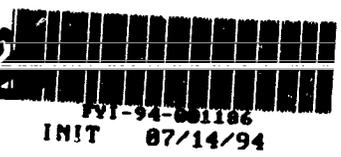


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741-0794-0218
Monsanto



MONSANTO CHEMICAL INTERMEDIATES CO.
800 N. Lindbergh Boulevard
St. Louis, Missouri 63166
Phone: (314) 894-1000



April 3, 1981

Enviro Control, Inc.
One Central Plaza
11300 Rockville Pike
Rockville, Maryland 20852

Attention: Dr. George Parris
Project Chemist

REF: (45 FR 66506, 10/7/80)

RECEIVED
94 JUL 14 AM 9:3

Dear Dr. Parris:

This letter is in response to correspondence from Mr. Greif to Monsanto Company plant managers as follows:

- January 26, 1981, to Mr. C. E. Heiserman, Pensacola, Florida
- February 4, 1981, to Mr. P. E. Brubaker, Texas City, Texas
- February 4, 1981, to Mr. R. F. Crone, Decatur, Alabama

Mr. Grief's letters requested information about certain Monsanto produced chemicals named below. This information is enclosed.

<u>Location</u>	<u>Chemical</u>	<u>CAS Reg. No.</u>	<u>Attachment</u>
Pensacola	Hexanedinitrile	111-69-3	1
Texas City	Triethylbenzene	25340-18-5	2
Texas City	Diethylbenzene	25340-17-4	2
Decatur	Hexanedinitrile	111-69-3 (not 13042-02-9)	1
Decatur	Propanenitrile	107-12-0	3
Decatur	1, 3, 6-Trihexane-tricarbonitrile	1772-25-4	4

In accord with phone verification from Mr. Greif's office, April 2, 1981, also enclosed is information about other Monsanto produced materials listed in the Federal Register (45 FR 66506, 10/7/80).

Dr. George Parris
Enviro Control, Inc.

-2-

April 3, 1981

<u>Location</u>	<u>Chemical</u>	<u>CAS Reg. No.</u>	<u>Attachment</u>
Texas City	Propanenitrile, 2-hydroxy-2-methyl	75-86-5	5
Alvin, Texas	4,7-methano-1H-Indene, 3A, 4, 7, 7A-Tetrahydro	77-73-6	6
Alvin, Texas	Benzene, bis (1-methylethyl)	25321-09-9	7

-Sincerely,


Harry M. Keating
Manager, Environmental Affairs

HMK:ku
Enclosures

cc: Mr. Martin Greif
Executive Secretary (TS-792)
TSCA Interagency Testing Committee

0004

CHEMICAL: Hexanedinitrile

CAS REG. NO.: 111-69-3

PRODUCING LOCATION: Decatur, Alabama

ANNUAL PRODUCTION: Lower half of TSCA Range 7 (100M to 500M pounds)

OCCUPATIONAL EXPOSURE: Persons potentially exposed - 120
Average human exposure - well below 0.5 ppm (8 hr. TWA)

ENVIRONMENTAL RELEASE: Airborne losses estimated <10 lbs/day. All aqueous losses undergo biotreatment in a site facility which discharges to the Tennessee River. Solid wastes minimal; landfilled per RCRA requirements.

ENVIRONMENTAL IMPACT: No known adverse environmental impact. Literature reference (Verschuere, Handbook of Environmental Data on Organic Chemicals) reports 100% removal in as few as 9 days in river water substrate.

PRODUCING LOCATION: Pensacola, Florida

ANNUAL PRODUCTION: Production discontinued indefinitely, 5/1/80.

ANNUAL CONSUMPTION: Lower half of TSCA Production Range 7.

OCCUPATIONAL EXPOSURE: Limited to potential exposures in the unloading of tank trucks; in its use as a chemical intermediate. in a closed system; and in laboratory analysis.
Persons potentially exposed - 12
Average human exposure - well below 0.5 ppm (8 hr. TWA)

ENVIRONMENTAL RELEASE: NIL

ENVIRONMENTAL IMPACT: See above.

