EASTMAN

Eastman Chemical Company
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CERTIFIED

October 29, 1996

Regulatory Reinvention Pilot Projects
FRL-5197-9, Water Docket, Mail Code 4101
U.S. Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460

Subject: Eastman Chemical Company Project XL Application

Gentlemen/Ladies:

Enclosed is an application to participate in the U.S. Environmental Protection Agency (EPA)'s Project XL. The application summarizes a project proposal for Eastman Chemical Company's Tennessee Eastman Division, located in Kingsport, Tennessee.

Tennessee Eastman's XL proposal is for regulatory relief to be provided from current and future regulations that drive Tennessee Eastman toward costly compliance options (related to management of biosludge) with negative environmental benefit in exchange for a project not currently required by regulations that would yield optimal benefits to project stakeholders at reasonable costs.

Eastman believes this proposal offers potential for substantial benefits to all the stakeholders and that the environmental benefits will be both substantial and readily apparent. The proposal outlines the background and reasoning for the proposal and proposes basic concepts for the beginnings of a Final Project Agreement. However, we understand that the details of such an agreement will be developed in a Stakeholder process. We have discussed this proposal with our Community Advisory Panel and our state regulatory agency and have been encouraged from these discussions that our proposal has merit.

Eastman is very interested in cost-effective alternative compliance concepts that achieve superior environmental results. If you have any questions concerning this application, please contact Mr. Stephen R. Gossett of our Environmental Affairs staff at (423) 229-2327.

Sincerely,

Harry H. Holliman

Mr. Harry H. Holliman
President, Tennessee Eastman Division
Eastman Chemical Company

cc: Bill Patton (EPA Region 4), Wayne Scharber (Tennessee Department of Environment and Conservation), Eileen McGovern (EPA Project XL), Jon Kessler (EPA Project XL)

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Eastman Chemical Company

# Facility Based XL Project

## Project Proposal

## Eastman Chemical Company
## Tennessee Eastman Division
## Kingsport, Tennessee

## Outline

# Facility Based XL Project

# Project Proposal

# Eastman Chemical Company
# Tennessee Eastman Division
# Kingsport, Tennessee

## I. Executive Summary

Tennessee Eastman Division (Tennessee Eastman) is a major manufacturing site of Eastman Chemical Company located in Kingsport, Tennessee. Tennessee Eastman's waste management program strives for maximum reduction of waste volume and toxicity through appropriate treatment of wastes in on-site centralized waste treatment facilities. A key component of Tennessee Eastman's integrated waste management program is the practice of treating wastes, both RCRA hazardous and non-hazardous, in eight coal-fired industrial boilers.

This practice is currently subject to regulations promulgated under RCRA known as the Boiler and Industrial Furnace (BIF) rules (40 CFR 266 Subpart H). Pursuant to the Administrator's Combustion Initiative and the requirements to promulgate Maximum Achievable Control Technology (MACT) standards for all sources of hazardous air pollutants (HAPs) (section 112(d) of the Clean Air Act), EPA is developing additional regulations that address burning of hazardous wastes in industrial boilers. Additionally, in an effort to meet requirements of sections 112(d) and 129(a)(1)(D) of the Clean Air Act, EPA is investigating a coordinated regulatory development of MACT standards for all industrial-commercial-institutional combustion sources not burning hazardous wastes. Finally, section 112(f) of the Clean Air Act requires residual risk remaining after implementation of MACT standards to be addressed within eight years of promulgation of the MACT standards.

All of these current and future regulatory programs affect Tennessee Eastman's ability to cost-effectively continue the practice of treatment of wastes in industrial boilers. Tennessee Eastman believes our current practice is protective of human health and the environment. Options that Tennessee Eastman has under consideration to deal with these programs may result in minimal benefits to the environment or even result in net increases in emissions to the environment.

Tennessee Eastman believes it could execute an environmentally beneficial project not currently required by regulation that would yield far better benefits to the environment and to stakeholders for less cost than other options under consideration to comply with current and future regulations affecting Tennessee Eastman's practice of treating wastes in industrial boilers.

**Tennessee Eastman's XL proposal is for regulatory relief to be provided from current and future regulations that drive Tennessee Eastman toward costly compliance options with negative environmental benefit in exchange for a project not currently required by regulations that would yield optimal benefits to project stakeholders at reasonable costs.**

# II. Project Background Information

## A. Eastman Chemical Company

Eastman Chemical Company (Eastman), headquartered in Kingsport, Tennessee, is a major manufacturer of chemicals, fibers, and plastics. Eastman has major domestic manufacturing sites in Kingsport, Tennessee; Longview, Texas; Columbia, South Carolina; and Batesville, Arkansas. Eastman was a division of Eastman Kodak until January of 1994, when it was spun-off as a separate entity.

