

On January 16, 1976, Michigan Chemical Corporation submitted five documents relating to permit applications and a control program for hydrogen sulfide, all of which are applicable to Michigan Chemical at El Dorado. The documents are:

1. A letter outlining a proposed control program and schedule for controlling hydrogen sulfide emissions.
2. A permit application for controls to reduce bromine emissions from the existing bromine production area.
3. A permit application for added controls to reduce emissions from the existing brominated products area.
4. A permit application for a proposed expansion to produce brominated aromatic ether type products.
5. A permit application for a proposed bromine expansion. The proposed bromine expansion was first discussed with the staff in August, 1974, and is presently considered inactive. The controls, beyond the normal process controls, for this expansion are incorporated in the second listed document.

Except for the first identified document, all applications contain proprietary information as specifically identified by letter of January 21, 1976. Such information was necessary to evaluate the proposed air pollution control systems and constitutes an integral part of the applications. Items of secret or confidential nature include:

1. The raw materials used and the quantity processed per day or hour.
2. The production rates for products.
3. The block diagram flowsheets submitted as part of the applications to explain the processes.
4. The written process descriptions.
5. Drawings supplied to show the type and sizes of the various equipment used in the process, the arrangement of this equipment in the plant, and its intended function.

Michigan Chemical has requested that this information remain confidential.

Thus, this Minute Order is intended to serve, among other purposes, as an abstract of the applications described above. Mr. Art Sigel, Plant Manager of Michigan Chemical at El Dorado, has reviewed this Minute Order and has verified, in writing, (See Attachment II) that the contents of this Minute Order contains no information which has been requested by Michigan Chemical to be maintained by the Department as confidential information and, further, that the information contained herein accurately reflects the control devices and proposed emission rates as reflected in the application as submitted January 16, 1976.

COMMISSIONERS

[Handwritten signatures and initials]
REB JWS
CMB for JPS
N. L. [unclear] for Helwig

Billy Fraw
CHAIRMAN

SUBMITTED BY Jarrell E. Southall DATE PASSED 1/30/76

ARKANSAS DEPARTMENT OF
POLLUTION CONTROL AND ECOLOGY

MINUTE ORDER NO. 76-2

LOCATION - SUBJECT: Michigan Chemical

Corporation - Permit No. 319-A

PAGE 2 OF 3 PAGES

(Continued)

The first two mentioned applications represent proposed controls of existing processing facilities and were submitted pursuant to Minute Order 74-46 as was the letter outlining the hydrogen sulfide control program and schedules.

The hydrogen sulfide problem stems from release of sulfur laden gases at the well-site flares and at the stripper in the plant. Total sulfur emissions are 180 lbs/hr. Michigan Chemical has proposed a sulfur control program based upon the collection of gas streams from the wells and stripper, removal of the sulfur from these collected stream, and the eventual use of the desulfurized gases as boiler fuel. Michigan states in their letter of January 15, 1976, that engineering plans and acquisition of caustic and by-product sales are to be finalized May 1, 1976, at which time a permit application is to be submitted to this Department reflecting construction and operation details.

The approval by the Commission of the applications listed below is based on the understanding that such a control system as described above, or similar system, would be in operation prior to May 1, 1977. The Commission finds that flaring of the sulfur laden gases from the wells and stripper is not an approvable system since there would be no removal of sulfur prior to emission into the atmosphere.

Air pollution controls proposed for the existing bromine facility are designed to accomodate the proposed bromine expansion, which expansion would be accomplished by the installation of a fourth bromine extraction tower. Feed to the fourth tower would come from existing wells. The increased sulfur laden gases resulting from increased production at the existing wells will be treated within the same sulfur treatment system previously described above and which system is designed to control existing sulfur emissions.

Bromine from the extraction towers is condensed, purified and collected in storage tanks. Presently, emissions from the condensation process are carried to a scrubber prior to release to the atmosphere. Emissions from the purification process are vented to atmosphere via water cooled condensers. Presently, bromine emissions from products handling and storage are uncontrolled depressurization vents.

The applications received January 16, 1976, (dated January 15, 1976) propose installation of a manifolded collections system serving all process vents, tail brine vents and safety seal legs for the existing bromine facility including, similar emission points from the proposed fourth extraction tower. The manifolded emissions would be directed to a new, additional scrubber having an anticipated efficiency of 98%. This scrubber is identified as SN-138 in the summary of emission sources listed below.

