation, the first year, upgradient indicator parameter well data are needed from as many facilities as is possible. These data should include the concentrations or values of the four indicator parameters for each upgradient well (identifying sampling dates) along with the calculated initial background means and variances established in accordance with §265.92(c)(2). More specifically, we need the four replicate measurements for each indicator parameter for each quarter. We do not need large reports at this time, although the availability of more detailed hydrologic information will be of interest in the future.

As you know, such data collected by facilities in calendar year 1982 are required to be submitted to EPA from facilities in unauthorized States by March 1, 1983 [§265.94(a)(2)(ii)]. We need data submissions from as many facilities as possible, as soon as possible. This is important because it will enable us to set up data handling and analytical procedures necessary to complete the evaluation in a timely fashion. There are four potential sources of early data:

- quarterly reports [§265.94(a)(2)(i)] submitted during the first year in which facilities volunteered indicator parameter data in addition to the required Interim Primary Drinking Water parameter data;
- data collected during calendar year 1981 and submitted as part of the annual report for 1981, due by January 10, 1983;
- data from authorized States that have more rigorous reporting requirements; and
- data submitted by facilities before the March 1, 1983 deadline.

We understand that since there is no standardized form for facilities to use to submit the data, the data submissions may be quite varied. As a result, I am asking that you identify a coordinator for this effort in your Region. This person should contact Burnell Vincent of my staff (382-4688) by February 11, 1983 to begin coordination efforts. Ultimately, each Region, in coordination with Mr. Vincent, will need to establish what data are available, their quality, and how much should be sent in to Headquarters.

Looking ahead, all agreed upon data submissions will need to be provided to us by March 15, 1983. The tight time frame is required to assure that results of at least a preliminary evaluation will be available by May 19, 1983, the latest date by which facilities can perform their first statistical comparisons in strict accordance with the compliance dates of Subpart F.

We are also asking for as much data as possible from authorized States for two reasons:

- We cannot be sure that enough data sets will be available for facilities in unauthorized States to ensure that the evaluation results will be meaningful, and
- The geographic distribution of the data would be skewed without data from more than just unauthorized States (e.g. almost all of the southern States are authorized).

While we realize that specific data or reporting requirements in some authorized States may differ from the Federal program, we ask that you coordinate with authorized States to obtain available data.

If you have any questions concerning this evaluation effort, please call Burnell Vincent (382-4688).

Attachment

RECORD OF TELEPHONE CONVERSATION

Name of firm or party: Koppers

Address: Grenada

Contact: Bill Baldwin

Phone: (412) 227-2368

Dan McLeod + I talked with Mr. Baldwin in October (approx. the 25th) concerning potential RCRA related activities related to burning creosote + penta in their boiler. This conversation was prompted by the Air Division's notice of intent to allow a temporary permit for the burning activity.

Mr. Baldwin informed us of the caloric value of the waste from the cylinders. Values are:

Creosote - 9465 BTU/lb
Penta - 7684 BTU/lb

These values are ~~over~~ over and near, respectively, the guidance of 8000 BTU/lb issued by Region ~~IV~~ IV. There should be no problem with considering this material as meeting the guidance values + exempting it from RCRA requirements, especially since the air Div. is placing limits on toxics to be measured.

Signature: David Lee

Date: 11/8/82

Koppers Company, Inc., Forest Products Group
P.O. Box 160, Tie Plant, MS 38960
Telephone 601-226-4584

Robert Lee

KOPPERS
Architectural and
Construction Materials

June 7, 1982

Ms. Dept. of Natural Resources
Bureau of Pollution Control
P. O. Box 10385
Jackson, Ms. 39209
ATTN: Mr. Robert A. Lee

Re: Interim Status Inspection
of April 20, 1982

Dear Mr. Lee:

At this time the freeboard of the surface impoundment is 35 inches or well within the required 24 inches.

The underground concrete tank that contained cooling water for a barometric condensor was closed from this use many years ago. Probing of this 18' deep tank indicates that if there was any bottom sludge, it was removed before the tank was converted to it's present service as a water reservoir for the fire protection system.