Eastman employs about 17,500 employees worldwide and is committed to quality in all aspects of its business. In 1993, Eastman was awarded the Malcolm Baldridge National Quality Award in the large manufacturing category - the only chemical company that has received this award. Eastman is also committed to the Chemical Manufacturers Association's Responsible Care® program which is a public commitment to continuous improvement in health, safety, and environmental performance.

## B. Tennessee Eastman Division

General

Eastman's oldest and largest manufacturing site is Tennessee Eastman Division (Tennessee Eastman) located in Kingsport, Tennessee. Tennessee Eastman was established in 1920 when Eastman Kodak purchased a government owned wood distillation plant for production of methanol for use in their photographic film base. Tennessee Eastman now employs about 8,000 people and accounts for about 50 percent of Eastman's sales. The developed plant site covers about 1,000 acres and includes over 450 buildings. Tennessee Eastman manufactures over 300 industrial chemicals, one basic fiber, and three basic types of plastics. Figure 1 presents a block flow diagram showing the relationship of Tennessee Eastman's manufacturing processes, steam/power generation, and waste management systems.

Steam/Power Generation Facilities

Most of Tennessee Eastman's steam and electrical power demands are met by an integrated system of 21 coal-fired and three gas-fired industrial boilers. Tennessee Eastman burns approximately 54 carloads of coal per day from Southwest Virginia and Eastern Kentucky coal mines. The coal-fired boilers are in three different powerhouses. The Building 83 Powerhouse contains Boilers 11 - 24. These boilers all burn stoker coal and are equipped with electro-static precipitators (ESPs). As will be discussed below, Boilers 18 - 24 also burn a biosludge waste stream. In addition, Boilers 23 and 24 burn liquid waste streams from manufacturing processes. The Building 253 Powerhouse contains five pulverized coal boilers. Each of these is equipped with new ESPs installed in 1991 - 1993. The Building 325 Powerhouse contains two pulverized coal boilers 30 and 31. Boiler 30 has an ESP and Boiler 31 has a fabric filter. Both have flue-gas desulfurization systems. Boiler 30 is permitted and equipped to burn liquid waste streams from manufacturing processes.

Waste Management Systems

Tennessee Eastman has long operated with the policy first to minimize wastes through recycle, reuse, or byproduct sale and then to treat/dispose of all waste materials on-site. Only relatively small quantities of certain materials are sent off-site for reclamation or treatment/disposal. As a result, Tennessee Eastman operates large on-site waste

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management units. Combustible solid wastes and part of the combustible liquid wastes are treated in Tennessee Eastman's RCRA permitted Building 248 Incineration Facility comprised of two rotary kilns and one liquid destructor, all served by high energy venturi wet scrubbing air pollution control systems. The balance of the combustible liquid wastes are burned in Tennessee Eastman's coal-fired Boilers 23, 24, and 30, all of which are operating under Interim Status in compliance with the 40 CFR 266 Boiler and Industrial Furnace (BIF) regulations.

Wastewaters generated by Tennessee Eastman's manufacturing processes are collected, aggregated, and transported via pipeline to Tennessee Eastman's industrial wastewater treatment facility (IWWTF). Scrubber water blowdown from the Building 248 Incinerators is also aggregated with the main wastewater flow and comprises about 1 - 2 percent of the total flow.

The IWWTF is an activated sludge biological treatment process which uses biological solids (microorganisms) to degrade and remove pollutants. The original activated sludge process included diversion, aeration, flocculation/clarification, sludge dewatering, and post aeration unit processes. In 1988, a new tank-based system was installed to replace the diversion and aeration steps that were taking place in surface impoundments. This new system also includes neutralization, equalization, and grit-removal unit processes prior to the aeration step. The grit-removal unit process settles and removes coarse particles (primarily plastic pellets and cellulose acetate) from the wastewater stream so that the coarse-bubble aeration system will not become clogged with the particles.

Operation of Tennessee Eastman's activated sludge process requires that biological solids be settled and removed via clarifiers using polymer flocculants prior to discharge of the effluent. A portion of the solids removed by the clarifiers must be "wasted" from the system while the balance is recycled as return activated sludge to the aeration process. Removal of the waste solids is accomplished via belt filter presses which dewater the solids from 2 - 3 percent solids to 12 - 15 percent solids. This material, referred to as "biosludge", contains the cells of microorganisms including the water inside the cells and trace contaminants which are adsorbed on the cell walls as well as relatively small quantities of the "grit" described above which is mixed with the biological solids just downstream of the belt filters. The biosludge does not exhibit any characteristic of a hazardous waste (ignitability, corrosivity, reactivity, or toxicity) as defined in 40 CFR 261 Subpart C nor is it listed as a hazardous waste under 40 CFR 261 Subpart D.