CAS Reg. No.: 11-69-3

MONSANTO TOXICOLOGY PROGRAM STATUS

<u>Study</u>	<u>Status</u>	<u>Results</u>
<u>ACUTE</u>		
Oral, LD50, rats	Complete	2.5 mg/kg. Moderately toxic.
Dermal, LD50, rabbit.	Complete	>794 <1260 mg/kg. Moderately toxic.
Inhalation, LC50, 4-hour, rat.	Complete	2.9 mg/l. Moderately toxic.
Skin irritation, rabbit.	Complete	0.0/8.0. Non-irritating.
Eye irritation, rabbit.	Complete	10.6/110. Slight irritation.
<u>MUTAGENICITY POTENTIAL</u>		
Mammalian Cell Line Mouse Lymphoma Assay	In Progress	
<u>SUBCHRONIC EFFECTS</u>		
4-Week inhalation, rats, Study I	In life portion complete.	Rats of both sexes were exposed to 0.10, 0.26 and 0.95 mg/l of hexanedinitrile All animals exposed to 0.26 and 0.95 mg/l died by day 8. At 0.09 mg/l, over 70% of males died but all females survived.
4-week inhalation, rats, Study II	In life portion complete.	Rats of both sexes were exposed to levels of 0.013, 0.033 and 0.11 mg hexanedinitrile per liter. Only 11% of the males and 6% of the females died at the high dose level. No histological changes were observed.
90-day inhalation, rats.	Under consideration for 1981 or 1982 start.	

Chemical: Hexanedinitrile
CAS Reg. No.: 111-59-3

Attachment 1

MONSANTO TOXICOLOGY PROGRAM STATUS

<u>Study</u>	<u>Status</u>	<u>Results</u>
<u>TERATOLOGY</u>		
Teratology, gavage, rats.	Complete	Hexanedinitrile was administered to groups of 25 mated female rats at dosages of 30, 50 and 80 mg/kg on days 6 through 19 of gestation. No teratogenic effect at or below 80 mg/kg.
<u>REPRODUCTIVE EFFECTS</u>		
Reproduction study in rats.	Under consideration for 1982 start.	
<u>CHRONIC EFFECTS</u>		
Oncogenicity	No study planned because of the very low human and environmental exposures as a result of the production process and the limited use of the chemical as an intermediate.	

CHEMICAL: Triethylbenzene CAS REG. NO.: 25340-18-5
Diethylbenzene 25340-17-4

PRODUCING LOCATION: Texas City, Texas

ANNUAL PRODUCTION: Triethylbenzene, TSCA Range 5 (10M-50M pounds)
Diethylbenzene, TSCA Range 7 (100M-500M pounds)

OCCUPATIONAL EXPOSURE: Persons potentially exposed to triethylbenzene - 40 } Total 40
Persons potentially exposed to diethylbenzene - 40 }
Average human exposure - well below 0.5 ppm total
of both chemicals.

These chemicals are formed in the alkylation of benzene to ethylbenzene. They are recycled in a closed system to extinction in transalkalators. Hence potential exposure is minimal.

ENVIRONMENTAL RELEASE: Aqueous drainage from the ethylbenzene production area is skimmed by an API separator and recovered hydrocarbons are used as fuel. Neither diethylbenzene nor triethylbenzene is detected in the aqueous underflow to the biodegradation system.

- Process vents are fed to a continuous flare.
- Any heavy ends are transported by pipeline for use on site as fuel.

ENVIRONMENTAL IMPACT: NIL

**MONSANTO TOXICOLOGY
PROGRAM STATUS:**

No program has been initiated since the levels of exposure are so low versus the allowable exposure limits for similar chemicals and since the occupational physicians have found no adverse health effects which might be attributed to these compounds.

CHEMICAL: Propanenitrile

CAS REG. NO.: 107-12-0

PRODUCING LOCATION: Decatur, Alabama

ANNUAL PRODUCTION: Low end of TSCA Range 5 (10M - 50M pounds)

OCCUPATIONAL EXPOSURE: Persons potentially exposed - 120
Average human exposure - well below 0.5 ppm (8 hr. TWA)

ENVIRONMENTAL RELEASE: Airborne losses estimated <75 lbs/day.
Aqueous losses undergo biotreatment in a site facility which discharges to the Tennessee River.
This chemical is a by-product of the production of hexanedinitrile (CAS No. 111-69-3). It has a very limited market in which it is used as a chemical intermediate. The downstream occupational and environmental exposures are therefore expected to be very low. If production exceeds the limited market demand, unsold material is incinerated on-site.

ENVIRONMENTAL IMPACT: No known adverse environmental impact. Environmental reactions and degradation rate have not been determined but are estimated similar to hexanedinitrile (CAS No. 111-69-3).

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MCNSANTO TOXICOLOGY PROGRAM STATUS

<u>Study</u>	<u>Status</u>	<u>Results</u>
<u>ACUTE</u>		
Oral, LD50, rats	Complete	75 mg/kg. Moderately toxic.
Dermal, LD50, rabbit	Complete	>31.6 <50.1 mg/kg Class B poison.
Inhalation, LC50, 4-hour, rats	Complete	3.3 mg/l (male and female rats).
Eye irritation, rabbit	Complete	18.5/110. Slight irritation
Skin irritation, rabbit	Complete	1.1/8.0. Slight irritation.
<u>MUTAGENICITY</u>		
Microbial, Ames Test	Complete	Tested at concentrations up to 10,000 ug/plate both with and without microsomal activation No mutagenic response.
Mammalian Cell Line Mouse Lymphoma Assay	Under Consideration for 1981 program	
<u>SUBCHRONIC EFFECTS</u>		
4-week inhalation, rats	In life portion complete	Rats of both sexes were exposed to atmospheres containing 0.10, 0.16, and 0.75 mg/l at propanenitrile. 65% mortality in males and 5% mortalities in females was observed at the high dose level.
90-day inhalation, rats	Under consideration for 1982 start.	
<u>TERATOLOGY</u>		
Teratology, gavage, rats	Complete	Propanenitrile was administered by gavage to groups of 25 mated female rats at dosages of 20, 40 and 80 mg/kg on day 6 through 19 of gestation. No teratogenic effect at or below 80 mg/kg.

