rec'd 12-15-92

Champion International Corp.
Post Office Box 87
Contonment, Florida 32533

December 15, 1992

Mr. Bruce Mitchell
Environmental Engineer
Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Dear Mr. Mitchell:

Please find attached the revised process description for Champion's Pensacola facility. This description was changed to reflect a refinement of the information used for the facility material balances for the proposed consent order process changes. The original process description included an unrealistic estimate in regards to softwood and hardwood delignification. The planned process changes to the softwood and hardwood pulping lines will improve delignification and decrease fiber degradation. As a result, these changes in the pulping processes will not result in measurable increases in black liquor solids. Consequently there will be no change in recovery furnace throughput.

The recovery furnaces currently utilize direct steam injection heaters for preheating concentrated black liquor. These heaters require extensive maintenance and are currently in a condition which presents a danger to operations. These heaters will be replaced by indirect heaters. These indirect heaters will allow for a safer and more stable recovery furnace operation.

Sincerely,

Kyle Moore
Environmental Supervisor

Attachment

DRAFT

SECTION 2

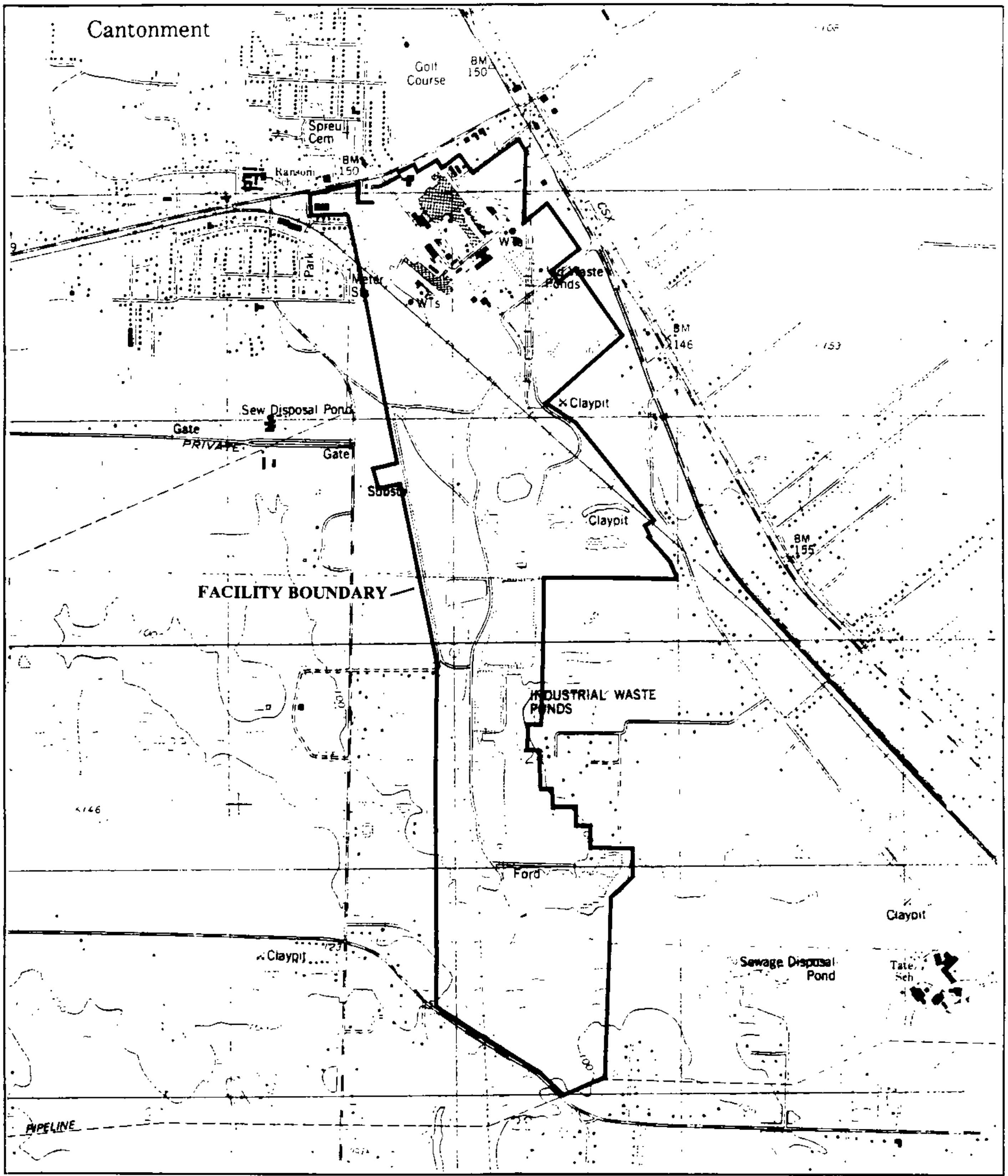
DESCRIPTION OF EXISTING MILL AND PROPOSED MODIFICATION

2.1 INTRODUCTION

The CHAMPION Pensacola Mill is located in Escambia County, Florida, near the town of Cantonment. Figure 2-1 is a site location map showing the proximity of the facility to the town of Cantonment. The land area around the site is relatively flat terrain and would be classified as a rural land use pattern based on EPA's classification scheme. The air quality in the area has been designated as attainment or unclassifiable for all ambient air quality standards.

CHAMPION's existing pulp mill has been in operation since 1941. Major mill expansion projects were completed in 1981 and 1986. The 1986 expansion resulted in a complete conversion to production of bleached kraft fine paper. The existing facilities were permitted by the Florida Department of Environmental Regulation (DER) in 1985. In 1991 a PSD Permit application was submitted to Florida DER for a new package gas-fired boiler. The CHAMPION Pensacola Mill is currently permitted for 1400 air-dried, bleached tons of pulp per calendar day.

The existing bleached kraft pulp mill includes wood preparation and storage, coal/wood fuel handling and storage, batch digesters, a continuous digester, brown stock washing, oxygen delignification, pulp bleaching facilities, recovery furnaces, power boilers, black liquor evaporators, smelt dissolving tanks, a Lime Kiln and calciner, recausticizing facility, and tall oil and turpentine byproducts facilities. Figure 2-2 presents a plot plan of the facility identifying the location of major emission points.



SOURCE: BASE MAP ADAPTED FROM USGS 7.5 MINUTE SERIES, CANTONMENT, FLA. QUADRANGLE, 1978, PHOTOREVISED 1987.

CHAMPION INTERNATIONAL CORPORATION
PENSACOLA FACILITY
CANTONMENT, ESCAMBIA COUNTY
FLORIDA

FIGURE 2-1
LOCATION MAP OF THE PENSACOLA FACILITY

2.2 MILL CONSENT ORDER

The Pensacola Mill is currently operating under a water permit consent order from the Florida DER. Compliance with water quality standards must be attained by December 1994 to meet the schedule contained in the consent agreements. The proposed mill modifications, contained in this air permit application, involve process changes aimed at reducing wastewater loads or minimizing waste load constituents to CHAMPION's treatment system in order to meet the requirements of the consent order.

It is important to point out that the proposed modification would not be undertaken if not for the consent order. The changes are not aimed at increasing mill production, nor are they intended to increase throughput on individual units other than to handle additional materials generated as a result of the wastewater load reduction program. However, the modifications will increase pulp production through the bleach plant due to minimization of fiber losses and fiber degradation. The expected bleached pulp production which will result from the modifications is 1555 tons per day, annual average. The maximum daily bleached pulp production rate is 1718 tons (see Process Flow Diagram 4 attachehd to the bleach plant permit application).

The proposed program can be characterized as follows:

- Modifications to the bleach plant operations to reduce effluent load to the wastewater treatment facilities.
- Process modifications to improve delignification in the pulping operation, and reduce bleach chemical requirements.
- Process modifications to minimize spills and leaks.
- Process modifications to reduce sewering of high concentration waste streams.

A description of the existing mill processes and the proposed modification to these processes follows.

2.3 EXISTING PROCESS DESCRIPTION

An even mix of hardwood and softwood pulp is produced from wood furnished by on-site and satellite chip mills. The wood chips are stored and screened in separate hardwood and softwood storage yards. The kraft cooking process is used to separate the lignin and wood fiber to produce brown pulp from wood chips. Softwood pulp is produced in a continuous digester, washed by a two-stage atmospheric diffusion washer, separated from wood knots by a disc knotter, and screened to separate rejects. Hardwood chips are cooked in twelve conventional direct steam batch digesters and discharged into two blow tanks common to all twelve digesters. The hardwood brown pulp is separated from wood knots by vibratory knotters and washed by two parallel lines of drum-type brown stock washers, and then screened to separate rejects. The softwood and hardwood pulps are further delignified in separate oxygen delignification reactors. After oxygen delignification, the hardwood and softwood pulps are further washed and bleached in a three-stage bleach plant. The hardwood and softwood bleach plants are identical and include:

- A chlorination stage with chlorine dioxide added;
- An oxidative caustic extraction stage; and
- A final chlorine dioxide bleaching stage.