COMMISSIONERS

[Handwritten signatures and initials]
BCE, Bay E
RCP, Jay S
A.P. for JPS
RAC for A.H.H.

A scrubber of 99% control efficiency is proposed to serve manifolded emissions from bromine storage tanks and to control emissions resulting from depressurization of tank and rail cars. This scrubber is identified in the summary as SN-139.

[Handwritten signature]
CHAIRMAN

SUBMITTED BY Jarrell E. Southall

DATE PASSED 1/30/76

(Continued)

An eductor is installed to control emissions during filling of tank cars. This unit is identified in the summary on SN-140.

A drum cleaning station is being installed; the resulting bromine vapors to be carried to a scrubber identified as SN-141.

The above mentioned sources will be the only permitted process vent emission points in the bromine production facility. Michigan Chemical anticipates an expenditure of \$400,000 for the controls described in the first two applications (existing and expanded bromine manufacturing facilities).

Item No. 3 is a permit application for additional air pollution control in the existing brominated products area. All process vents from the existing Tris products and TMCB areas are to be collected and manifolded to a scrubber with a 98% collection efficiency, which scrubber is identified as SN-241 in the summary of emissions listed below. The estimated cost of this project is to be \$38,600.

Item No. 4 is a permit application for a new facility to manufacture brominated aromatic ether products. The emissions from the reactor vessels are to be controlled by the use of four scrubbers (SN-419, SN-420, SN-421, and SN-422). Emissions from bromine transfers handling and storage will be controlled with a scrubber (SN-424) and by scrubber (SN-418).

Solvents from the reaction and product purification system are recovered in solvent recovery units. The recovery units and any of the associated tanks which might release solvents are piped through condensers to another scrubber (SN-423). The product drier, dry product handling system, bins, and bagger are all vented through a fabric filter (SN-425).

Sources No. 401 to 405, 407, 408, 410, 412 to 417 are storage tanks which are to have open or conservation vents. Tank No. 406 will be vented back to the tank truck while being filled and equipped with a nitrogen blanket. Tank No. 409 is to be vented to Tank No. 406. Source No. 411 is to be controlled with a scrubber.

The above mentioned sources will be the only permitted process vent emission points in the brominated aromatic ether facility. The estimated cost of air pollution controls for the brominated aromatic ether facility is to be \$373,000.

Michigan Chemical's investment for process equipment and facilities covered by the permit applications for the expanded bromine manufacture and the brominated aromatic ether facility is presently estimated at \$9,000,000.

COMMISSIONERS

[Handwritten signatures and initials]
JES
S.H.
B.G. by JES
R.C. by JES
C.P. for JPS
D.C. for JPS

The Commission, having considered the air pollution control measures proposed by Michigan Chemical as reflected in this Minute Order does hereby approve issuance of Permit No. 319-A to Michigan Chemical subject to (1) the conditions herein stated, (2) all general terms of the permit, (3) the installation and operation of a sulfur control system as described above, and (4) the operation of a monitoring program as specified below.

Within five months of commencement of operations of each permitted source listed in Attachment I, Michigan Chemical shall have collected at least five samples of the emissions of such source on at least five different calendar days. Michigan Chemical shall promptly take necessary corrective actions where emissions are found to exceed the predicted emission rates.

[Handwritten signature]
CHAIRMAN

SUBMITTED BY Jarrell E. Southall

DATE PASSED 1/30/76

Michigan Chemical Corporation

El Dorado Plant

Route 2, Box 162x
El Dorado, Arkansas 71730
(501) 862-1355

Arkansas Department of Pollution Control
and Ecology
8001 National Drive
Little Rock, Arkansas 72209

Gentlemen:

This letter will confirm that I have fully reviewed the minute order draft associated with Permit Number 319-A, which draft is to be submitted to the Commission at its meeting on January 30, 1976. The draft discloses no information which Michigan Chemical Corporation considers to be confidential and does accurately reflect the control devices and emission rates as submitted in our application of January 16, 1976.