In the late 1970s, Tennessee Eastman selected treatment of the biosludge in its coal-fired stoker fed boilers as the most economical and environmentally protective option for sludge management. The biosludge is collected from belt filters in trailers, transported to the Building 83 Powerhouse, where it is managed in tanks and pumped through a header system to Boilers 18 - 24. The header system distributes the biosludge into steam assisted annular burner nozzles which spray atomize the biosludge directly into the combustion zone of the boilers.

Bottom ash cinders from these boilers are sold as an ingredient for cinder block. Flyash collected by the electrostatic precipitators (ESPs) on each of the boilers' exit gas discharges is disposed at an on-site Subtitle D nonhazardous waste landfill. Since these residues are generated primarily from the combustion of coal and meet the requirements of 40 CFR 266.112, they are exempt from regulation as hazardous waste.

## C. Regulatory Programs Impacting Tennessee Eastman's Practice of Burning Waste in Coal-Fired Industrial Boilers

### Resource Conservation and Recovery Act (RCRA)

#### Mixture and Derived-from Rules

Even though neither the influent to the IWWTF nor the biosludge exhibit a characteristic of a hazardous waste or are listed as a hazardous waste, Tennessee Eastman agreed in a Consent Agreement and Final Order with EPA Region IV in 1986 to permit its IWWTF under the RCRA regulations. EPA acknowledged in the Order that Tennessee Eastman's agreement to the Order does not constitute an admission that the IWWTF was subject to RCRA prior to the Order. Since that time, Tennessee Eastman has been managing the influent wastewater to its IWWTF and the resulting biosludge generated by the IWWTF as RCRA hazardous wastes. Tennessee Eastman understands that EPA's rationale for permitting the IWWTF under RCRA was application of RCRA's mixture and derived-from rules (40 CFR 261.3(a)(2)(iv) and 40 CFR 261.3(c)(2), respectively) to the mixture of scrubber blowdown from the RCRA permitted incinerators and other on-site process wastewaters. Subsequently, in 1988 Tennessee Eastman received a RCRA Part B permit from the State of Tennessee for its IWWTF surface impoundments and is operating in compliance with that permit.

By virtue of the Consent Agreement and Final Order, Tennessee Eastman's boilers treating biosludge (derived from the treatment of the influent wastewater) are subject to RCRA interim status standards.

#### Boiler and Industrial Furnace Regulations

In 1991, EPA promulgated its regulations for hazardous waste burned in boilers and industrial furnaces otherwise known as the "BIF" rules (40 CFR 266 Subpart H). Included in those regulations are standards for operation under interim status and permit standards. These rules impose significant new standards including standards to control organic emissions, standards to control particulate matter, standards to control metals emissions, standards to control hydrogen chloride and chlorine gas emissions and regulation of residues. Additionally, compliance testing is required under interim status along with initial certifications of compliance and periodic recertifications (every three years).

Tennessee Eastman has completed all required Certification of Compliance (COC) tests and has demonstrated it is meeting all interim status standards. However, the manner in which the BIF rules address the metals emissions standards has resulted in a biosludge burning capacity decrease. As will be discussed in more detail in Section D below, this capacity decrease is attributed to the normal variation in metals concentrations in the coal supply, rather than the characteristics of the biosludge.

Significant costs are associated with compliance with these regulations, primarily for compliance testing, sampling and analytical programs for coal, waste streams, and residues, and premium prices and delivery rates for coal.

**Part B Permitting**

The State of Tennessee has stated its intent to call for Tennessee Eastman's RCRA Part B permit application for its BIF units. This application, along with the subsequent trial burns and permit issuance will subject the boilers to destruction and removal efficiency (DRE) testing in addition to all of the interim status standards described above. Also, the State could impose other onerous requirements under RCRA's omnibus authority (RCRA Section 3005(c)(3)) including such requirements as multipathway risk assessments and additional monitoring and recordkeeping requirements. The Part B permitting process is a resource intensive endeavor for both the owner/operator and the regulatory agencies.

**Pending Joint RCRA BIF/CAA MACT Standards**

EPA is currently working toward a 1999 deadline to promulgate new standards related to BIFs burning hazardous waste. These standards, while not yet proposed, could be patterned after a similar rulemaking proposed on April 19, 1996 for hazardous waste combustors (incinerators, cement kilns, and lightweight aggregate kilns) which includes technology-based lowered particulate standards, metals emission standards, and dioxin/furan emission standards along with increased performance testing requirements.