The chlorine dioxide is generated on site in a unit designed to produce sixteen tons per day. Liquid chlorine, caustic soda, and liquid oxygen are all delivered to the site by rail or truck prior to use in the process. The chlorine and oxygen are vaporized prior to use.

The organic or lignin laden filtrates (black liquor) from the pulping, oxygen delignification, and washing processes are concentrated through two sets of evaporators. The No. 1 Evaporator Set mainly processes black liquor from the softwood pulp mill, while the No. 2 Evaporator Set processes hardwood black liquor. The black liquor is concentrated to about 65% solids and burned in two identical Babcock and Wilcox recovery furnaces (No. 1 and No. 2). The recovery furnaces produce steam for energy generation and heat for the pulp and paper making processes. The molten inorganic ash (smelt) from the recovery furnaces is dissolved in water to make green liquor which is then reprocessed into reusable cooking chemicals in the mill's causticizing plant. The causticizing process combines lime with the green liquor in a slaker reactor to produce a sodium hydroxide and sodium sulfide solution (white liquor), which is the principle wood chip cooking chemical. A by-product from the slaking reaction is calcium carbonate or lime mud. The lime mud is washed and then reburned in an Allis Chalmers type rotary kiln, and a Dorr-Oliver type fluidized bed calciner to produce reusable lime for the slaking reaction.

The mill utilizes five power boilers to produce steam for energy generation and provide heat for the pulping and paper making processes. Through cogeneration by utilization of two steam-driven turbines, the mill can produce nearly all of the electricity and steam required to run the mill operations. Power Boiler Nos. 1, 2, and 5 are natural gas fired. Power Boiler No. 3 is coal fired with natural gas as an alternate fuel. No. 4 Power Boiler is coal and bark fired with natural gas as an alternate fuel.

Product paper is produced from the pulp on two paper machines. Copy paper is produced on the No. 5 Paper Machine and is cut, sized, and packaged in a side processing plant for final sale. The paper produced on the No. 3 Paper Machine is shipped in either sheet or roll form to final customers. Market pulp is dried on a pulp drying machine as bales or rolls for final sale.

The mill utilizes sump systems in selected areas which are activated by conductivity to reclaim process losses into collection tanks. The reclaimed losses are reintroduced into the chemical recovery process. Distributed process control systems are used in nearly all the major process areas to improve process stability and control.

2.4 EXISTING MILL AIR SOURCES

The Pensacola Mill currently operates a total of twenty-nine (29) air sources which are covered by twenty-one (21) DER air permits. Table 2-1 is a summary list of the sources, the source ID number, and the permit number under which the source operates. The majority of the mill sources will not be impacted by the proposed consent order modifications. The sources which will be affected by the project include some sources which will be physically modified and will experience throughput increases, and other sources which will not be modified but will experience throughput increases.

The sources impacted by the project fall within three main areas of the mill pulping process as follows:

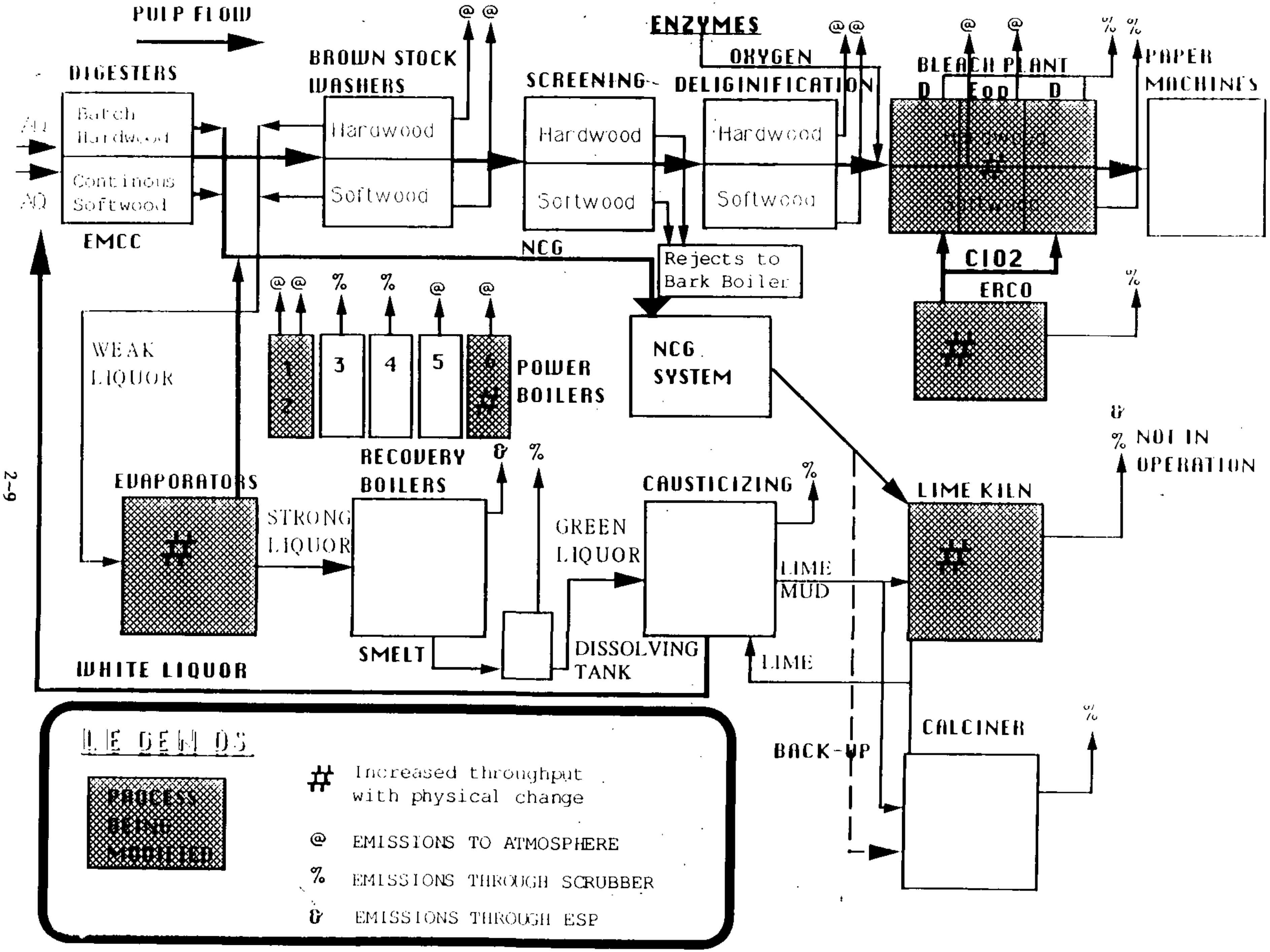
- Chemical cooking
- O_2 delignification and bleaching
- Chemical recovery and power generation

The existing sources in each area which will be affected by the project are depicted in Figure 2-3 and are discussed below.

TABLE 2-1
CHAMPION INTERNATIONAL CORPORATION - PENSACOLA MILL
FLORIDA DER AIR PERMITS

SOURCE	PERMIT #	SOURCE ID #
Wooodyard	AO17170657	10PEN1700 4252 & 58
Kamyr Digesters	AO17212422	10PEN1700 4254
Kamyr Diffusion Washer	AO17212422	10PEN1700 4254
Condensate Stripper	AO17212422	10PEN1700 4254
Batch Digesters	AO17212422	10PEN1700 4253
Brown Stock Washers	AO17212422	10PEN1700 4253
A Line 0_2 Delignification	AO17142570	10PEN1700 4250
B Line 0_2 Delignification	AO17142570	10PEN1700 4251
A Line Bleach Plant	AO17142570	10PEN1700 4250
B Line Bleach Plant	AO17142570	10PEN1700 4251
Salt Unloading	AO17142572	10PEN1700 4256 & 57
Chlorine Dioxide Generator	AO17142566	10PEN1700 4247, 48, & 49
Multiple Effect Evaporators	AO17212422	10PEN1700 4255
No. 1 Recovery Furnace	AO17181730	10PEN1700 4230
No. 1 Smelt Dissolving Tank	AO17181734	10PEN1700 4232
No. 2 Recovery Furnace	AO17181732	10PEN1700 4229
No. 2 Smelt Dissolving Tank	AO17181735	10PEN1700 4238
Lime Slaker	AO17137615	10PEN1700 4246
Lime Kiln	AO17181738	10PEN1700 4228
Fluo-Solids Unit (Calciner)	AO17151541	10PEN1700 4236
Tall Oil Plant	AO17181741	10PEN1700 4201
No. 1 Power Boiler	AO17181726	10PEN1700 4224
No. 2 Power Boiler	AO17181727	10PEN1700 4214
No. 3 Power Boiler	AO17146028	10PEN1700 4233
No. 4 Power Boiler	AO17145038	10PEN1700 4237
No. 5 Power Boiler	AO17203050	10PEN1700 4202
Coal Crushing and Handling	AO17143517	10PEN1700 4239 & 40
P5 Dry Additives	AO17213490	10PEN1700 4245
P5 Starch	AO17213492	10PEN1700 4244

FIGURE 2-3: CONSENT ORDER AIR PERMITTING PLAN - MILL LAYOUT



Chemical Cooking

The air emission sources in the chemical cooking area include the digesters, the brown stock washers, and the non-condensible gas (NCG) system. The digester systems on both the hardwood and softwood lines are closed systems which vent off-gases to the NCG system. Condensate from the cooking process is stripped to remove as much of the organic fraction as possible, and the off-gas from the condensate stripper is also vented to the NCG system. The NCG system itself vents to either the Lime Kiln or the lime calciner. The Lime Kiln is used as the primary control device for incinerating the NCGs with the calciner serving as backup.

