AUG 19 1970

Monsanto

FROM (NAME & LOCATION): W. B. PAPAGEORGE - ST. LOUIS

DATE: AUGUST 18, 1970

cc: H. S. BERGEN
J. MASON
J. E. SPRINGGATE

SUBJECT: PCB ENVIRONMENTAL PROBLEM
JULY STATUS REPORT

REFERENCE:

TO:
D. S. CAMERON - BRUSSELS
W. S. CLARK
J. R. DURLAND - TOKYO
M. W. FARRAR - 2ND STREET
E. V. JOHN
R. E. KELLER - 2ND STREET
R. M. KOUNTZ
D. A. OLSON
P. S. PARK
W. R. RICHARD
J. R. SAVAGE
E. P. WHEELER

MARKETING:

Market withdrawal programs continue on schedule. Therminol food users are converting to Therminol 66 or Therminol 55, with little loss of business.

Customer letters for notification of Pydraul F9A are prepared and will be issued when manufacture is complete (estimate 2 weeks).

The withdrawal/replacement program for Aroclor plasticizers appears to be going well. Several customers have reported success in reformulating in such applications as epoxy coating/potting systems and inks. Production orders for the products being withdrawn have been very heavy, however, the producing plants and production planning have done an excellent job of keeping shipments moving in an orderly fashion.

ENGINEERING:

Aroclor Incineration

A preliminary project scope for a 10 M pound/year liquid incineration system was developed and issued for review. A safety review was held. The project scope is being modified to reflect comments received. The appropriation request data transmittal will be issued in early August.

EXHIBIT
Plf. 595
8/14/92

TRAN 039104

IM 10 REV 11 65

ENGINEERING: (Continued)

MCS-1016 Distillation

Economic analyses to establish method and location for distilling 55 M pounds/year of MCS-1016 were completed and issued. The preliminary project scope was prepared and issued for comments. A safety review has just been held. The appropriation request data transmittal will be issued in early August.

EUROPE

There has been little new activity during July. Neither of the NERC reports has yet been published, although the new journal "Environmental Pollution" carried the paper written by the Monkswood people on the avian toxicity of PCB's. This provoked one or two reports in the popular press.

A NATO committee is sponsoring an investigation into marine pollution along the coast from Calais to the north of Holland, with special reference to PCB's. They were advised to get in touch with Bayer and Prodelec for information on the usage of PCB's in Belgium and within the whole of the EEC.

Implementation of the PCB plan for Europe is held up pending further meetings with the other PCB producers, firstly to determine their attitude towards a voluntary withdrawal from uncontrollable applications, and secondly to determine their reaction in the event of a unilateral withdrawal by Monsanto.

JAPAN

No new public developments in Japan. MMK writing revised policy for marketing of Aroclors. U.S.A. customers (3M, Thiokol) investigating Japanese sources.

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MEDICAL

Two year feeding studies continue. Twelve month status report is expected in August. Fish toxicity studies are being repeated as well as some of the chicken reproduction studies. FDA has issued guidelines establishing upper limits on PCB contents in milk at 0.2 ppm and other food at 5.0 ppm.

PUBLIC RELATIONS

A news release on Monsanto's recent actions to curb the use of PCB was distributed on July 16. It was primarily a rebuttal to recent stories that PCB caused birth defects, but included a complete background of voluntary actions taken to solve the PCB problem. Copies went to all news media who have carried PCB stories in the past two years.

Use of our story by the press has been light.

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RESEARCH

Aroclor 1242 Replacement for NCR

The two major problems with monoisopropyl biphenyl (MIPB) are now defined as odor and eye irritation. Both problems could be solved by changing from propylene to a higher olefin for alkylation of biphenyl. Major interest is now centered on $C_{6,8,10}$ alkyl biphenyl (ABP-11) from Ethyl Corp. α-olefin, our oxo process feedstock. Early testing by NCR was highly encouraging, however, print fade looms as a major problem. Back-up candidates include butyl, amyl, and hexyl biphenyl.

A series of six odor masks were provided NCR in an effort to improve the odor of MIPB without interfering with solvent performance.

Samples of extender and cosolvents were supplied to NCR to improve dye solubility and to give more rapid color development than NCR's current cosolvent. These materials are (1) heads fraction from alkyl benzene manufacture at Chocolate Bayou, (2) alkyl benzene (Alkylate 215), and (3) alkyl benzene high boiler (Alkylate H-230).

Plasticizer Replacements

Blends of Aroclors 5460, 5442 and 1221 were developed to approximately match the viscosities of Aroclors 1254, 1248 and 1242. Replacement recommendations were made to customers to whom viscosity is important. Specifications are being developed in cooperation with the Anniston Laboratory.

MCS-1016

Sixteen drums of the MCS-1016 have been prepared by fractionating Aroclor 1142 in a packed column equivalent to 25 trays in the Dayton Pilot Plant. The distillate was brought here and analyzed. Then the fractions were recombined to give the desired composition and treated with a Porocel column to give the desired electrical properties. The product is now ready for shipment to customers for testing in capacitors. Since all the electrical properties of MCS are indistinguishable from those of Aroclor 1242 and there are only minor differences in other properties, this fluid should be a direct substitute for Aroclor 1242 in the capacitor industry with no capacitor design change or processing changes needed.