**Clean Air Act**

**MACT Standards**

Section 112(d) of the Clean Air Act requires EPA to establish maximum achievable control technology (MACT) standards for sources of hazardous air pollutants (HAPs). MACT is defined as being no less stringent than the average emission limitation achieved by the best performing 12 percent of the existing sources in a source category or subcategory, otherwise know as the MACT floor. MACT can be established above the MACT floor by taking into consideration the cost of achieving such emission reduction and any non-air quality health and environmental impacts and energy requirements.

EPA has recently announced its consideration of an Industrial Combustion Strategy to jointly promulgate MACT standards for all industrial, commercial, and institutional combustion. The statutory deadline for issuance of these standards is November, 2000. If standards are not promulgated by May, 2002, then sources must establish MACT on a case-by-case basis under section 112(j) of the Clean Air Act. This MACT standard would reportedly exclude sources subject to RCRA standards. Additionally, the Industrial Combustion Strategy also would reportedly address the requirement in Section 129(a)(1)(D) for EPA to establish performance standards for solid waste incineration units. There is uncertainty as to how industrial boilers that burn some quantities of solid waste along with the primary fossil fuel would be categorized (i.e. would they be subject to MACT standards for industrial boilers under Section 112(d) or standards for solid waste incineration units under Section 129).

**Residual Risk**

Section 112(f) of the Clean Air Act provides statutory authority to address the risk from HAPs remaining after MACT controls are implemented. It requires EPA to report to Congress by 1996 on methods for calculating risk to public health remaining after MACT controls are implemented, the public health significance of such remaining risk,

actual health effects with respect to persons living in the vicinity of sources, and recommendations as to legislation regarding such remaining risk. If Congress takes no action on any such recommendations, EPA is required to promulgate residual risk standards within 8 years of promulgation of the relevant MACT standard.

## D. BIF Regulations Are Having an Unwarranted Impact on Emissions from Burning Coal

Tennessee Eastman's chief concern with the current and future BIF rules is that the emissions from burning coal are brought into the RCRA regulatory program simply because RCRA materials are co-managed in Boilers 18 - 24 and 30. Eastman believes these emissions should be addressed on a level playing field with all other industrial and utility coal-fired boilers. The Clean Air Act Title III MACT and Residual Risk programs are designed to achieve this goal. Eastman notes the quantities of coal burned in its boilers that co-manage hazardous waste constitute a small portion of the coal received from the exact same coal sources at major utilities in the region. The emissions from burning coal in all of the industrial and utility sources should be regulated uniformly to avoid any inequities.

The manner in which the BIF rules limit the emissions of the carcinogenic metals is posing a significant problem for Tennessee Eastman. Data from the Certification of Compliance (COC) test reports on Tennessee Eastman's BIF units demonstrate that the vast majority of the risk to the maximum exposed individual (MEI) from the carcinogenic metals (arsenic, beryllium, cadmium, and hexavalent chromium) can be attributed to the emissions from burning coal. In fact, using EPA's unit risk factors and average metals concentrations obtained from an extensive sampling program on Tennessee Eastman's coal and biosludge, Eastman estimates that about 87 percent of the calculated risk attributed to the carcinogenic metals is from coal and 98 percent of the risk attributed to coal is from arsenic. (Eastman notes that the total calculated risk estimated in this analysis does not exceed the 40 CFR Part 266 standards for the carincogenic metals.) Tennessee Eastman has conducted an extensive (over 500 samples) sampling program on the coal it receives from Southwest Virginia and Eastern Kentucky coal mines and has found the arsenic concentrations to be highly variable. The standard deviation is 73 percent of the mean and the maximum observed value is 4.4 times the mean. Finally, the COC tests have also shown the electrostatic precipitators to be highly efficient in removal of metals from the combustion gas.

Eastman believes the following factors have led to an overly conservative regulatory approach to controlling metals emissions from its BIFs:

1. The inhalation unit risk factor for arsenic from the IRIS database used in the BIF rules is 4.3 E-03 per ug/$m^3$. A study of the utility industry emissions published by the Electric Power Research Institute in 1994 (Electric Utility Trace Substances Synthesis Report) uses a value less than one-third of this value (1.4 E-03). The technical basis for this difference is found in a paper published in Regulatory Toxicology and Pharmacology in 1994 (Viren, John R. and Abraham Silvers, "Unit Risk Estimates for Airborne Arsenic Exposure: An Updated View Based on Recent Data from Two Copper Smelter Cohorts", Regulatory Toxicology and Pharmacology 20, 125 - 138 (1994)).

2. The MEI assumptions themselves are very conservative. It is unknown at this time what protocols will be recommended for use in the 112(f) residual risk program. There

is a possibility that, as the scientific community progresses in its understanding of risk assessment, some other protocol may ultimately be recommended.