The other sources in the cooking area include the diffusion washer on the softwood line and the brown stock washers on the hardwood line. The washers on both lines vent directly to the atmosphere.

O_2 Delignification and Bleaching

The washed brown stock from the cooking processes are further delignified using oxygen in separate O_2 reactors on each line. The O_2 delignification systems on each line are identical and include three vents each, as follows:

- The pre-O_2 decker washer vent
- The O_2 blow tank vent
- The post-O_2 washer vent

Following O_2 delignification, the pulp is processed through the bleaching system. The existing Pensacola bleaching operations are similar for each line and include the following sources:

- Cl/ClO_2 scrubber - This scrubber uses white liquor to control the emissions from the chlorination stage and chlorine dioxide stage of the existing bleaching sequence.

- E_o tower and washer vents - These sources are direct atmospheric vents from the oxidative extraction stages of the existing bleaching sequence.

ClO_2 for the existing mill bleaching sequence is generated on site in an ERCO R3H generator. The unit uses salt, sulfuric acid, and sodium chlorate to generate ClO_2 and Cl_2. The current bleaching sequence includes chlorine and chlorine dioxide in the first stage, an oxygen extractive stage, and chlorine dioxide in the final stage (C_DE_OD). There are five vent sources associated with the ClO_2 generator as follows:

- One tail gas scrubber - This scrubber uses sodium hydroxide to control Cl_2 and ClO_2 from the generator.

- Two ClO_2 storage tanks controlled by chilled water scrubbers.

- Two salt unloading/pneumatic transfer systems controlled by separate water spray towers.

Chemical Recovery and Power Generation Operations

The chemical recovery and power generation area includes the process equipment associated with recovering the cooking chemicals and the power boilers which generate the necessary process steam. Each of the sources affected by the proposed project are detailed below.

- *Multiple Effect Evaporators* - The evaporators are used to concentrate the weak black liquor prior to firing in the recovery furnaces. The off-gas from the evaporators is vented into the NCG system previously described and is ultimately combusted in the Lime Kiln or calciner.

- *Lime Kiln* - The Lime Kiln is used to calcine lime mud from the slaking process in the chemical recovery area. The kiln is permitted to burn natural gas and fuel oil. It is rated to produce up to 328 tons of CaO per day. It also serves as the primary control device for the NCGs generated in the pulping process. Particulate emissions from the kiln are controlled by a venturi scrubber and mist separator.

- *No. 1 Power Boiler* - This boiler is a natural gas-fired boiler originally rated to produce 140,000 pounds of steam per hour and having a derated heat input of 175mm BTU per hour.

- *No. 2 Power Boiler* - This boiler is a natural gas-fired boiler originally rated to produce 140,000 pounds of steam per hour and having a derated heat input of 170mm BTU per hour.

2.5 MODIFIED AND NEW AIR SOURCES

The project will affect the various air sources outlined in Section 2.4 on a source-specific basis. The following information is intended to provide details on the changes which each of the existing affected sources will experience, and also to provide information on the proposed new No. 6 Power Boiler which will replace the No. 1 and No. 2 Power Boilers as part of the project. The information is presented based upon the production area groupings previously identified in Section 2.4.

Chemical Cooking

Improved delignification in the cooking processes will play a role in reducing the wastewater treatment load. CHAMPION has identified two potential changes to be made to the digester processes to improve delignification, including:

- Extended modified continuous cooking (EMCC)
- Anthraquinone cooking (AQ)

It is important to understand that these are both changes in the cooking process which should not impact air emissions from the system. Therefore, by themselves EMCC and AQ do not require air permitting. Both methods have undergone trial efforts at the Pensacola Mill and process feasibility continues to be evaluated.

EMCC can only be considered in the continuous digester serving the softwood line. It involves changes in feeding the cooking liquor into the digester in stages and different cooking conditions. If successfully implemented, it is expected to produce a pulp which is easier to wash, therefore, improving lignin extraction. While some changes in piping are required for the digester, it is a sealed unit with any emissions ultimately vented directly to the NCG system. No increase in throughput occurs in the digester as a result of EMCC.

Anthraquinone (AQ) is an organic catalyst which accelerates and increases the selectivity of the wood cooking chemicals in the delignification of the pulp fiber. It can potentially be used in both the batch digesters serving the hardwood line and the continuous digester serving the softwood line. The ultimate goal of applying AQ is a reduction in the organic loading, the color, and the conductivity in the bleach plant effluent.

The project will require the installation of storage and handling equipment for AQ. AQ is water soluble and, therefore, CHAMPION proposes to utilize a system designed for transporting and storing water-soluble anthraquinone (SAQ). AQ is not on the Clean Air List of 189 Air Toxics. It is a reportable substance under CERCLA and adequate containment of the storage and unloading facility will be provided.

While both EMCC and AQ are changes in the digester cooking processes, it is believed that there will be no changes resulting in the emissions from the digesters following implementation of these methods. Since feed rate to the digesters will not change, the material flow rate from the digesters to the brown stock washers will also be unchanged. The increase in black liquor solids from improved pulp delignification is offset by a reduction in solids due to improved digester selectivity and fiber preservation. Therefore no net change in liquor solids to recovery is anticipated. Furthermore, air emissions from the brown stock washers should be no different following implementation of the improved cooking methods.

O_2 Delignification and Bleaching

The washed brown pulp from the cooking processes goes through further delignification in O_2 reactors on each line. If these improvements in the digester cooking processes occur, less fiber may be wasted which could result in an increase in the fiber processed through the O_2 delignification systems. Since there could also be reduced levels of lignin in the brown pulp, the emissions from the pre- and post-O_2 washers and the O_2 blow tank are not expected to change as a result of the project, even if fiber throughput increases.

The most significant change in the pulp production process will be the conversion of the existing C_DE_OD bleach plant. This will be accomplished by elimination of the existing modification of the chlorine dioxide generator. In addition, enzymes may be added to the high density storage tanks between the oxygen delignification systems and the bleach plants. Each of these changes is detailed below.

- *Enzyme Bleach Boosting* - Enzyme bleach boosting is a new technique which must still undergo field trials. It involves the application of xylanase enzyme prior to pulp bleaching with the purpose of modifying the chemical structure to make subsequent bleach stages more efficient. The high degree of specificity of action and mild working conditions generally result in fewer non-desirable byproducts. This tends to give a more efficient process and should lead to improved process yields. Significant reductions in chlorine dioxide required to bleach pulp are possible with no significant impact on pulp properties.

  From an environmental viewpoint, enzymes are safe and quite desirable. They are easy to handle, require mild conditions for reaction, are effective in small amounts, biodegradable, and non-toxic. The xylanase enzymes to be used in pulp bleaching are categorized as food grade products.

  The use of enzymes will require the installation of enzyme storage and handling facilities. Since enzymes are water soluble, there will be no air emission associated with this system.

- *Chlorine Dioxide Substitution for Chlorine* - The mill will eliminate the use of molecular chlorine as a bleaching agent, and the first stage of each bleach plant will be 100% chlorine dioxide. This will require a modification of the existing chlorine dioxide generator.

The existing generator is an ERCO R3H which uses salt, sulfuric acid, hydrochloric acid, and sodium chlorate to generate chlorine dioxide and chlorine. The generator will be modified to an R8/R10 process which uses methanol, sulfuric acid, and sodium chlorate to generate chlorine dioxide. The conversion to R8/R10 is necessary to eliminate the chlorine gas byproduct which is currently generated in the R3H process. The modified reactor capacity will be increased from the present 16 tons per day to 37.4 tons per day of chlorine dioxide. A third ClO_2 storage tank will be added and the existing chlorine absorption towers will be converted to chlorine dioxide absorption towers.

The existing storage tank scrubbers will continue to vent the existing two tanks and will also vent the new third tank. The exhaust from the two tank vent scrubbers will be rerouted to the tail gas scrubber. The tail gas scrubber will be modified by installing an extra 10 feet of tower and the scrubbing media will be changed from sodium hydroxide to white liquor (sodium hydroxide plus sodium sulfide), as depicted on Process Flow Diagram 3 attached to the application forms.