TRAN 039107

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RESEARCH: (Continued)

Industrial Fluids

Pydraul F-9A

Pydraul F-9 was reformulated as Pydraul F-9A to avoid the use of chlorinated biphenyl. The new formulation is compatible with F-9. The lubricity in V105E pump tests is superior to any fluid we have ever run.

NC Phosphate Ester

Manufacturing costs are directly proportional to reaction times in the Step I reactor. We demonstrated that foaming in the Step I lab reactor and reaction time could be reduced by concurrent addition of $POCl_3$ and nonylphenol/cumylphenol. This should bring the reactor cycle to < 6 hours. The process pay-load might be further increased by employing the Schotten-Baumann Step II and III reactors.

The pilot plant is reworking 1000 pounds of plant material by acid hydrolysis and washing to reduce acidity and hydrolyzable material.

Aroclor Substitutes

Bromoaroclor 1233 (13% Br) was scaled-up in a 35 gallon run in the Pilot Plant. This fluid is being tested in hydraulic fluid applications as a more biodegradable replacement of chlorinated biphenyl.

Isomerization of chlorinated terphenyl 5032 results in a fluid with a 100°F viscosity of 2800 cs and a 210°F viscosity of 11.7. We are seeking the lowest viscosity, all liquid terphenyl for use in hydraulic fluids.

a-Methylstyrene dimer was mono and dichlorinated for evaluation as a plasticizer in place of chlorinated biphenyl.

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RESEARCH: (Continued)

Biodegradation - Ruabon

Priority has been given to the development of more refined GLC analytical techniques so that more selectivity will be available for degradation studies of multicomponent PCB's such as Aroclor 1242. This has caused some delay, but work in progress includes biodegradation studies of Pyralene 1500 (a competitive product), two of the key isomers for assessing the viability of the theoretical mechanism for degradation and HB-40. We are also studying the soil culture which Professor Evans, at Bangor University, has said will grow on Aroclors 1242 or 1254 as sole carbon source.

Biodegradation Testing - St. Louis

Testing of Aroclor 1242, Aroclor 1254, MCS-1016 (Aroclor 1242B), and Aroclor 1230B in our semi-continuous activated sludge units will be started as soon as sample background problems have been resolved. Identical conditions will be employed to permit a comparison between our present Aroclor product and the proposed substitutes.

MANUFACTURING

Anniston

Current Level

Aroclor losses during July averaged 3280 ppb in the plant effluent. This is equal to 36 pounds/day of Aroclor.

Plant Effluent Suspended Aroclor Control

Aroclor sump construction continues. Revision requesting an additional $4500 has been prepared. This was necessitated by unforeseen ground water problems. Completion by 9/1/70 still appears possible.

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MANUFACTURING: (Continued)

Bulk Waste Disposal

Data defining magnitude of solid material quantities will be completely collected by week of August 31. Quantities and the basic estimates from which they are derived will be discussed with Production and TSD representatives August 6.

Laboratory testing of mixtures of Montar 1 and Montar 5 were not dramatically successful in reducing pumping temperatures required - 200°C range still necessary.

Experiments with hydrocarbon dilution of chlorinated and unchlorinated Montars appear to indicate this as an extremely attractive route to effectively reduce pumping temperatures, in some cases to near ambient. Economic evaluations will be made in the next two months. If successful, this will reduce handling costs and also provide auxiliary fuel for incineration.

Sauget

PCB Levels in Sewer

Current losses are about 45 pounds/day to the river which is a concentration of 200-250 ppb.

Memo being published by M. Pierle covering the sampling program for the plant. The Aroclor Department and total plant effluent will be monitored daily. Current effort is to improve the sampling technique.

Aroclor analyzer received and laboratory is ready for routine analysis. Sampling will begin on a routine basis this week.

PCB Levels in Atmosphere

Points of loss have been determined. Report being published. Most severe losses are from Therminol units in Departments 239, 245, 248 and 255. Work begun to correct these areas.

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MANUFACTURING: (Continued)

Equipment has been purchased to take vapor samples. Where vapor is flowing, losses can be measured quantitatively. Where vapor flows cannot be measured such as in breather vents, qualitative results will be obtained. Will complete this as per schedule by September 1, 1970.

Projects To Reduce Sewered PCB's From Aroclor Department

Absorber rupture disk repiping (Est. 1512) complete.

Basin for trenches (Est. 1795) complete.

Blow tank demister (Est. 2031) project approved, long delivery items on order and project package will be issued by August 7, 1970.

Provide paving curbs and catch basin in Aroclor department to prevent losses from spills, especially in the tank car loading area. Guesstimate cost is $60,000 to $80,000. Estimate will be submitted by mid-August.

PCB Rework Project (Est. 2095)

Estimate completed, $32,000 capital, $3,000 expense. Appropriation request being typed.

Incineration Liaison

Phenol department fusion reactor area firmed up as location for Aroclor incineration. Tony Rasmussen named Manufacturing Representative.

W. B. PAPAGEORGE

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