Sincerely,



Arthur R. Sigel
Plant Manager

ANT	PREDICTED EMISSION RATE (lb/hr)
Acid	.003
Oxychloride	.004
Oxychloride	.002
	.023
	.01
	.01
	.01
cohol	.3
ine	.01
romide	.06
de	.01
	.01
	.03
	.01
	.02
	.02
cohol	.1
	.02
	.02
	.1

Attachment I, 319-A Continued

SOURCE DESCRIPTION	Source No.	CONTROL DEVICE	POLLUTANT	PREDICTED EMISSION RATE (lb/hr.)
Storage Tank	241	Scrubber	Hydrochloric Acid	.003
Storage Tank	241	Scrubber	Phosphorous Oxychloride	.004
Weight Tank	241	Scrubber	Phosphorous Oxychloride	.002
Weight Tank	241	Scrubber	Bromine	.023
		AROMATIC ETHER PROCESS - NEW SOURCE		
Storage Tank	401	Open Vent	Phenol	.01
Storage Tank	402	Open Vent	Phenol	.01
Storage Tank	403	Conservation Vent	Glycols	.01
Storage Tank	404	Conservation Vent	Aliphatic Alcohol	.3
Storage Tank	405	Open Vent	Tribromoethane	.01
Storage Tank	406	Conservation Vent	Ethylene Dibromide	.06
Storage Tank	407	Open Vent	Sulfur Dioxide	.01
Storage Tank	408	Open Vent	Phenol	.01
Storage Tank	410	Open Vent	Bromophenol	.03
Storage Tank	412	Open Vent	Phenol	.01
Storage Tank	413	Conservation Vent	Glycols	.02
Storage Tank	414	Conservation Vent	Glycols	.02
Storage Tank	415	Condenser	Aliphatic Alcohol	.1
Storage Tank	416	Conservation Vent	Glycols	.02
Storage Tank	417	Conservation Vent	Glycols	.02
Storage Tanks	418	Scrubber	Bromine	.1

Attachment I, 319-A

SOURCE DESCRIPTION	Source No.	CONTROL DEVICE	POLLUTANT	PREDICTED EMISSION RATE (lb/hr)
Process Vents	138	BROMINE MANUFACTURING - NEW SOURCE Condenser and Two Scrubbers	Bromine	1.0
Storage Tanks	139	Scrubber	Bromine	1.0
Shipping	140	Scrubber	Bromine	0.1
Process Vents	138	BROMINE MANUFACTURING - EXISTING SOURCE Condenser and 2 Scrubbers	Bromine	1.0
Bromine Storage Tanks and Receiving Operations	139	Scrubber	Bromine	1.0
Gauging Operation	140	Scrubber	Bromine	0.1
Drum Cleaning	141	Scrubber	Bromine	0.1
Storage Tank	241	BROMINATED PRODUCTS - EXISTING EQUIPMENT - TRIS - 2, 3, DIBROMOPROPYL PHOSPHATE PLANT Absorber Vent - Scrubber	Bromine	.02
Storage Tank	241	Scrubber	Allyl Alcohol	.01
Process Vent	241	2 Scrubbers	Dibromopropanol	.01
Process Vent	241	Condenser - Scrubber	Tris - 2,3, dibromopropyl phosphate	.01
Process Vent	241	Condenser - Scrubber	Tris - 2,3, dibromopropyl phosphate	.01
Process Vent	241	Condenser - Scrubber	Tris - 2,3, dibromopropyl phosphate	.01
Process Vent	241	2 Scrubbers	Hydrochloric Acid	.01

Attachment I, 319-A Continued

SOURCE DESCRIPTION	Source No.	CONTROL DEVICE	POLLUTANT	EMISSION RATE (lb/hr)	PREDICTED
Process Vents	419	Scrubber	Bromine	.01	
Process Vents	420	Scrubber	Sulfur Dioxide Bromine	.01	
Process Vents	421	Scrubber	Sulfur Dioxide Glycols	.5	
Process Vents	422	Scrubber	Ethylene Dibromide Phenols Tribromoethane	.04 Traces .01	
Process Vents	423	Condensers-Scrubber	Ethylene Dibromide Glycols Phenolics	.09 Traces Traces	
Bromine Recovery System	424	Scrubber	Glycols Ethylene Dibromide	.04 .07	
Process - Drier Packaging Storage	425	Fabric Filter	Bromine Brominated Aromatic Ether	1.0 1.0(Particulate)	