BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	
Petition of Noveon, Inc.	)	
	)	**AS 02-5**
	)	
for an Adjusted Standard from	)	
35 Ill. Adm. Code 304.122	)	

NOTICE OF FILING

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PLEASE TAKE NOTICE that on **Friday, February 6, 2004**, we filed the attached **Written Testimony of David Giffin** with the Illinois Pollution Control Board, a copy of which is herewith served upon you.

Respectfully submitted,

NOVEON, INC.

By: _____
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THIS FILING IS SUBMITTED ON RECYCLED PAPER

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Written Testimony of David Giffin

My name is David Giffin. I reside at 336 County Road, 850 North, Sparland, Illinois (approximately 18 miles west of the Noveon Henry Plant). I am the HSE (Health Safety and Environmental) Manager for the Noveon Henry Plant. I graduated from the University of Illinois in 1967 with a Bachelor of Science degree in Zoology and a minor in Chemistry. In 1975 I received a Master's of Engineering Administration (MEA) degree from Bradley University.

Introduction

I have been employed at the Henry Plant for 34 years. I started as an Associate Engineer at the Henry Plant after being discharged from United States Army in July 1969. In this capacity I worked as a shift foreman for 13 months in the Polymer Chemicals' area. From 1970 to 1972, I worked as a Process Technical engineer in the Polymer Chemicals' area. I was then asked to be the Plant Environmental Engineer, a position I held from 1972 to 1978. In 1978, I transferred to the Geon production area as the General Foreman of Suspension and Dispersion production. In 1979, I became the Production Manager for Geon Suspension and Compound production. In 1982, I became the Technical Manager of Geon Suspension and Compounding. In 1983, I was asked to be the Plant Engineer of the facility. In 1992, I was asked to be the HSE Manager of the

facility and finally in March 1993, I assumed my current position as the HSE Manager for the Noveon plant. Through my work experience I have interfaced with all of the processes affected by the current NPDES Permit Appeal and Petition for an Adjusted Standard.

The Noveon Henry Plant

The Henry Plant site was established in 1958 by BFGoodrich as a chemical process facility manufacturing rubber chemicals for the rubber industry. This site was selected by BFGoodrich initially due to its unique location in proximity to the Illinois River, Rock Island railroad system, state highway system, electrical power resources, natural gas resources, water resources and positive work ethic of the local rural population. The property was purchased adjacent to land owned by Rohm and Haas.

Since 1958, the plant has expanded and changed so that two separate companies, Noveon, Inc. and PolyOne, now co-exist at the same site. PolyOne manufactures poly vinyl chloride products and was created as a separate entity in 1993 when BFGoodrich spun the Geon Vinyl division off and created a separate publicly traded company, the Geon Company. In 2001, Noveon, Inc. was created when BFGoodrich sold the remainder of its chemical operations to a private investment group.

The facility has a utility operation that serves both sides of the plant. The utility operation consists of a boiler operation, water treatment process and a complex wastewater treatment system that serves both companies on site. The boiler operation is owned and operated by Poly One while the water treatment and waste treatment systems are owned and operated by Noveon. In 1985, with the assistance of the State of Illinois, BFGoodrich constructed a state of the art circulating fluid bed coal fire boiler for $21

million that is capable of burning Illinois high sulfur coal environmentally clean. This boiler has been in operation for the past 17 years consuming high sulfur Illinois coal and supporting many jobs in the Illinois coal industry. The state of the art wastewater treatment system is owned and operated by Noveon, providing wastewater treatment for both company's wastewater processes.

Noveon Products

The Noveon facility currently produces antioxidants and accelerators for the rubber and plastics industry and employs 75 people. Recently, the facility has added Personal Care and Carboset products to its mix of products. The antioxidants and accelerators are the "salt and pepper" chemicals used in the production of rubber and plastics. In other words, the chemicals are used in small amounts to provide very key effects for the rubber and plastic industries. Without antioxidants present in such articles such as rubber bands, the rubber band as it expands and contracts will develop holes in the rubber and quickly break. This concept applies to tires as they support a vehicle and roll down the road; tires could not function safely without antioxidants. One of our products called Geltrol is even approved for food grade applications such as baby bottle nipples.