A new 21,000 gallon methanol storage tank will be installed as part of the project. The tank will be nitrogen blanketed and equipped with a conservation vent.

The existing salt unloading and storage system will be shut down and dismantled.

The existing bleach plant scrubbers are equally effective for chlorine and chlorine dioxide removal, and the scrubber systems have adequate capacity for the expected emissions. Therefore, no change in the bleach plant scrubber system is planned.

- *Peroxide Fortified Oxidative Caustic Extraction* - Hydrogen peroxide is an oxidizing agent that works optimally in alkaline conditions and is typically applied to the pulp in a 50% solution. The peroxide is applied in the oxidative extraction stage. The hydrogen peroxide is a non-specific oxidizer that reacts as readily with the extracted lignin as it does with the pulp. Because of the non-specificity, half of the peroxide decolorizes the extraction filtrate. The other half of the charge increases the brightness of the pulp leaving the extraction stage. Because of the higher brightness achievable, chlorine dioxide charged to either the first stage or the final bleaching stage is reduced.

  The use of hydrogen peroxide will require the installation of a storage and handling system for the chemical. The peroxide will completely react in the extraction tower. There are no air emissions associated with the use of hydrogen peroxide.

Evaporators and Power Generation

Mill improvements aimed at reducing the amount of wastewater generated by minimizing process losses will increase the overall liquid load to the multiple effect evaporators. Due to the increase in load, the evaporators will be upgraded. Other improvements to the existing facility associated with minimizing process losses include upgrading the evaporator foul condensate stripper and modifying the Lime Kiln. Each of the affected air emission sources are discussed below.

- *Evaporation Capacity Upgrade* - Reclaimed process chemicals are processed through the black liquor evaporators. These evaporators are currently at capacity. Any added volume for evaporating reclaimed sewer losses will require added capacity.

With the planned process loss containment project and pulp-mill process changes, it is estimated that a 50% increase in evaporation capacity of the No. 2 set evaporator will be needed. This will be accomplished by the addition of two new evaporator effects.

The primary purpose of this capacity upgrade is to evaporate the water contained in these streams. Although the color and B.O.D. reclaimed represents a significant portion of the waste water load, the associated solids contribution to the chemical recovery system is insignificant. The recovery boilers and associated equipment are not impacted.

- *Evaporator Foul Condensate Stripping Upgrade* - Various volatile organic compounds are released with digester steam after the cooking of wood chips. Some of the volatile compounds or non-condensible gases are piped to the Lime Kiln and burned. The remaining portion is dissolved and carried in the digester steam (contaminated) condensate to a heat recovery system. Condensates from the black liquor evaporation process are also rich in dissolved organic compounds. Most of the organic component in digester steam and evaporator condensates is methanol and other low molecular weight compounds. These compounds produce a very large biochemical oxygen demand on the wastewater treatment facility. The mill currently collects and steam strips most of the more concentrated or "foul" condensates. The liberated volatile organic compounds are then burned with the non-condensible gases in the Lime Kiln. However, a significant BOD load is discharged to the waste treatment plant due to an excess of less contaminated condensates and the lack of stripping capacity.

CHAMPION has evaluated the upgrade of the existing contaminated condensate stripper and the installation of an additional steam stripper. With added stripper capacity, initial estimates have shown that the mill effluent BOD load to the wastewater treatment plant could be reduced by as much as 15%. The evaluation is currently not completed, and the exact configuration has not been determined.

The installation of a stripper will not directly affect air emissions except to the extent these materials are being stripped in the wastewater treatment system. In that regard, a steam stripper will directly reduce the emissions of volatile compounds.

- *Lime Reburning Capacity - Lime Kiln-Mud Dryer Upgrade* - Currently, the Lime Kiln and calciner cannot process all of the lime mud produced by the causticizing process. The difference between the current lime reburning capability and the requirements to produce white liquor for the pulping process is made up with purchased fresh lime. The excess lime mud (calcium carbonate) produced in the causticizing operation is discharged to the sewer in a weak wash solution. The sewered lime mud flows to the waste treatment primary settling basin, is dredged with other mill settled sludge, and pumped to the decanting basins. The combined mud and mill sludge is reclaimed from the decanting basins and hauled to the landfill. The weak wash solution sewered with the lime mud is an alkaline solution that has to be neutralized in the settling basin by carbon dioxide injection. However, the alkaline solution increases the mill effluent conductivity.

An upgraded kiln capacity will supply the total lime requirements eliminating the sewering of lime mud in weak wash solution as part of daily operation. Initial estimates indicate that the required capacity increase will reduce daily landfill by approximately 100 tons and reduce the conductivity by about 20%.

The increase in Lime Kiln capacity will be accomplished by the installation of a lime mud dryer. The upgraded Lime Kiln-Mud Dryer system will be capable of producing up to 500 tons of CaO per day. A new multifield electrostatic precipitator will be added and the existing scrubber will be modified to provide SO_2 scrubbing capability. The separator will be physically modified as a packed column utilizing recirculating NaOH as the scrubbing medium. The scrubber will be used only on an as needed basis to meet the proposed SO_2 emission limits. Figure 2-4 shows a representation of the system.

The fluid bed calciner will not be changed, and the normal throughput will not change.

The amount of lime added to the green liquor in the slaker will not change. The additional reburned lime from the modified Lime Kiln will allow the reduction of purchased fresh lime.

There will be a slight increase in non-condensible gases (NCGs) burned in the Lime Kiln-Mud Dryer. The only impact will be to increase the amount of sulfur dioxide formed in the kiln due to the sulfur in the NCGs. Any increase in sulfur dioxide will be captured within the kiln and/or by the sulfur dioxide scrubber. The increase in sulfur dioxide emissions from the lime kiln-mud dryer is not PSD significant.