MONSANTO TOXICOLOGY PROGRAM STATUS

Study

Status

Results

REPRODUCTIVE EFFECTS

Under consideration
for 1982 start.

CHRONIC EFFECTS

Oncogenicity

No study planned because
of the very low human and
environmental exposures
as a result of the production
process and the limited use
of the chemical as an
intermediate.

CHEMICAL: 1, 3, 6-trihexanetricarbonitrile

CAS REG NO.: 1772-25-4

PRODUCING LOCATION: Decatur, Alabama

ANNUAL PRODUCTION: Low end of TSCA Range 5 (10M - 50M pounds)

OCCUPATIONAL EXPOSURE: Persons potentially exposed - 120
This high boiling compound is a non-commercial by-product contained within the production equipment and routed to on-site incineration without employee contact. From the monitoring of these same 120 people for hexanedinitrile (CAS No. 111-69-3), and propanenitrile (CAS No. 107-12-0), it can be concluded that exposure to 1, 3, 6-trihexanetricarbonitrile is well below 0.1 ppm (8 hr. TWA)

ENVIRONMENTAL RELEASE: Total production is incinerated on site with an estimated destruction efficiency >99%. Minimal aqueous losses are biotreated in a site facility which discharges to the Tennessee River.

ENVIRONMENTAL IMPACT: No known adverse environmental impact. Environmental reactions and degradation rate are anticipated to be similar to hexanedinitrile (CAS Reg. No. 111-69-3).

MONSANTO TOXICOLOGY PROGRAM STATUS: No testing has been started because exposures are essentially NIL and the occupational physicians have not observed adverse effects potentially attributable to presence of this chemical.

CHEMICAL: Propanenitrile, 2-hydroxy-2-methyl

CAS REG. NO.: 75-86-5

PRODUCING LOCATION: Texas City, Texas

ANNUAL PRODUCTION: Low end of TSCA Range 7 (100M - 500M pounds)

OCCUPATIONAL EXPOSURE: Persons potentially exposed - 40
Average human exposure - below 0.5 ppm (8 hr. TWA)

ENVIRONMENTAL RELEASE: All production unit equipment is installed so that any spilled material can be collected and reprocessed. No aqueous wastes leave the plant site. No significant loss to the atmosphere since all process vents are piped to a continuous flare.
Potential for environmental release and downstream personnel exposure is low since this chemical is used as an intermediate in the production of acrylate plastics.

ENVIRONMENTAL IMPACT: Under basic conditions, this chemical will dissociate to acetone and hydrogen cyanide. Acetone is biodegradable with a BOD₅ of 56% in fresh water. Monsanto ships this material to only one domestic customer via dedicated barges. Other shipments are made ex-USA.

CAS Reg. No.: 75-86-5

MONSANTO TOXICOLOGY PROGRAM STATUS

Study

Status

Results

ACUTE

No testing has been done since the acute effects have been anticipated to be similar to those of hydrogen cyanide.

SUBCHRONIC EFFECTS

4-week inhalation, rats.

Under consideration for 1981 start.

90-day inhalation, rats.

Under consideration for 1982 or later.

TERATOLOGY

Under consideration for 1982 or later.

REPRODUCTIVE EFFECTS

Under consideration for 1982 or later.

CHRONIC EFFECTS

Oncogenicity

No study planned because of the very low human exposure.

CHEMICAL: 4, 7-Methano-1H-Indene,
3A, 4, 7, 7A-Tetrahydro

CAS REG. NO.: 77-73-6

PRODUCTION LOCATION: Alvin, Texas

ANNUAL PRODUCTION: Low end of TSCA Range 5 (10M - 50M pounds)

OCCUPATIONAL EXPOSURE: Persons potentially exposed - 105
Average human exposure - below 1 ppm (8 hr. TWA);
short-term up to 5 ppm in tank car and barge loading.

ENVIRONMENTAL RELEASE: Airborne losses minimal since process vents are piped to
a continuous flare.
Small quantity in aqueous waste is effectively removed
by an API separator (organics used as fuel) prior to
biotreatment of the aqueous waste.