The accelerator products are used in the manufacture of specific rubber tires in such a way that the vulcanizing process does not require 8 or 10 hours but accelerates the curing action so that radial tires can be cured evenly in less than 30 minutes. In practical terms, this means that a tire that is going to cost less and last longer.

In light of the competitiveness of the rubber industry, the company more recently has been expanding its product base to include Personal Care products and Carboset

products that impact less competitive markets and have new product and better growth marketing potentials.

PolyOne

The PolyOne facility produces specialty polyvinyl chloride resins for niche, specialty markets and the flooring industry and has an employment of approximately 100 people. The resins produced by PolyOne have a myriad number of applications including the wear layer (top layer) of resilient floors, the support base of the resilient floor (bottom layer), protective coating of cans used for food processing and vinyl wallpaper.

Impact of Noveon and PolyOne on the Local Economy

Each of the companies play a major role in supporting the local economy through payment of wages, purchase of materials locally and the payment of real estate taxes (PolyOne = ~$128,000 and Noveon = ~$142,000). On an annual basis, each company supports a payroll including benefits of $8.2 million (PolyOne) and $6.2 million (Noveon). These payrolls provide the economic energy that helps support the community of Henry (population 2700) as well as local businesses within Marshall County and elsewhere. The average hourly rate for a chemical operator working at the site is approximately $23/hour. During a grant award ceremony for PolyOne as an aide to Robert Michael, U.S. Representative Ray LaHood said "This company is like the Caterpillar of Marshall County in the jobs it provides and the stability it provides the community." Typical economic models indicate that for every job created by Noveon's type of industry, six jobs are created as a result to support its overall production activities.

Overview of Wastewater Treatment Systems

The facilities' wastewater treatment system (refer to the attached drawing) serves both companies on site. It consists of wastewater storage tanks for each company that feed a primary treatment system consisting of pH control, flocculant addition and clarification. The clarified wastewater is then fed to a secondary treatment system consisting of an activated sludge system involving four separate biotreaters (totaling 2 million gallons) and then to a clarifier designed to remove and recycle the activated sludge back to the biotreaters. The clarified effluent is finally fed to a tertiary treatment system consisting of two traveling bed sandfilters. In addition to this system, non contact water from the water treatment system, boiler operations and storm water runoff are collected in separate ponds and are either fed back into the wastewater treatment system or to a Parkson sand filter, combined with the wastewater treatment effluent and discharged to the Illinois river through a single port discharge pipe.

The wastewater treatment system has undergone a number of improvements throughout the life of the facility. In 1972, the primary and secondary systems (800,000 gallon aeration pond) were installed. The secondary system was changed in 1987 and 1988 to above ground aeration tanks (1,000,000 gallons), and a sludge removal system was added. An initial tertiary sand filter system was installed in 1989. This tertiary filtering system was expanded to a second sand filter in 1992. Additional aeration (1,000,000 gallons) was added to the system in 1997 to provide more complete treatment of the wastewater organic load to the system. During the time period between 1990 and the present, many studies were conducted to evaluate methods for removing the ammonia nitrogen from the plant effluent.

The Noveon processes do not discharge any significant ammonia nitrogen directly to the wastewater treatment system. They do, however, discharge complex amine chemicals to the wastewater system including tertiary butyl amine and morpholine. These materials are discharged directly to the wastewater system due to the un-reacted portion of each chemical or indirectly due to loss of finished solid product to the wastewater system. The solid product can break back down into amine bearing byproducts. The PolyOne processes discharge a small amount of ammonia nitrogen directly to the wastewater system in the form of ammonium laurate, a dispersing agent used in their polymerization reaction step. Depending on the efficiency of the current activated biotreater system, the complex amines and amine bearing byproducts are converted to ammonia nitrogen and the ammonia from ammonium laurate are discharged to the Illinois River.