3. BIF rules require that metals feedrates be monitored continuously on a hourly rolling average basis. This creates an overly conservative system where each shipment of coal must be representatively sampled and the results of that analysis entered into the metals feedrate calculation so that hour-by-hour, the MEI risk levels are not exceeded. The MEI risk by definition for carcinogenic constituents is based on a 70 year exposure period. To focus on the hourly emissions rather than a long term average is unreasonable and is contrary to traditional approaches under the Clean Air Act that establish averaging times consistent with the health based standard. The net result of such an approach is that the source, depending on how narrow its margin of compliance is to the allowed risk, must screen and selectively purchase coal that is within a tight specification. A 52 week rolling average would solve much of the problem imposed by the BIF metals emissions standards and still be very protective of human health and the environment.

## E. Current Opportunities for Regulatory Relief

### Delisting

40 CFR 260.20 and 40 CFR 260.22 provide EPA the regulatory authority known as "delisting" to exclude specific waste streams from RCRA classification. EPA's traditional delisting program has utilized very conservative criteria and generally has not allowed site-specific circumstances of waste management to be considered. These factors have prevented Tennessee Eastman from submitting a delisting petition for the biosludge even though it is a low risk waste.

### Hazardous Waste Identification Rule (HWIR)

On December 21, 1995, EPA proposed its HWIR, a rule that would provide exit levels for hazardous wastes. This rule is based on conservative risk models and offers some hope for consideration of contingent management. However, it includes impractical continuing compliance demonstrations where compliance is defined at the method detection limit. Based on the proposed rule, Tennessee Eastman's biosludge would not meet the exit levels for a very few constituents. The effective date of a final HWIR rule is unknown and the timing of an eventual rule may not help to solve problems Tennessee Eastman faces with application of the RCRA rules to its practice of burning biosludge in coal-fired boilers.

## Regulatory Pressures Are Causing Eastman to Strongly Consider High Cost/Benefit Ratio Options

The combination of the conservative current BIF rules and the perceived tightened BIF/MACT rules attributed to the association of waste treatment with emissions from power generation is causing Eastman management to strongly consider one of the following options:

1. New Incineration Complex
   Discontinue all treatment of wastes in boilers and replace this lost capacity with a new greenfield incineration complex specifically designed for biosludge and liquid waste treatment. This option would cost in excess of $100 M and net emissions to the environment would actually increase. The emissions from burning coal for steam and power generation in Boilers 18 - 24 and 30 would continue in order to meet Tennessee Eastman's manufacturing demands. The new incineration complex would introduce new emissions of NOx of approximately 400 tons per year that would not otherwise be present because of the fuel requirements to combust the sludge. In addition, as discussed below, the cessation of burning the wet biosludge in the boilers will result in increased emissions from these boilers.

2. Sludge Drying/Burn Biosludge in One or Two Boilers at a Time
   Sludge dryers could be installed to dry the biosludge from 12 - 15 percent solids to 90 percent solids and allow the biosludge to be handled as a dry material. These dryers would concentrate the biosludge and allow the biosludge to be treated in one or two boilers instead of seven. This would allow Tennessee Eastman to eliminate the emissions from five or six boilers no longer burning hazardous waste from the MEI metals feedrate calculations. The problem with this option is that it is capital intensive and has high annual operating costs. However, it provides Tennessee Eastman with much flexibility and assurance of being able to meet existing and future BIF regulations. If future BIF/MACT rules were to require air pollution control system upgrades, Tennessee Eastman could make these costly upgrades of one or two boilers rather than seven.

   Eastman is fully permitted to burn only coal in these boilers or to operate in the mode of co-firing biosludge with the coal. From an environmental benefit standpoint, no emission reduction would be realized from the installation of the sludge dryers since the five or six boilers no longer burning biosludge would continue to operate to meet the plant's steam and electric power demands. However, stack test and continuous emission monitor data indicate that the current practice of co-burning coal and the wet biosludge actually results in a decrease of particulate emissions of approximately 75 tons per year and a decrease of approximately 760 tons per year of nitrogen oxide (NOx) emissions. The decrease in particulate emissions is attributed to increased particulate removal efficiency of the electro-static precipitators caused by the introduction of moisture inherent to the biosludge into the system. The decrease in NOx emissions is attributed to the flame quenching effect of the moisture in the biosludge which acts to suppress the formation of thermally generated NOx in the combustion zone. Thus, the burning of biosludge in these coal-fired boilers is having the net effect of reducing emissions when compared to the alternative mode of operation of using the boilers solely to burn coal for steam production. Additionally, the sludge dryers would actually require an increase in steam production with resulting emissions from burning more coal to generate the steam to power the sludge dryers.