ENVIRONMENTAL IMPACT: No known adverse environmental impact.

0015

Chemical: 6,7-Dichloro-1H-Indene.

Attachment 6

CAS Reg. No.: 77-73-6

MONSANTO TOXICOLOGY PROGRAM STATUS

<u>Study</u>	<u>Status</u>	<u>Results</u>
<u>ACUTE</u>		
Inhalation, LC50, 40 hours, rat.	Complete	5.2 mg/l. Moderately toxic.
<u>SUBCHRONIC EFFECTS</u> <u>(JOINT STUDY)</u>		
90-day inhalation, rats and mice.	On-going	See attached 9/15/80 letter from Exxon Chemical Americas to the EPA administrator.

The course of future studies has not been determined pending completion and evaluation of the results of this on-going inhalation study.

0016

EXXON CHEMICAL AMERICAS

P. O. Box 3272, Houston, Texas 77001

ENVIRONMENTAL AFFAIRS DEPARTMENT
J. P. THORN
Manager

Attachment 6

EXXON
CHEMICALS

September 15, 1980

TSCA Section 8(e) Report
Dicyclopentadiene

The Honorable Douglas M. Costle
Administrator
Environmental Protection Agency
Washington, D. C. 20460

Dear Mr. Costle:

On behalf of Exxon Chemical Americas, division of Exxon Chemical Company, division of Exxon Corporation, this report is made in compliance with Section 8(e) of the Toxic Substances Control Act.

Dicyclopentadiene is a cyclic diolefin compound with a variety of uses as a chemical intermediate. Preliminary results in the first phase of a 90-day inhalation study of male and female rats and mice exposed to 50, 5, and 1 ppm produced some unexpected results in the male Fisher - 344 rats only. The observed functional and anatomical kidney changes in the animals studied to date are non-specific and are seen in this strain during the normal aging process and/or following a toxic insult. The current results were statistically significant and appeared after 10 days of exposure to 50 ppm. Additionally, the animals exposed to the ACGIH-TLV of 5 ppm demonstrated the same type of anatomic effect, although less severe.

A more detailed description of the study and the preliminary results observed is as follows:

A 90-day inhalation study of male and female rats and mice exposed to 50, 5 and 1 ppm dicyclopentadiene is underway. The protocol calls for interim sacrifices following 2, 6 and 13 weeks of exposure and at 4 and 13 weeks post-exposure. Nine animals per sex/group for each species are scheduled to be sacrificed at interim periods. Preliminary results from the first phase suggest the following in male Fisher - 344 rats only:

Male rats exposed to 50 ppm of dicyclopentadiene experienced statistically significant increases in water consumption and kidney weight, while urine specific gravity and osmolality were decreased. Urine from this group of animals contained increased numbers of epithelial cells and epithelial casts compared with urines from control animals. Renal tubules contained increased protein-filled droplets and histological changes suggestive of degeneration-regeneration. Some glomeruli from the animals showed increased size, endothelial cell swelling, intracapsular protein deposits and adhesions.

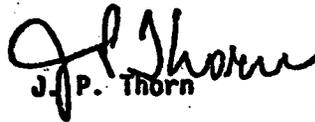
September 15, 1980

The group of animals exposed to 5 ppm dicyclopentadiene (the current ACGIH-TLV) showed statistically-significant increased numbers of epithelial cells and casts in the urine. Those exposed to 1 ppm showed some increased epithelial cells and casts in the urine. Proximal convoluted renal tubules from the 5 ppm group of rats showed increased numbers of protein-filled droplets as well as changes indicative of degeneration-regeneration.

As the study develops we expect more data on the dose-time-response of the animals to the 3 concentrations used as well as preliminary data on the question of reversibility of the renal effects.

We will advise you of further results upon completion of the study.

Very truly yours,


J.P. Thorn

JPT:skm

CHEMICAL: Benzene, bis(1-methylethyl)

CAS REG. NO.: 25321-09-9

PRODUCING LOCATION: Alvin, Texas

ANNUAL PRODUCTION: Low end of TSCA Range 5 (10M - 50M pounds)

OCCUPATIONAL EXPOSURE: Persons potentially exposed - 100
Average Human Exposure - Below 1 ppm (8 hr. TWA)

ENVIRONMENTAL RELEASE: Air emissions minimal since all vents are piped to a continuous flare.
A very minor component of an aqueous stream which is injected into a highly saline aquifer. None reaches surface waterways.
Since this material is sold as a gasoline blend stock, it is probable that it enters the environment from this source.

ENVIRONMENTAL IMPACT: No known adverse environmental impact.

MONSANTO TOXICOLOGY PROGRAM STATUS: Studies complete: None
Studies planned: None based on very low workplace exposures versus the allowable exposures for similar chemicals and since the occupational physicians have found no adverse health effects which might be attributed to this compound.