Source Reduction Efforts

Noveon through its Pollution Prevention efforts has evaluated all of its processes for contributing ammonia precursors to the wastewater treatment system. Through these evaluations the following source reduction activities have been pursued:

1. In 1990 a process evaluation/literature search for removing morpholine from the OBTS process was conducted by our R&D scientists. The technology identified for the removal of morpholine involves a liquid/liquid extraction system (refer to attached flow diagram). It begins with chlorinating the unreacted morpholine to n-chloromorpholine (NCM). NCM is then extracted from the water phase using an organic solvent such as toluene. The toluene/NCM is separated from the water using a decanting step and then

converted back to free morpholine and toluene using a reducing agent. Since the morpholine is soluble in water it can be separated from the toluene using a decanter and then recycled to the process as a raw material. The toluene is flashed in a flash pot and reused in the reactor for extracting additional NCM . Noveon did not proceed with this process because of safety, quality control, and other concerns with its implementation. These included the quality of the morpholine returning to the process, the unstable nature of NCM, which would present a risk of decomposition and explosion, and the hazardous waste generated from the process.

2. In 1990 a process evaluation/literature search for removing t-butylamine (tBA) from the BBTS process was conducted. This technology (see attached flow diagram) involves feeding the tBA waste stream to a steam stripping column. The tBA is condensed to a receiver and used back into the reactor. The water of the column is fed to the existing wastewater treatment system. The materials of construction for the column would need to be made from monel due to the high temperature and salt concentration.
3. In 1990 a process evaluation/literature search for removing morpholine from the Curite 18 process was conducted. This technology (see attached flow diagram) is very similar to the OBTS recovery process with the exception of the organic extractant (methylene chloride) and the need to reduce the NCM back to morpholine. The safety, quality control, and other concerns would remain the same as for the OBTS recovery system. Capital and operating costs would be similar.

4. In 1990 a process evaluation/literature search for removing morpholine, mercapto-benzothiazole, t-butyl amine and other by-products from the OBTS, MBDS, BBTS and Cure-rite 18 processes was conducted. This technology (see attached flow diagram) used acidification for pretreating all of the accelerator streams. The process involves collecting all of the streams and acidifying to a pH of 1, followed by neutralization to a pH of 7 and subsequent extraction of the organics using an organic solvent such as isopropanol in an liquid/liquid extractor. The solvent/organic waste stream is then fed to a flash pot where the solvent is stripped off and the organic tars are collected for disposal. The solvent is re-purified and re-used. In this treatment scenario none of the organic tars would be suited for re-use in the process. Significant R&D would be needed to develop this treatment further. Safety, environmental, and other concerns with this pretreatment involve the potential generation of carbon disulfide (auto-ignition at 200 degrees F), amount of hazardous waste generated, and the high levels of total dissolved solids (TDS) to the waste treatment system.
5. In 1994 the MBDS process was started up at the Henry Plant. Since it also uses morpholine as a raw material, a process evaluation/literature search for removing morpholine from MBDS process was conducted. Due to the similarity of this process and the OBTS process it was determined that the same literature search and evaluation of potential treatments would be applicable for the morpholine as for the OBTS process. See the above description and cost for the OBTS.

6. In 1996, Noveon spent more than $742,000 to install a new BHS filter system improving significantly the dewatering of the BBTS and Curite 18 streams and reducing loss of solids to the waste treatment system. The BHS system technology relies on a series of plates covered with a filter cloth media that are located on the outer circumference of a rotating steel hub. Each plate goes through a fill step (filtration), two wash steps, an air blow step, and a cake discharge step. Prior to returning to a fill step, it goes through a cloth cleaning step. Due to the nature of the technology, solids removal is very efficient and very dependent upon the nature of the cloth collecting the product. As a result of this improvement, the process efficiency increased by 47 lbs/charge and reduced the amount of BBTS to the wastewater treatment system by 100,000 pounds in 1997.

7. Based on summer work in 2000 and 2001, performed by several of Noveon's P2 Intern students (Rebecca Forbeck and Adam Lock) under Illinois EPA's Pollution Prevention program, Noveon optimized the filtration media of its BHS Rotary Filter media. With this improvement, better capture of the accelerator product occurred as it was processed through the filtration operation, reducing 66,000 pounds of product (BBTS) to the waste treatment system. In addition to this work, efforts were conducted to improve loss of product from the BBTS fines scrubber used to prevent particulate emissions to the air from the Fluid Bed Dryer. Through Noveon engineering efforts and also some later work done by the 2002 P2 Intern student, Crystal Johnson, fines loss to the wastewater treatment system was reduced further using a

polymer coagulant that improved the collection and processing of fines back to the BHS Rotary filter, reducing by 123,000 pounds the amount of BBTS fines to the wastewater treatment system. Noveon was recognized for this effort by the IEPA/IWMRC with the 15th Annual 2002 Governor's Award for Pollution Prevention.