3. Sludge Dryers/Landfill

Similarly to Option 2, Tennessee Eastman could install sludge dryers and landfill the dried biosludge. The dried biosludge would meet the Land Disposal Restrictions. The drawbacks of this option are the same as Option 2. Additionally, a hazardous waste landfill would have to be permitted and built. Although this option would be lower cost than Options 1 or 2, it is not a preferred option and would be in conflict with Eastman's policy to minimize land disposal of wastes.

## III. XL Proposal

Consistent with the Project XL concept, Eastman believes that there are projects it could do that would accomplish far more environmental benefit for less cost than the current options under consideration to comply with current and future regulatory requirements that address Tennessee Eastman's practice of treating wastes in industrial coal-fired boilers.

### Regulatory Relief

Eastman's current vision of an XL project would include the following components to provide regulatory relief:

1. A site-specific delisting of the biosludge under the existing regulatory authority of 40 CFR 260.22. Delisting authority has recently been delegated to the Regions. A site-specific delisting would include negotiated safeguards that would ensure the regulatory authority that the biosludge is safely managed as a non-hazardous waste and provide delisting criteria with which Tennessee Eastman can demonstrate compliance without unnecessarily restricting its flexibility to accept changes to its manufacturing processes. This delisting would exempt consideration of the biosludge as a hazardous waste in existing and future RCRA BIF rules and CAA MACT standards for BIFs burning hazardous waste.

2. Agreement that operation of any boilers burning hazardous wastes would comply with interim status or Part B permit standards by either:

   (a) discounting emissions attributed to coal, or
   (b) allowing long term average values of metals concentration in coal rather than hourly rolling averages and using an inhalation unit risk factor for arsenic of 1.4 E-03 ug/$m^3$ as recommended by the utility industry study referenced above.

3. Agreement that Tennessee Eastman would proceed with the State of Tennessee to obtain a RCRA Part B permit for Boilers 23, 24, and 30 and maintain interim status for Boilers 18 - 22. Interim status would be maintained to preserve a safety net for both the regulatory authority and Eastman in the event unforeseen circumstances dictate that these boilers must be used once again for hazardous waste treatment. It is vitally important that a manufacturing facility the size of Tennessee Eastman maintain the regulatory status that permits on-site treatment of wastes. In the event these boilers were needed for hazardous waste treatment, Tennessee Eastman would comply with the applicable requirements of 40 CFR Part 270.

4. Agreement that Tennessee Eastman's boilers burning nonhazardous waste (i.e. delisted biosludge) would be categorized as industrial boilers under section 112(d) of the Clean Air Act rather than as solid waste incineration units under section 129(g) of the Clean Air Act. Such categorization would alleviate uncertainty as to the nature of future standard setting and ensure that emissions from burning coal are treated equitably with coal emissions from coal-fired boilers that do not co-fire waste streams.

In exchange for this regulatory relief, Eastman proposes to develop an emission reduction program for a major segment of its manufacturing operation at the Tennessee Eastman site. The details of this program would be developed during the XL stakeholder process, however, the following conceptual information is provided in order for Eastman's XL proposal to be evaluated:

**Emissions Reduction Program at Organic Chemicals Batch Manufacturing Facility**

Eastman operates a large organic chemicals batch manufacturing facility at the Tennessee Eastman site. More than 150 different products are produced in any given year in this facility. Unit operations include reactions, crystallization, distillation, drying, centrifugation, and vacuum filtration. The batch processes include use of organic solvents (e.g. acetone, heptane, isopropyl alcohol, methanol, toluene, xylene). The batch manufacturing processes are served by solvent recovery processes that recover a portion of the reusable solvent. Wastewater effluent from the facility is treated on-site in Tennessee Eastman's industrial wastewater treatment system. Liquid and solid wastes and/or byproducts are either incinerated on-site in Tennessee Eastman's hazardous waste incineration complex, burned for energy recovery in on-site coal-fired industrial boilers, or sent to off-site reclamation or treatment facilities. Most of the air emissions are collected and controlled via condensation and/or absorbers.

Air permits for most of the manufacturing equipment in this complex are consolidated into one facility-wide permit with facility-wide caps established for gaseous air pollutants. Additional permits are in place for adjacent dedicated manufacturing, the solvent recovery facilities, and the tank farm that serve the manufacturing processes. The consolidation was done in preparation for the Title V Operating Permit Program and will greatly simplify the permitting process as well as provide maximum operating flexibility and a less complicated compliance verification system for the entire facility, The primary air pollutants permitted are volatile organic compounds (VOCs) comprised of the solvents listed above.