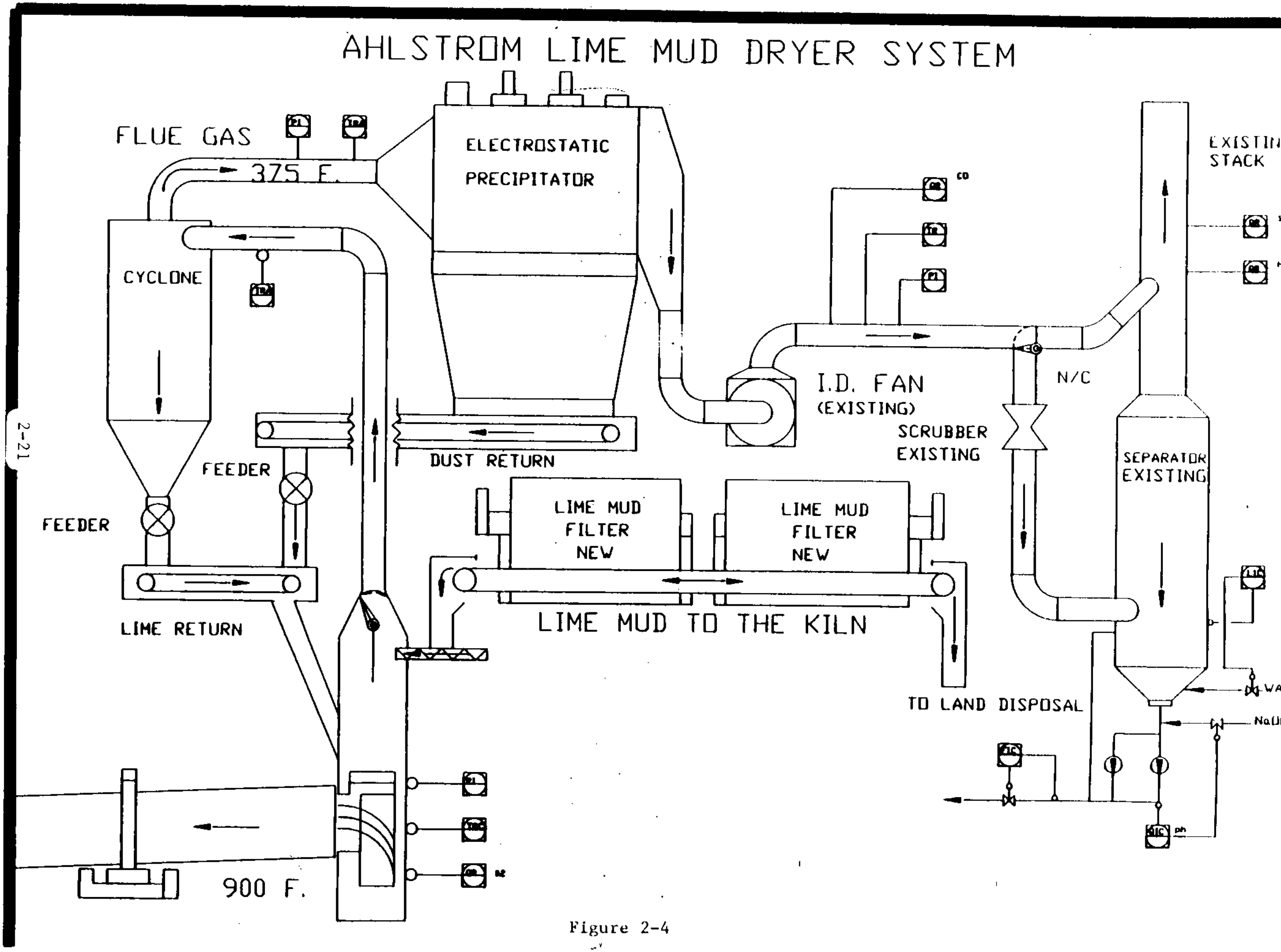

AHLSTROM LIME MUD DRYER SYSTEM
FLUE GAS
PI
TRA
375 F.
ELECTROSTATIC
PRECIPITATOR
CYCLONE
TRA
FEEDER
DUST RETURN
FEEDER
LIME RETURN
LIME MUD
FILTER
NEW
LIME MUD
FILTER
NEW
LIME MUD TO THE KILN
I.D. FAN
(EXISTING)
SCRUBBER
EXISTING
N/C
QR
CO
TR
PI
EXISTIN
STACK
SEPARATOR
EXISTING
LIC
TO LAND DISPOSAL
FIC
QIC
ph
PI
TRC
QR
O2
900 F.

Figure 2-4

- *Steam Capacity Upgrade (No. 6 Package Boiler)* - Added steam capacity will be required to support the process modifications. The specific added steam demand will come from an increase in evaporation and contaminated condensate stripping capacity, black liquor heaters, the cooking modifications, and bleach plant load reduction technologies.

  With the addition of the No. 6 power boiler, CHAMPION will shut down No. 1 and No. 2 power boilers. These boilers, built in the early 50s, are in poor repair and poor efficiency.

  A new high pressure steam boiler to supply 350,000 pounds per hour additional steam load for consent order projects and replacement of the two obsolete power boilers will be installed.

SECTION 3
SUMMARY OF EMISSIONS

3.1 INTRODUCTION

A baseline and proposed future emissions inventory has been developed for the Pensacola mill sources affected by the proposed modifications. A list of the affected sources is included in Table 3-1. The inventory includes baseline emission rates from the existing affected sources and future emission rates for the proposed new and modified sources. A comparison of baseline and future emissions is presented in Table 3-2.

The baseline emission rates have been developed based on the two year period dating from July 1, 1990 through June 30, 1992. The baseline rates were determined using individual source operating information including: fuel use data, process throughput data, actual source operating hours, and continuous emission monitoring (CEM) data where available. For each affected source, emission factors were developed from available emission tests or CEM data or from applicable literature. The factors were then used with the operating data to calculate annual baseline emission rates. Future emissions were projected using vendor data or guarantees, where available.

Presently, there is very limited data available for determining VOC emissions from the Bleach Plant sources. However, a good data base is available for chloroform emissions including testing performed by the National Council of the Paper Industry for Air and Stream Improvement (NCASI) at the mill in 1990. Therefore, as discussed with Florida DER, CHAMPION is using chloroform as a surrogate for total VOC emissions from the Bleach Plant for the purposes of this application.

TABLE 3-1

CHAMPION - PENSACOLA
SUMMARY OF AFFECTED SOURCES

BASELINE SOURCES	
	No. 1 Power Boiler
	No. 2 Power Boiler
	Lime Kiln
A-Line	Softwood Bleach Plant Scrubber Softwood Bleach Plant E_o Washer
B-Line	Hardwood Bleach Plant Scrubber Hardwood Bleach Plant E_o Washer
FUTURE SOURCES	
	No. 6 Power Boiler
	Lime Kiln-Mud Dryer
A-Line	Softwood Bleach Plant Scrubber Softwood Bleach Plant E_o Washer
B-Line	Hardwood Bleach Plant Scrubber Hardwood Bleach Plant E_o Washer

TABLE 3-2
CHAMPION
PENSACOLA, FLA
SUMMARY OF BASELINE ANNUAL EMISSIONS VS FUTURE MAXIMUM ANNUAL EMISSIONS

(tons/yr)

SOURCE	NO_x			SO_2			CO		
	ACTUAL	FUTURE	CHANGE	ACTUAL	FUTURE	CHANGE	ACTUAL	FUTURE	CHANGE
#6 POWER BOILER	NA	140.07	140.07	NA	2.17	2.17	NA	233.45	233.45
LIME KILN MUDDRYER(3)	63.46	215.93	152.48	1.76	28.43	26.67	5.73	29.57	23.83
#1 POWER BOILER	40.57	NA	-40.57	0.38	NA	-0.38	40.57	NA	-40.57
#2 POWER BOILER	113.20	NA	-113.20	0.25	NA	-0.25	26.95	NA	-26.95
LINE A- Cl_2 SCRUBBER(1)	NA	NA	NA	NA	NA	NA	NA	NA	NA
LINE A- E_o WASHER(1)	NA	NA	NA	NA	NA	NA	NA	NA	NA
LINE B- Cl_2 SCRUBBER(2)	NA	NA	NA	NA	NA	NA	NA	NA	NA
LINE B- E_o WASHER(2)	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTALS	217.23	356.01	138.78	2.39	30.60	28.21	73.26	263.02	189.76

SOURCE	PM/PM_{10}			VOC			TRS		
	ACTUAL	FUTURE	CHANGE	ACTUAL	FUTURE	CHANGE	ACTUAL	FUTURE	CHANGE
#6 POWER BOILER	NA	11.67	11.67	NA	23.35	23.35	NA	NA	NA
LIME KILN MUDDRYER(3)	57.32	47.74	-9.58	1.68	165.13	163.45	8.27	6.39	-1.88
#1 POWER BOILER	2.03	NA	-2.03	10.84	NA	-10.84	NA	NA	NA
#2 POWER BOILER	1.35	NA	-1.35	6.72	NA	-6.72	NA	NA	NA
LINE A- Cl_2 SCRUBBER(1)	NA	NA	NA	10.72	1.48	-9.24	NA	NA	NA
LINE A- E_o WASHER(1)	NA	NA	NA	1.16	0.16	-1.00	NA	NA	NA
LINE B- Cl_2 SCRUBBER(2)	NA	NA	NA	15.30	1.48	-13.82	NA	NA	NA
LINE B- E_o WASHER(2)	NA	NA	NA	2.04	0.16	-1.88	NA	NA	NA
TOTALS	60.69	59.41	-1.28	48.45	191.76	143.30	8.27	6.39	-1.88

(1) Softwood
(2) Hardwood
(3) 95% control efficiency is assumed for the future case SO_2 condition.

As a result of the proposed modifications, there may be a slight (1-2%) increase in fiber throughput in the oxygen delignification process on each line. However, available VOC emission data is extremely limited for this source. The variability in the available test data suggests that the actual difference between existing and future VOC emissions would likely not be measurable using the available test methods. CHAMPION will commit to testing these sources following the mill modifications to clearly identify future emission rates.

The following sections briefly identify the basis for each emission factor and source in the emissions inventory. The emission factor development calculations and sample emission rate calculations are included in Appendix A. Appendix B includes source test summary data and other information supporting the emission data. Appendix C includes the source operating data, fuel use data, and annual emission summaries for each of the baseline years.

3.2 BASELINE EMISSION RATES

A summary of the emission factors utilized for baseline emissions is presented in Table 3-3. The calculated baseline emission rates for the two year averaging period for the affected sources are presented in Table 3-4.

The following subsections provide a brief source-by-source description of the development of individual emission factors.

3.2.1 No. 1 Power Boiler

The No. 1 Power Boiler has a design heat input rating of 180 MMBtu per hour. The primary fuel fired in the boiler is natural gas. However, the boiler is also equipped to burn No. 6 fuel oil for emergency use. For the baseline period, natural gas was the only fuel fired and emissions are based on natural gas usage for the period. The following information presents the basis for the selected emission factors for each pollutant.