8. Finally, in 2003 Noveon engineers optimized the t-Butyl Amine (tBA) recovery system by linking the vacuum control valve of the recovery system to the measured heat load on the tBA recovery condenser. As a result of providing greater vacuum control, tBA recovery was improved by 5% and reduced losses to the wastewater treatment system by 185,000 pounds. Noveon was recognized for this effort with the 17th Annual Governor's P2 Award.

As already mentioned, the above activities represent "source reduction" activities investigated or completed by the plant to reduce ammonia precursors to the waste treatment system. As most environmental engineers recognize, the best starting point to solve a waste issue is through "source reduction". Noveon has made extensive efforts to reduce the ammonia in the wastewater and expended a great deal of money and time to reduce solids and liquid losses to the waste treatment system.

Other Wastewater Ammonia Reduction Efforts

In light of the IEPA's "treatment" criteria, the plant conducted a number of in-house activities to determine whether there were appropriate end of pipe options for reducing ammonia discharge from its waste treatment facility. A more complete evaluation of these activities will be provided by our consultant, Houston Flippin of

Brown and Caldwell. However, I would like to discuss several of the assessments that were completed on line with the current waste treatment system.

In 1997, the Noveon plant conducted a pretreatment experiment for several months of the PC waste stream. The pretreatment involved lowering the pH of this stream using FeCl3 and the precipitation and removal of solids prior to neutralizing the stream and feeding the effluent back to the rest of the wastewater treatment system (primary, secondary and tertiary treatment). Noveon incurred a monthly cost of approximately $40,000 to evaluate the effects of solids removal at a lower pH. The effluent showed a 25% COD reduction along with a reduction in mercapto-benzothiazole (~50%). In spite of this treatment, the system did not show any evidence of nitrification in the biotreaters. The above experiment involved renting equipment including tanks, a plate and frame press, flocculators, and providing contract labor to run the system 24 hours a day.

During the summer of 2000, the Noveon plant conducted full scale aeration studies of air stripping for various effluents through the modification of the East Biotreater that had been taken out of normal biological service and converted to a temporary air stripper using its normal air diffusion system and floating aerators and by the installation of a floating aerator in the Noveon waste tank. These modifications were estimated to cost ~$50,000. The following trials were conducted:

1. Aeration of the primary clarifier effluent- Results: aeration was unable to reduce ammonia nitrogen below 110 mg/l. Also we were not able to control the pH to the desired level due to the method of caustic addition. A 10 hp and a 100 hp surface aerator were evaluated.