Because Kingsport is an ozone attainment area, the VOC emissions from this facility are not subject to Reasonably Available Control Technology (RACT) standards. The batch processes are not subject to New Source Performance Standards (NSPS). Because some of the processes do involve the use of Hazardous Air Pollutants (HAPs) as solvents, relevant portions of the facility will likely be subject to Maximum Achievable Control Technology (MACT) standards. HAP reductions may or may not be required at the facility depending on where the MACT floor is established for relevant source categories. The statutory deadline for promulgation of these standards is not until November 15, 2000. However, the Clean Air Act (CAA) allows EPA to miss the deadline by as much as 18 months before MACT standards are established case-by-case pursuant to section 112(j). Once MACT standards are promulgated, the CAA allows up to three years to comply with the standards. In summary, the batch manufacturing facility is not currently subject to mandates that will require emission reductions and future regulations that could impose reductions from parts of the facility are not likely to be effective until May, 2005.

Due to the nature of the current emissions from the facility and the absence of regulatory mandates applicable to the facility, Eastman has identified the batch manufacturing facility as a good candidate for voluntary emission reductions. Eastman believes that through a combination of pollution prevention projects, installation of new more efficient production equipment, decommissioning of older less efficient production equipment, and improved air pollution control equipment, that it can make significant emission reductions within the context of an XL project. Eastman projects the capital costs of these improvements to be quite high. Part of these costs can be offset with operating cost savings, however, these types of projects do not normally have effective rates of return of capital investments when compared to other business opportunities.

These projects would further the goals of the CAA and yield environmental benefits in terms of reductions in emissions of VOCs and HAPs. In addition, based on input Eastman has received from the local community, associated odor reductions that would result from this proposed emission reduction program would be perceived as a valuable benefit to the community. Odor reduction has been identified by Eastman's Community Advisory Panel as a high priority for environmental improvement. For these reasons, Eastman believes these projects can be justified within an XL project that provides the regulatory relief requested above (for burning of wastes in boilers) and prevents Eastman from making large expenditures to comply with otherwise applicable regulatory programs which, in Eastman's case, will result in negative environmental benefits.

To establish the significance of the potential superior environmental benefits offered by this XL proposal, Tennessee Eastman believes it can achieve an estimated actual organic compound emission reduction of 600,000 pounds per year, assuming that all aspects of the regulatory relief requested above is granted. Considering that the Clean Air Act establishes the threshold for a significant net emissions increase for major new source review at 80,000 pounds per year for VOCs, this projected emissions reduction would provide a significant environmental improvement. This estimate of actual reductions is based on projected reductions in emissions for 1996 year-to-date (a relatively high production year for the facility) that would be gained by a combination of pollution prevention projects, installation of new more efficient production equipment, decommissioning of older less efficent production equipment, and improved air pollution control equipment. Tennessee Eastman has already begun early work to develop an emission reduction strategy. For example, a new type of filtration equipment has been identified and piloted. The results were very favorable with increased product yields and decreased emissions. Projects are currently under consideration to install the first two of these filtration devices to gain further experience with their capabilities. If installed and successful, they would replace older technology which contributes approximately 75,000 pounds per year emission reduction toward the 600,000 pounds per year emission reduction target.

Tennessee Eastman understands that the ultimate level of environmental benefits to be achieved will be established in the Final Project Agreement (FPA) and would be developed through the stakeholder process where factors such as cost, technical feasibility, and degree of regulatory relief are considered.

Eastman proposes that compliance with the terms of the FPA be demonstrated through the Title V permit that will be issued for the facility. The Title V permit will include compliance certifications as well as required periodic monitoring, testing, recordkeeping, and reporting requirements tailor made to demonstrate to the public and regulatory authorities the compliance status with all applicable requirements. The terms of the FPA could be incorporated into the Title V permit so that it could serve as the long-term mechanism for compliance assurance.

3. **Stakeholder Support:** In addition to Eastman, the direct stakeholders will include EPA, the Tennessee Department of Environment and Conservation (TDEC), and representatives of the local community, including representation by Eastman's Community Advisory Panel.

During the proposal development stage, Eastman has initiated discussions with the following groups:

EPA XL staff
EPA Region IV
EPA's Division of Air and Radiation, Office of Policy and Evaluation
EPA Office of Air Quality Planning and Standards
TDEC Nashville (Deputy Commissioner and central office staff)
TDEC Johnson City Field Office
Eastman Community Advisory Panel

The Tennessee Eastman plant site is just under 100 km from a Class I area (Great Smoky Mountains National Park). In the past, the National Park Service has expressed interest in projects located within 100 km of Class I areas. Because of the distance and predominantly downwind location of Tennessee Eastman in relation to the Great Smoky Mountains National Park, the outcome of the XL project is not likely to have either a positive or negative impact on the Class I area. However, Eastman plans to discuss the XL project with National Park Service officials to determine their interest in the project.

Eastman considers local, state, and federal elected government representatives to also be stakeholders since they would be concerned with both environmental protection and the economic performance of a major manufacturing entity. Eastman plans to involve these stakeholders at appropriate junctures throughout the process.