TABLE 3-3
CHAMPION
PENSACOLA, FLA
SUMMARY OF EMISSION FACTORS AND HOURLY EMISSION RATES

BASELINE EMISSIONS

SOURCE	NO_x		SO_2		CO		PM/PM_{10}		VOC		TRS	
	EMISSION FACTOR	HOURLY RATE (lb/hr)[5]	EMISSION FACTOR	HOURLY RATE (lb/hr)[5]	EMISSION FACTOR	HOURLY RATE (lb/hr)[5]	EMISSION FACTOR	HOURLY RATE (lb/hr)[5]	EMISSION FACTOR	HOURLY RATE (lb/hr)[5]	EMISSION FACTOR	HOURLY RATE (lb/hr)[5]
#1 POWER BOILER	0.1 lb/MMBtu	10.11	0.00093 lb/MMBtu	0.09	0.1 lb/MMBtu	10.11	0.005 lb/MMBtu	0.51	2.70 lb/hr	2.7	NA	NA
#2 POWER BOILER	0.42 lb/MMBtu	45.18	0.00093 lb/MMBtu	0.10	0.1 lb/MMBtu	10.76	0.005 lb/MMBtu	0.54	2.68 lb/hr	2.68	NA	NA
LIME KILN	15.5 lb/hr	15.5	0.43 lb/hr	0.43	1.4 lb/hr	1.4	14.0 lb/hr	14	0.41 lb/hr	0.41	2.02 lb/hr	2.02
LINE A Cl_2 SCRUBBER[1]	NA	NA	NA	NA	NA	NA	NA	NA	0.083 lb/ADTP	2.77 [3]	NA	NA
LINE A E_o WASHER[1]	NA	NA	NA	NA	NA	NA	NA	NA	0.009 lb/ADTP	0.30 [3]	NA	NA
LINE B Cl_2 SCRUBBER[2]	NA	NA	NA	NA	NA	NA	NA	NA	0.120 lb/ADTP	3.00 [4]	NA	NA
LINE B - E_o WASHER[2]	NA	NA	NA	NA	NA	NA	NA	NA	0.016 lb/ADTP	0.40 [4]	NA	NA

[1] Softwood
[2] Hardwood
[3] The hourly rate is based on the current annual average permit limit of 800 ADTP/day (softwood) and pulp production 24 hr/day.
[4] The hourly rate is based on the current annual average permit limit of 600 ADTP/day (hardwood) and pulp production 24 hr/day.
[5] The hourly emission rate is an average hourly emission rate for the two year period.

TABLE 3-4
CHAMPION
PENSACOLA, FLA
SUMMARY OF BASELINE EMISSION RATES
JULY 1990 - JUNE 1992
(tons/year)

SOURCE	NO_x	SO_2	CO	PM/PM_{10}	VOC	TRS
#1 POWER BOILER	40.57	0.38	40.57	2.03	10.84	NA
#2 POWER BOILER	113.20	0.25	26.95	1.35	6.72	NA
LIME KILN	63.46	1.76	5.73	57.32	1.68	8.27
LINE A- Cl_2 SCRUBBER(1) (3)	NA	NA	NA	NA	10.72	NA
LINE A- E_0 WASHER(1) (3)	NA	NA	NA	NA	1.16	NA
LINE B- Cl_2 SCRUBBER(2) (4)	NA	NA	NA	NA	15.30	NA
LINE B- E_0 WASHER(2) (4)	NA	NA	NA	NA	2.04	NA
TOTAL	217.23 tons	2.39 tons	73.26 tons	60.69 tons	48.45 tons	8.27 tons

(1) Softwood

(2) Hardwood

(3) VOC emission rates are based on the lb/ADTP emission factor and actual softwood pulp (ADTP) production.

(4) VOC emission rates are based on the lb/ADTP emission factor and actual hardwood pulp (ADTP) production.

- Nitrogen Oxides (NO_x)

  The NO_x emission factor is based upon the average NO_x mass emission rates and total heat input rates measured during a series of three test runs conducted on 8 February 1991. The NO_x emission factor is 0.10 lb/MMBtu. The baseline NO_x emission rate is 10.11 lb/hr.

- Sulfur Dioxide (SO_2)

  The SO_2 emission factor is based upon the typical sulfur content of the natural gas burned in the No. 1 Power Boiler as supplied by the gas vendor and the assumption of 100% conversion to SO_2. The SO_2 emission factor is 0.00093 lbs/MMBtu. The baseline SO_2 emission rate is 0.09 lb/hr.

- Carbon Monoxide (CO)

  The CO emission factor used is the same emission factor reported in CHAMPION's PSD permit application for the No. 5 Power Boiler submitted in February 1991. This factor was based on testing conducted on CHAMPION's No. 5 Power Boiler on 16-17 May 1989. The CO emission factor is 0.1 lb/MMBtu. The baseline CO emission rate is 10.11 lb/hr.

- Total Suspended Particulate Matter and Particulate Matter less than 10 microns (PM/PM_{10})

  The PM/PM_{10} emission factor is based on the AP-42 emission factor for natural gas (Table 1.4-1, utility boiler size). This factor is 5 lb/10^6 cf. Assuming a natural gas heating value of 1000 Btu/scf, the PM/PM_{10} emission factor is 0.005 lb/MMBtu. The baseline PM/PM_{10} emission rate is 0.51 lb/hr.

- Volatile Organic Compounds (VOC)

  The VOC emission factor used is based upon the same VOC concentration reported in CHAMPION's PSD permit application for the No. 5 Power Boiler submitted in February 1991. This concentration of 20 ppm (as carbon) was established by testing conducted on 16-17 May 1989 and is used in conjunction with volumetric flow rate data from the NO_x testing on the No. 1 Power Boiler conducted on 8 February 1991. The baseline VOC emission rate is 2.70 lb/hr (as propane).

3.2.2 No. 2 Power Boiler

The No. 2 Power Boiler has a design heat input rating of 220 MMBtu per hour. The primary fuel fired in the boiler is natural gas. However, the boiler is also equipped to burn No. 6 fuel oil for emergency use. For the baseline period, natural gas was the only fuel fired and emissions are based on natural gas usage. The following information presents the basis for the selected emission factors for each pollutant.

- Nitrogen Oxides (NO_x)

The NO_x emission factor is based upon the average NO_x mass emission rates and total heat input rates measured during a series of three test runs conducted on 9 February 1991. The NO_x emission factor is 0.42 lb/MMBtu. The baseline NO_x emission rate is 45.18 lb/hr.

- Sulfur Dioxide (SO_2)

The SO_2 emission factor is based upon the typical sulfur content of the natural gas burned in the No. 2 Power Boiler as supplied by the gas vendor and the assumption of 100% conversion to SO_2. The SO_2 emission factor is .00093 lb/MMBtu. The baseline SO_2 emission rate is 0.10 lb/hr.

- Carbon Monoxide (CO)

The CO emission factor used is the same emission factor reported in CHAMPION's PSD permit application for the No. 5 Power Boiler submitted in February 1991. This factor was based on testing conducted on CHAMPION's No. 5 Power Boiler on 16-17 May 1989. The CO emission factor is 0.1 lb/MMBtu. The baseline CO emission rate is 10.76 lb/hr.

- Total Suspended Particulate Matter and Particulate Matter less than 10 microns (PM/PM_{10})

  The PM/PM_{10} emission factor is based on the AP-42 emission factor for natural gas (Table 1.4-1, utility boiler size). This factor is 5 lb/10^6 cf of natural gas. Assuming a natural gas heating value of 1000 Btu/scf, the PM/PM_{10} emission factor is 0.005 lb/MMBtu. The baseline PM/PM_{10} emission rate is 0.54 lb/hr.

- Volatile Organic Compounds (VOC)

  The VOC emission factor used is based upon the same VOC concentration reported in CHAMPION's PSD permit application for the No. 5 Power Boiler submitted in February 1991. This concentration of 20 ppm (as carbon) was established by testing conducted 16-17 May 1989 and is used in conjunction with volumetric flow rate data from the NO_x testing on the No. 2 Power Boiler conducted on 9 February 1991. The baseline VOC emission rate is 2.68 lb/hr (as propane).

3.2.3 Lime Kiln

The Pensacola Lime Kiln is rated to produce approximately 328 tons of lime per day. The kiln fires natural gas and has a maximum heat input rate of approximately 123 MMBtu per hour. The kiln is also used to incinerate non-condensible gases (NCG) from the Kraft mill process.

- Nitrogen Oxides (NO_x)

  The NO_x emission factor is based on the average of two series of tests conducted on 13 December 1989 and 11-12 April 1990. The baseline NO_x emission rate is 15.5 lb/hr.

- Sulfur Dioxide (SO_2)

  The SO_2 emission factor is an average of four series of tests conducted 26 April, 16 May, 13 December 1989 and 11-12 April 1990. The 16 May 1989 test results included in the average only include the test runs during which all NCG streams were ducted to the Lime Kiln. The results included are the most representative of normal kiln operations. The baseline SO_2 emission rate is 0.43 lb/hr.

- Carbon Monoxide (CO)

  The CO emission factor is an average of two series of tests conducted on 13 December 1989 and 11-12 April 1990. The baseline CO emission rate is 1.4 lb/hr.

- Total Suspended Particulate Matter and Particulate Matter less than 10 microns (PM/PM_{10})

  The PM/PM_{10} emission factor is based on an average of four series of tests conducted 26 April 1989, 12 December 1989, 19 March 1991, and 27 March 1992. The baseline PM/PM_{10} emission rate is 14.0 lb/hr.

- Volatile Organic Compounds (VOC)

  The VOC emission factor is based on an average of two series of tests conducted 13 December 1989 and 11-12 April 1990. The baseline VOC emission rate is 0.41 lb/hr (as propane).