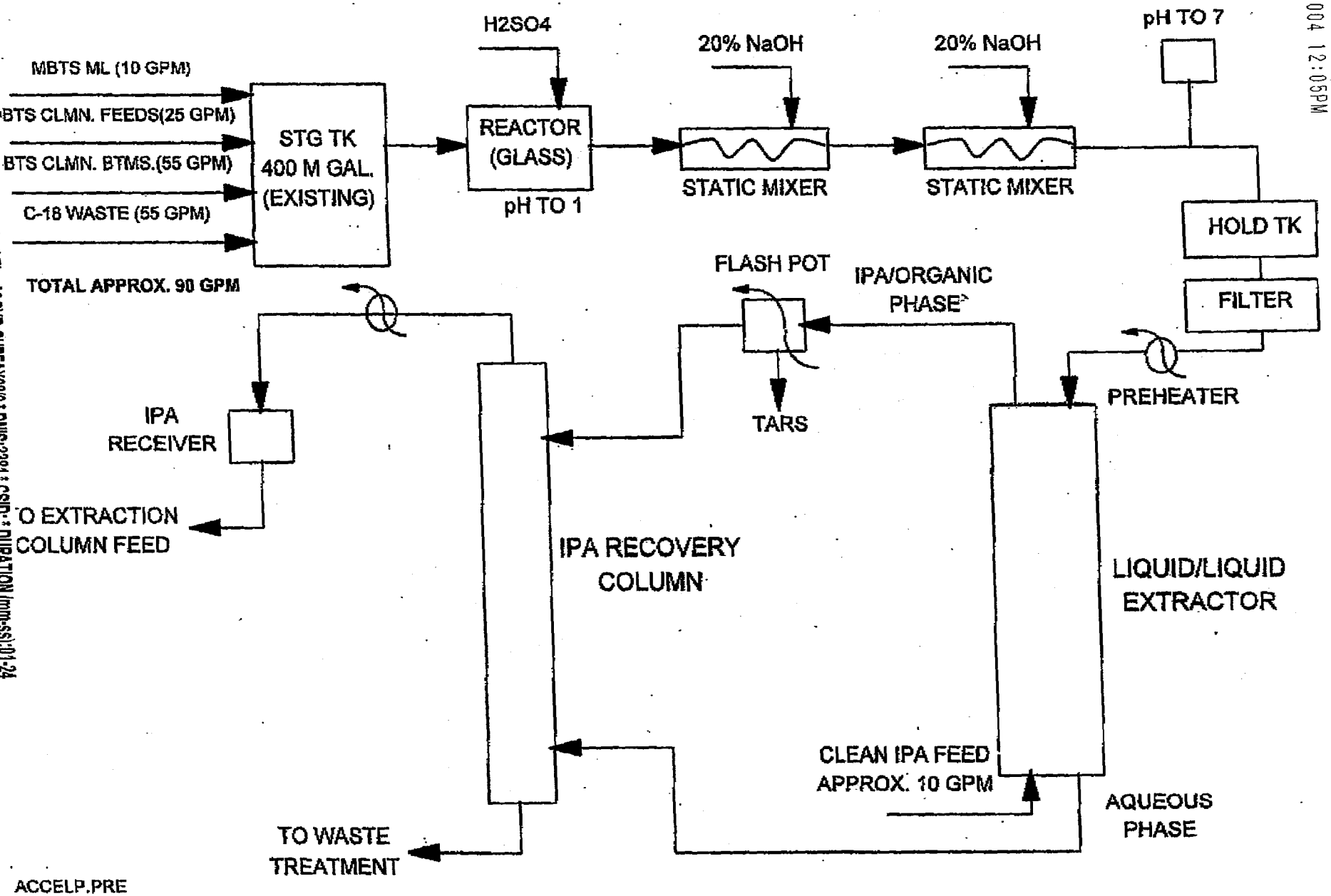
2. Aeration of Noveon waste stream only (PC Tank): A 100 hp surface aerator was installed in the PC Tank and the tank influent and effluent was characterized for TKN removal, morpholine removal and tBA removal. The outcome was that TKN was reduced during the trial as was the tBA; however, there was no morpholine removal. All of these experiments had many variables that could not be controlled due to the evaluation being conducted on a full production sized system.

The above trials were stopped due to the difficulty of controlling pH and also due to production demands. The testimony of Houston Flippin will more fully address the potential of air stripping ammonia from the Noveon waste water.