**Stakeholder Involvement Process:** Upon selection into the XL process to develop a Final Project Agreement (FPA), Eastman would announce this selection over several media outlets including the following: notice in local newspapers (Kingsport Times-News, Knoxville News-Sentinel, Bristol Herald Courier, and Johnson City Press), notice on Eastman's Worldwide Web page, and internal Eastman media (biweekly newspaper, E-mail, and video news). These notices would solicit interest from interested parties as well as announce an open community meeting to be held in Kingsport to provide additional information to interested parties. Additionally, Eastman would contact selected national environmental groups to gauge interest they may have in the project.

Based on the response from these notices and meetings, Eastman, EPA, and State representatives would agree on a group of invitees to comprise the direct stakeholder group who would have the opportunity to participate in all discussions. The remaining interested parties would have pertinent information such as minutes of meetings, draft documents, and other pertinent information made available so that they can monitor the process and offer input when appropriate.

4. **Innovation/Multi-Media Pollution Prevention:** Eastman's proposed project to offer superior environmental benefits involves its organic chemical batch manufacturing facility. The XL agreement would result in setting an emission reduction goal for this facility. To reach this goal, Eastman anticipates incorporation of more efficient processing equipment that will reduce both air and wastewater emissions at the point of generation as well as improved air pollution control equipment. Additionally, some reduction of solid waste streams is anticipated. These improvements in processing equipment are expected to yield higher solvent recovery efficiencies and to be more energy efficient than older equipment.

   Eastman anticipates that innovative environmental technologies such as new processing equipment and/or control/recovery equipment will be considered in its strategy to achieve superior environmental results from its batch chemical manufacturing facility. Typically, it is not cost-effective to retrofit existing facilities with new technologies when other capital investments would yield a higher rate of return. The XL project would provide the incentive for Eastman to incorporate these newer technologies by freeing up capital resources that would otherwise be devoted to its response to mandated regulatory programs (i.e. regulations impacting burning of wastes in industrial coal-fired boilers) that yield little, none, or even negative environmental benefits.

5. **Transferability:** The following concepts may be transferrable to regulatory programs or applied to other facilities:

   A. The technologies employed to meet the emissions reduction goal for the batch manufacturing facility may be of interest to other like facilities and may be transferrable as input into setting of the MACT floor for these types of sources under the CAA section 112(d) MACT process.

   B. Utilization of a Title V permit to include XL agreements as applicable requirements should resolve questions of legal enforceability for the XL agreement and may be transferrable to other XL projects.

   C. The proposed site-specific conditional delisting which includes contingent management considerations would be a ground-breaking concept and may be transferrable.

   D. The concept of utilizing XL to alleviate imposition of strict command-and-control style regulations in cases where the proposed solution results in little, none, or even negative environmental benefits in exchange for an unrelated voluntary environmentally beneficial project may also have applicability elsewhere.

6. **Feasibility:** Eastman has the financial and administrative resources to implement the proposed XL project. Proven technologies as well as some newer technologies and equipment are anticipated to be employed to meet the emission reduction goals. When arriving at the emission reduction goals during the XL stakeholder process, it will be important that costs and limits of available technologies are considered.

7. **Monitoring, Reporting, and Evaluation:** Eastman anticipates that the XL project will result in an agreement to obtain a certain quantity of air emission reductions over a discrete period of time for the organic chemicals batch manufacturing facility. The project proposes use of the Title V permit to provide the mechanism to demonstrate compliance with these emission reduction goals. This reporting mechanism should provide a clear measure of Eastman's performance relative to the project goals and will incorporate all air emission limitations in one legal document. This is in keeping with one of the major goals of the Title V Operating Permit Program to provide a single mechanism to consolidate applicable requirements and provide increased monitoring along with annual certifications of compliance.

   During implementation phase of the air emissions reduction project, Eastman proposes to provide a semi-annual written status report to the stakeholders until all work encompassed by the XL agreement is completed.

   Additionally, Eastman is seeking a delisting of the biosludge through the formal delisting rulemaking process. It is anticipated that certain monitoring and recordkeeping would be required to demonstrate the delisted biosludge is managed in a safe manner.

8. **Shifting of Risk Burden:** There will be no unjust or disproportionate environmental impacts as a result of the project. The local community near the Eastman site will realize reductions in HAP and VOC emissions. Depending on the technologies employed, there could be some modest increases in other pollutants such as NOx and $SO_2$ emissions common to combustion sources. However, these increases will be small compared to the HAP and VOC reductions and would only impact the local area which already meets all National Ambient Air Quality Standards.

# Figure 1
## Waste Management at Tennessee Eastman Division