- Total Reduced Sulfur Compounds (TRS)

  The TRS emission factor is based on the 2-year average CEM data and the average gas stream volumetric flow rate from the Lime Kiln particulate testing conducted 19 March 1991 and 27 March 1992. The TRS value is assumed to be 100% H_2S for calculating a mass emission rate. The baseline TRS emission rate is 2.02 lb/hr.

3.2.4 Bleach Plant Sources

As previously discussed, there is very limited data available for determining emissions from the Bleach Plant sources identified in Table 3-1. Data is available, however, for chloroform emissions from these sources including testing by the National Council of the Paper Industry for Air and Stream Improvement (NCASI) at the mill in 1990. The proposed Pensacola Mill Bleach Plant modification entails 100% substitution of chlorine dioxide for molecular chlorine and is predicted to result in a 90% or greater reduction in the chloroform generation rate and subsequent emissions.

EPA is presently developing standard test methods and will be conducting extensive testing to identify and quantify VOC and hazardous air pollutant (HAP) emissions from pulp mill processes including Bleach Plants. This effort is intended to support the development over the next several years of industry MACT standards. However, there is presently no data available which CHAMPION can use to identify either baseline or future VOC emissions from the Pensacola bleaching processes other than the chloroform data. CHAMPION is therefore using chloroform as a surrogate for total VOC emissions from the Bleach Plant for the purposes of this application.

The Bleach Plant sources included in this analysis are the scrubber and the Eo washer for both the A-line (softwood) and B-line (hardwood). The VOC emissions are based on the NCASI testing at the Mill in 1990. A summary of the actual test results are included in Appendix D.

3.2.4.1 A-Line Scrubber

- Volatile Organic Compounds (VOC)

  The VOC emissions factor is 0.083 lb/ADTP. The associated baseline VOC emission rate is 2.77 lb/hr.

3.2.4.2 A-Line E_o Washer

- Volatile Organic Compounds (VOC)

  The VOC emission factor is 0.009 lb/ADTP. This corresponds to a baseline VOC emission rate of 0.30 lb/hr.

3.2.4.3 B-Line Scrubber

- Volatile Organic Compounds (VOC)

  The VOC emission factor is 0.120 lb/ADTP. The baseline VOC emission rate is 3.00 lb/hr.

3.2.4.4 B-Line E_o Washer

- Volatile Organic Compounds (VOC)

  The VOC emission factor is 0.016 lb/ADTP. This corresponds to a baseline VOC emission rate of 0.40 lb/hr.

3.3 FUTURE EMISSION RATES

A summary of the emission factors utilized for calculating future emissions and the projected hourly emission rates are presented in Table 3-5. The calculated annual future emission rates for the affected sources are presented in Table 3-6.

The following subsections provide a brief source-by-source description of the development of individual emission factors.

3.3.1 Lime Kiln-Mud Dryer

The modified Lime Kiln-Mud Dryer is rated to produce 450 tons of lime per day and may be capable of achieving a production rate of up to 500 tons of lime per day. The kiln will fire natural gas or fuel oil and has a maximum heat input rate of 150 MMBtu/hr. The Lime Kiln-Mud Dryer will continue to be used to incinerate NCGs from the kraft mill process in the future. Projected emission rates are based upon the vendor's guaranteed production rate of 450 tons per day. CHAMPION will commmit to meeting the emission limits based upon the rated capacity at peak production rates of up to 500 tons per day.

TABLE 3-5
CHAMPION
PENSACOLA, FLA
SUMMARY OF EMISSION FACTORS AND HOURLY EMISSION RATES

FUTURE MAXIMUM ANNUAL EMISSIONS

SOURCE	NO_x EMISSION FACTOR	NO_x HOURLY RATE (lb/hr)	SO_2 EMISSION FACTOR	SO_2 HOURLY RATE (lb/hr)	CO EMISSION FACTOR	CO HOURLY RATE (lb/hr)
#6 POWER BOILER	0.06 lb/MMBtu	32.0	0.00093 lb/MMBtu	0.50	0.1 lb/MMBtu	53.3
LIME KILN MUDDRYER	49.3 lb/hr	49.3	6.49 lb/hr	6.49	6.75 lb/hr	6.75
LINE A- Cl_2 SCRUBBER(1)(3)	NA	NA	NA	NA	NA	NA
LINE A- E_o WASHER(1)(3)	NA	NA	NA	NA	NA	NA
LINE B- Cl_2 SCRUBBER(2)(4)	NA	NA	NA	NA	NA	NA
LINE B- E_o WASHER(2)(4)	NA	NA	NA	NA	NA	NA

SOURCE	PM/PM_{10} EMISSION FACTOR	PM/PM_{10} HOURLY RATE (lb/hr)	VOC EMISSION FACTOR	VOC HOURLY RATE (lb/hr)	TRS EMISSION FACTOR	TRS HOURLY RATE (lb/hr)
#6 POWER BOILER	0.005 lb/MMBtu	2.67	0.01 lb/MMBtu	5.33	NA	NA
LIME KILN MUDDRYER	10.9 lb/hr	10.9	37.7 lb/hr	37.7	1.46 lb/hr	1.46
LINE A- Cl_2 SCRUBBER(1)(3)	NA	NA	0.3375 lb/hr	0.3375	NA	NA
LINE A- E_o WASHER(1)(3)	NA	NA	0.0375 lb/hr	0.0375	NA	NA
LINE B- Cl_2 SCRUBBER(2)(4)	NA	NA	0.3375 lb/hr	0.3375	NA	NA
LINE B- E_o WASHER(2)(4)	NA	NA	0.0375 lb/hr	0.0375	NA	NA

(1) Softwood

(2) Hardwood

(3) The VOC emission factor is based on 750 ADTP/day (softwood) and pulp production 24 hr/day.

(4) The VOC emission factor is based on 750 ADTP/day (hardwood) and pulp production 24 hr/day.

TABLE 3-6
CHAMPION
PENSACOLA, FLA

SUMMARY OF FUTURE MAXIMUM ANNUAL EMISSIONS

SOURCE	NO_x	SO_2	CO	PM/PM_{10}	VOC	TRS
#6 POWER BOILER	140.07 tons	2.17 tons	233.45 tons	11.67 tons	23.35 tons	NA
LIME KILN MUDDRYER	215.93 tons	28.43 tons	29.57 tons	47.74 tons	165.13 tons	6.39 tons
LINE A- Cl_2 SCRUBBER⁽¹⁾	NA	NA	NA	NA	1.48 tons	NA
LINE A- E_0 WASHER⁽¹⁾	NA	NA	NA	NA	0.16 tons	NA
LINE B- Cl_2 SCRUBBER⁽²⁾	NA	NA	NA	NA	1.48 tons	NA
LINE B- E_0 WASHER⁽²⁾	NA	NA	NA	NA	0.16 tons	NA
TOTAL	356.01 tons	30.60 tons	263.02 tons	59.41 tons	191.76 tons	6.39 tons

(1) Softwood
(2) Hardwood

- Nitrogen Oxides (NO_x)

The NO_x emission factor is based on the vendor guarantee of 200 ppm when firing fuel oil. The projected NO_x emission rate is 49.3 lb/hr. When firing natural gas the vendor guarantees 175 ppm or 43.1 lbs/hr of NO_x.

- Sulfur Dioxide (SO_2)

SO_2 emissions from the Lime Kiln-Mud Dryer originate from several sources in the process. These sources include the lime mud which is fed to the kiln and the combustion of both fuel oil and NCG's. When combined the corresponding potential uncontrolled SO_2 emission rate is 130 lb/hr. The lime calcining process has been shown to remove a substantial portion of potential SO_2 emissions. However, CHAMPION is proposing to utilize a caustic scrubber when necessary to meet the proposed SO_2 emission rate. A scrubber SO_2 removal efficiency of 95% has been assumed for calculating the allowable SO_2 emission rate. The proposed SO_2 emission rate based upon the 95% reduction associated with the scrubber is 6.49 lb/hr.

- Carbon Monoxide (CO)

The CO emission factor is based on the vendor guarantee of 45 ppm. The CO emission rate is 6.75 lb/hr.

- Total Suspended Particulate Matter and Particulate Matter less than 10 microns (PM/PM_{10})

  The PM/PM_{10} emission factor is based upon meeting a grain loading of 0.037 gr/dscf per the vendor guarantee for the new control equipment. The PM/PM_{10} emission rate is 10.90 lb/hr.

- Volatile Organic Compounds (VOC)

  The VOC emission rate is 37.7 lb/hr based on vendor data (160 ppm).

- Total Reduced Sulfur Compounds (TRS)

  The TRS emission factor is based on the vendor guarantee of 8 ppm at 10% O_2. The TRS emission rate is 1.46 lb/hr.

3.3.2 No. 6 Power Boiler

The No. 6 Power Boiler has a design heat input rating of 533 MMBtu/hr. The designated fuel fired in the boiler is natural gas. The emission factors are based upon vendor guarantees except for PM/PM_{10} which is based on AP-42.