Conclusion

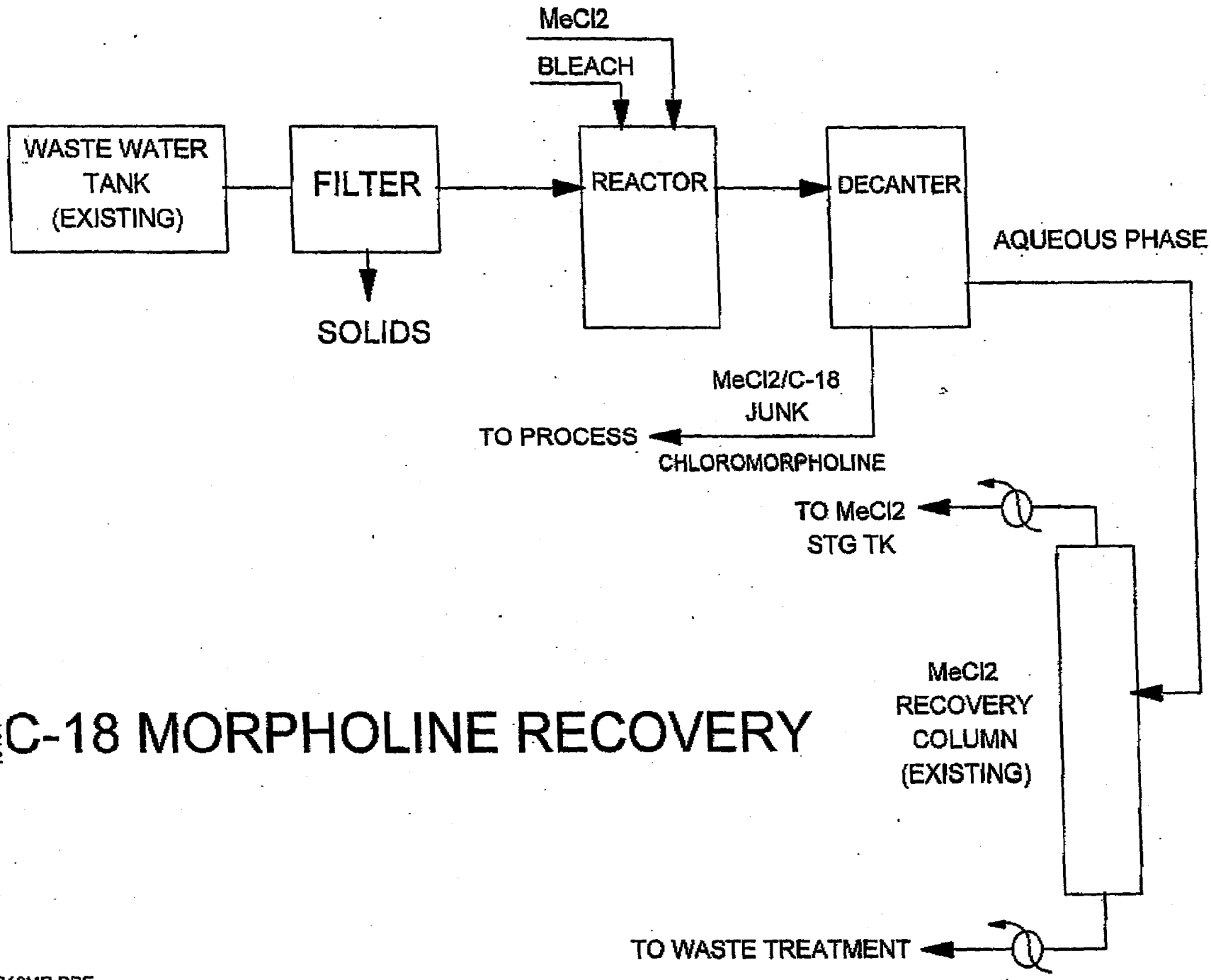
In light of all of the above "source reduction" and "end-of-pipe" activities conducted by the plant, the plant has determined that there is no silver bullet that will allow its wastewater treatment system to comply with the 3 mg/l and 6 mg/l ammonia standard that the Illinois EPA is attempting to impose by application of 35 Il. Adm. Code § 304.122. Due to the ubiquitous nature of the ammonia precursors located throughout the facility, no single pre-treatment lends a final feasible solution. The various treatments studied in 1990 are extremely expensive to install and operate, and in many cases would result in environmental impacts of far more concern than the facility's current discharge.