Sincerely,

R. C. Bartlow
Plant Manager

RCB/dm

cc: File

May 17, 1982

Mr. Ray Bartlow
Koppers Company, Inc.
Forrest Products Group
P. O. Box 160
Tie Plant, Mississippi 38960

Dear Mr. Bartlow:

Re: Interim Status Inspection
of April 20, 1982

An inspection of your facility was conducted on the above mentioned date. This inspection revealed that you have substantial compliance with the hazardous waste regulations. The only deficiency your facility had was the lack of adequate freeboard in your surface impoundment. According to your gage your facility had twenty inches (20") instead of the required twenty-four inches (24") of freeboard. The reason for this deficiency was the several inches of rain that your facility had received in the two or three days prior to the day of the inspection.

It is my suggestion, in order to avoid possible future regulatory action, that you close the old barometric condenser cooling water pond. You may dispose of the liquid and any sludge in this pond in the regulated surface impoundment. If you choose to follow this suggestion, please contact this office for approval of the closure plan prior to beginning closure.

If you have any questions, please call.

Very truly yours,

Robert A. Lee
Division of Solid Waste Management

RAL:cl

July 10, 1981

Mr. Thomas A. Marr, Supervisor
Environmental Engineering
Forest Products Group
Koppers Company, Inc.
Pittsburgh, PA 15219

Dear Mr. Marr:

On July 9, 1981, the Commission of the Department of Natural Resources adopted the federal regulations by reference to become the Mississippi Hazardous Waste Management Regulation. Therefore, pentachlorophenol has been removed from list 261.33(e) to list 261.33(f). The plastic wrappers in question are no longer considered hazardous waste and are not subject to the Mississippi Hazardous Waste Management Regulations at this time. However, these wrappers should be disposed of at a secure sanitary landfill.

If I can be of any further assistance to you, please do not hesitate in calling.

Sincerely,

Freddie A Roberts

Freddie A. Roberts, Sanitarian
Solid Waste Management Division

FAR/cs

Koppers Company, Inc., Forest Products Group
Pittsburgh, PA 15219, 412-227-2000

CERTIFIED MAIL

KOPPERS
Architectural and
Construction Materials

June 19, 1981

Mr. David Lee
Division of Solid Waste
Board of Health
P. O. Box 1700
Jackson, MS 39205

Dear Mr. Lee:

As a follow up to my discussion with Fred Roberts of your office, we are requesting that the State of Mississippi modify its hazardous waste laws to conform with changes in the federal regulations. Specifically the Federal EPA has removed pentachlorophenol from the acutely toxic list and placed it on the toxic list. This is referenced in 45 FR 78532 in which pentachlorophenol was transferred from the list of acutely hazardous wastes [Section 261.33 (E)] to the list of chemicals classified as toxic wastes [Section 261.33 (F)] if discarded. The old pentachlorophenol number was P090 and its new hazardous waste number is U242. The major difference is that since pentachlorophenol is listed as a toxic waste, the plastic wrapers used during shipment are not considered a hazardous waste.

We appreciate your efforts toward bringing the Mississippi State law into agreement with changes in the federal law. Please don't hesitate to call if there are any questions or comments.

Sincerely,

Thomas A. Marr

Thomas A. Marr
Supervisor
Environmental Engineering
Forest Products Group

TAM:cg
cc: R. C. Bartlow
Fred Roberts

Writer's Direct Dial Number (412) 227-2374

Koppers Company, Inc., Forest Products Group
P.O. Box 160, Tie Plant, MS 38960
Telephone 601-226-4584

KOPPERS
Architectural and
Construction Materials

July 2, 1981

Mississippi State Board of Health
P. O. Box 1700
Jackson, Ms. 38960

Dear Mr. Roberts:

The following deicrepancy has been corrected at this time: Section F; Subpart B--General Facility Standards-402.7-14(b).

Inspection log of lagoon to be placed in Hazardous Waste File.

Sincerely,

R. C. Bartlow
Plant Manager

RCB/dm

cc: File