ACCELERATOR PRETREATMENT

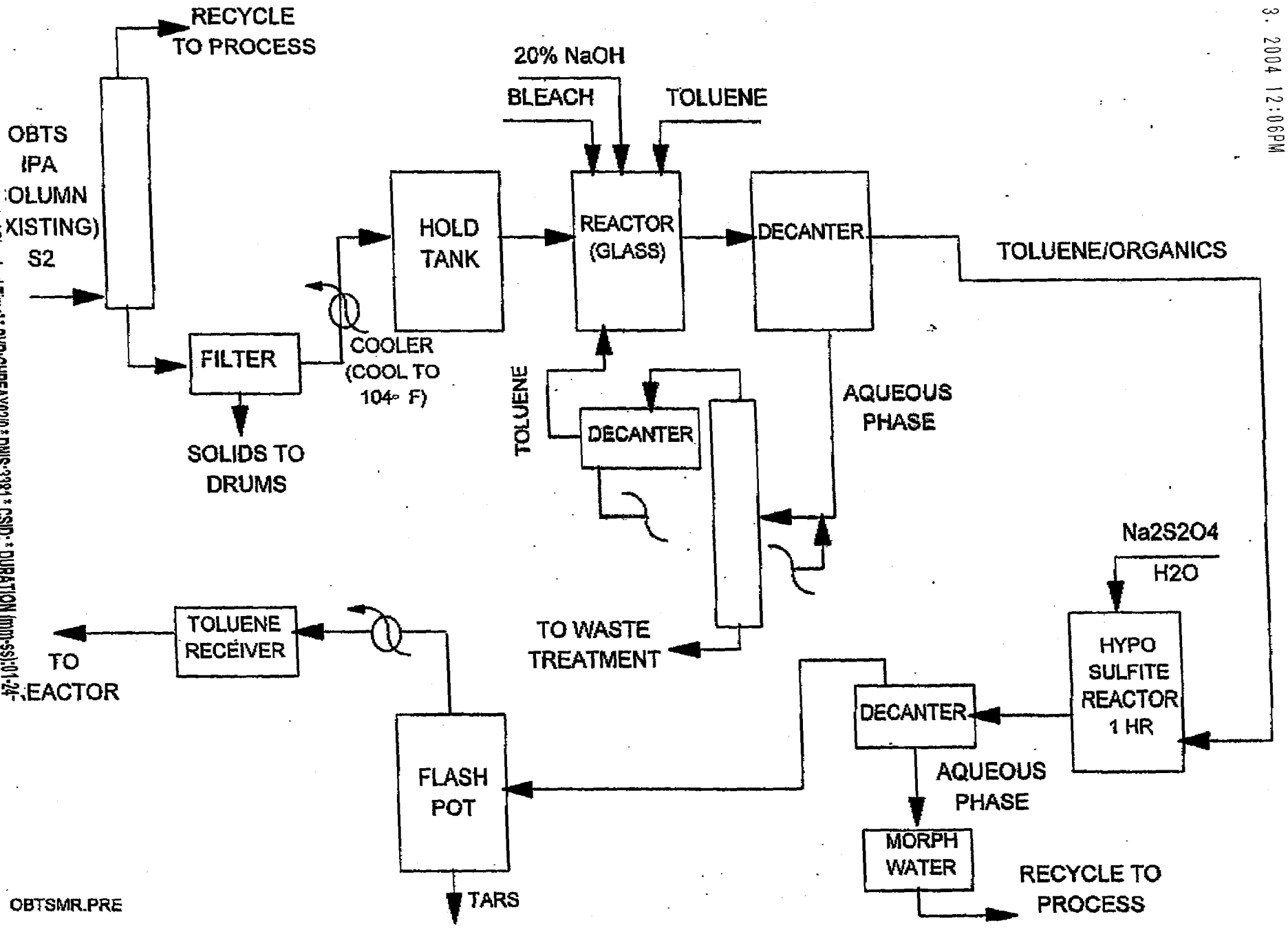


ACCELP.PRE

C-18 MORPHOLINE RECOVERY

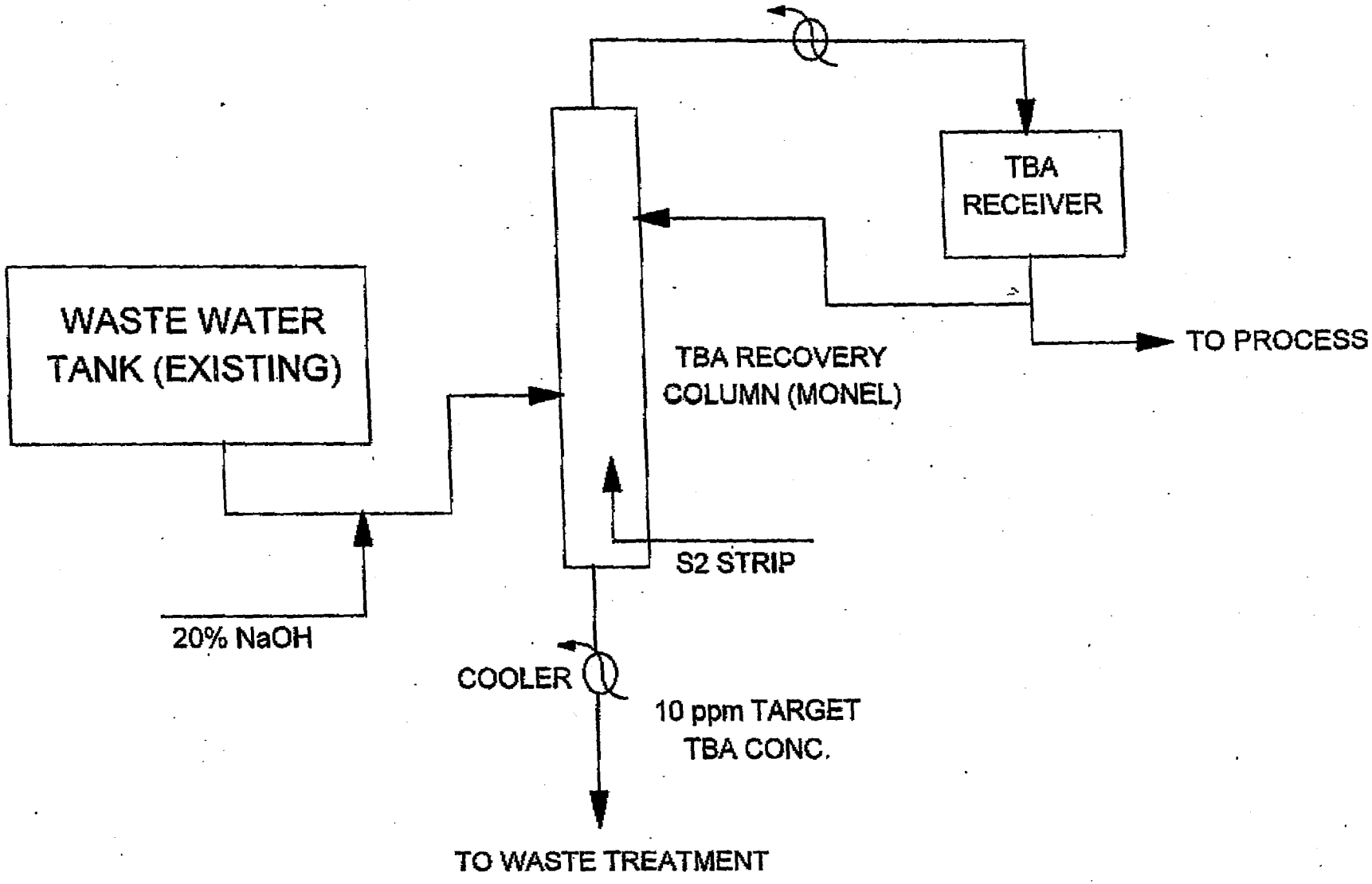


OBTS MORPHOLINE RECOVERY



OBTSMR.PRE

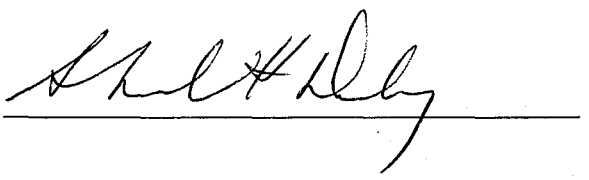
TBA RECOVERY



TBAR.PRE

CERTIFICATE OF SERVICE

The undersigned certifies that a copy of the foregoing **Notice of Filing** and **Written Testimony of David Giffin** was filed by hand delivery with the Clerk of the Illinois Pollution Control Board and served upon the parties to whom said Notice is directed by first class mail, postage prepaid, by depositing in the U.S. Mail at 191 N. Wacker Drive, Chicago, Illinois on Friday, February 6, 2004 and facsimile.



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