- Nitrogen Oxides (NO_x)

  The NO_x emission factor is based on the vendor guarantee of 0.06 lb/MMBtu. The NO_x emission rate is 32.0 lb/hr.

- Sulfur Dioxide (SO_2)

  The SO_2 emission factor is based on the sulfur content of natural gas (Table 1.4-1, utility size boiler). This factor is .00093 lb/MM Btu of natural gas. Assuming a natural gas heating value of 1000 Btu/scf, the sulfur dioxide emission rate is 0.5 lb/hr.

- Carbon Monoxide (CO)

  The CO emission factor is based on the vendor guarantee of 0.1 lb/MMBtu. The CO emission rate is 53.3 lb/hr.

- Total Suspended Particulate Matter and Particulate Matter less than 10 microns (PM/PM_{10})

  The PM/PM_{10} emission factor is based on the AP-42 emission factor for natural gas (Table 1.4-1, Utility Boiler Size). This factor is 5 lb/10^6 cf of natural gas. Assuming a natural gas heating value of 1000 Btu/scf, the PM/PM_{10} emission factor is 0.005 lb/MMBtu. The PM/PM_{10} emission rate is 2.67 lb/hr.

- Volatile Organic Compounds (VOC)

  The VOC emission factor is based on a vendor guarantee of 0.01 lb/MMBtu. The VOC emission rate is 5.33 lb/hr.

3.3.3 Bleach Plant Sources

The total future emission factors are based upon laboratory tests at 100% substitution of chlorine dioxide for molecular chlorine in the Bleach Plant process. These laboratory results were then apportioned between the Bleach Plant sources according to relationships established from the NCASI 1990 test program. A detailed presentation of the methodology used to develop these factors is presented in Appendix D.

3.3.3.1 A-Line Scrubber

- Volatile Organic Compounds (VOC)

  The emission rate is based upon the laboratory test of 100% substitution of chlorine dioxide for molecular chlorine. The VOC emission rate is 0.3375 lb/hr.

3.3.3.2 A-Line E_o Washer

- Volatile Organic Compounds (VOC)

  The emission rate is based upon the laboratory test of 100% substitution of chlorine dioxide for molecular chlorine. The VOC emission rate is 0.0375 lb/hr.

3.3.3.3 B-Line Scrubber

- Volatile Organic Compounds (VOC)

The emission rate is based upon the laboratory test of 100% substitution of chlorine dioxide for molecular chlorine. The VOC emission rate is 0.3375 lb/hr.

3.3.3.4 B-Line E_o Washer

- Volatile Organic Compounds (VOC)

The emission rate is based upon the laboratory test of 100% substitution of chlorine dioxide for molecular chlorine. The VOC emission rate is 0.0375 lb/hr.

SECTION 5

DETERMINATION OF BEST AVAILABLE CONTROL TECHNOLOGY

5.1 BEST AVAILABLE CONTROL TECHNOLOGY

The Clean Air Act, as amended in 1977 and 1990, prescribes several technology-based limitations affecting new or modified sources of air pollutant emissions. One such limitation is that of the New Source Performance Standards (NSPS) set by the United States EPA and adopted by the Florida DER. NSPS require that specific categories of new or modified stationary sources meet uniform national standards for specific pollutants based on the degree of emission limitation achievable through utilization of the best demonstrated technology available at the time of their promulgation.

In addition to the technology-specific requirements, as presented in the NSPS, overall facility emissions of criteria pollutants, of significant quantity, from any pollutant source will be regulated under provisions found in the Prevention of Significant Deterioration (PSD) regulation. The PSD regulation requires that the Best Available Control Technology (BACT) be used to control triggering pollutant emissions. BACT is defined in 40 CFR 52.21 (b)(12) as:

> An emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under the Act which would be emitted from any proposed major stationary source or major modification which the Administrator, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant. In

> no event shall application of best available control technology result in emissions of any pollutant which would exceed the emissions allowed by any applicable standard under 40 CFR Parts 60 and 61. If the Administrator determines that technological or economic limitations on the application of measurement methodology to a particular emissions unit would make the imposition of an emissions standard infeasible, a design, equipment, work practice, operational standard, or combination thereof, may be prescribed instead to satisfy the requirement for the application of BACT. Such standard shall, to the degree possible, set forth the emissions reduction achievable by implementation of such design, equipment, work practice, or operation, and shall provide for compliance by means which achieve equivalent results.

Basically, a BACT determination is a case-by-case analysis that addresses the technological question of whether a proposed control technique can be considered BACT for the particular application or whether a more stringent level of emission control should be used. This determination involves an assessment of the availability of applicable technologies capable of sufficiently reducing a specific pollutant emission, as well as weighing the economic, energy, and environmental impacts of using each technology.

The methodology used in this study to determine BACT follows the "top-down" approach previously recommended by the EPA. However, it should be noted that pursuant to a settlement of litigation between EPA and industry trade groups, the "top-down" BACT requirements are not legally enforceable until established by a formal rulemaking procedure (56 F.R. 34202 26, July 1991). The "top-down" BACT contains the following elements:

- Determination of the most stringent control alternatives potentially available.

- Discussion of the technical and economic feasibility of each alternative.

- Assessment of energy and environmental impacts, including toxic and hazardous pollutant impacts, of feasible alternatives.

- Selection of the most stringent control alternative that is technically and economically feasible and that provides the best overall control of all pollutants.

The selected BACT must be at least as stringent as NSPS and State Implementation Plan limits for the source.

This BACT review is presented for each pollutant emitted in amounts that exceed the PSD significance levels. BACT applies to each emissions unit at which a net emissions increase in the pollutant would occur as a result of a physical change or change in the method of operation in the unit. Therefore, the BACT analysis for the proposed CHAMPION Pensacola mill modifications considers emission controls for nitrogen oxides (NO_x), carbon monoxide (CO), and volatile organic compounds (VOC) from specific sources. A listing of the sources required to undergo a BACT analysis and the PSD affected pollutants is presented below:

- No. 6 Power Boiler
    - Nitrogen Dioxide
    - Carbon Monoxide
    - Volatile Organic Compounds

- Lime Kiln - Mud Dryer
    - Nitrogen Dioxide
    - Carbon Monoxide
    - Volatile Organic Compounds

5.2 BACT ANALYSIS FOR THE NO. 6 POWER BOILER

BACT analyses on the new No. 6 Power Boiler are required for the following PSD affected pollutants: NO_x, CO, and VOC. A review of the BACT/LAER clearinghouse for natural gas fired boilers was conducted and is included in Table 5-1. The clearinghouse entries include boilers with add-on controls as well as boilers utilizing good combustion practice to minimize NO_x, CO and VOC emissions. It is important to note that emissions of these pollutants are interrelated and that combustion modifications which are directed at minimizing one pollutant (e.g., NO_x) can, alternatively, result in an increase in other pollutant emissions (e.g., VOC and/or CO). Therefore, in evaluating BACT for a combustion source without add-on controls, it is important to recognize this relationship and to develop a control strategy that results in a reasonable overall emissions control plan. It is not reasonable to expect that the lowest emission rates reported for each pollutant by any source can be met by the proposed No. 6 Power Boiler.

Based upon the information supplied in the BACT/LAER Clearinghouse and subsequent investigation it appears that none of the listed boilers incorporate add-on controls for CO or VOC. Only one of the sixteen BACT/LAER Clearinghouse entries included in Table 5-1 had add-on controls for nitrogen dioxide emissions (Westinghouse Electric, California). All other sources utilized low NO_x burners and good combustion control to meet the BACT levels identified.

However, in order to follow the "Top Down" BACT analysis procedure, Champion has evaluated add-on controls to determine if such process could be considered BACT for the proposed No. 6 Power Boiler. The applicable technologies are discussed and the cost associated with their application to the proposed No. 6 boiler is included in the following subsections.

TABLE 5-1

BACT/LAER CLEARINGHOUSE
SUMMARY OF NATURAL GAS FIRED BOILERS

FACILITY	DATE PERMIT ISSUED	BOILER HEAT INPUT (MMBtu/hr)	NO_x	CO	VOC
			(LB/MMBtu)		
BAF Energy, CA	10/26/87	150	----[a]	----[a]	----[a]
Hopewell Cogen, VA	07/01/88	197	0.1	0.09	0.005
Kamine Carthage, NY	07/01/88	113	0.10	0.16	0.1
Westinghouse Elect., CA	08/17/88	380	.015[c]	----[a]	----[a]
Kamine South Glens Falls, NY	09/01/88	113	0.10	0.16	0.10
Willamette Ind., Bennettsville, SC	09/29/88	305	0.12 (LAER)	0.04	-----[a]
Boise Cascade, International Falls, MN	05/12/89	#1 373 #2 205	0.05[b] 0.05	0.09 0.09	0.009 0.009
Newsprint South, Genada Ms.	08/08/89 08/08/89	227.4 176.5	0.2 0.2	0.04 0.04	0.0014 0.0014
Dupont, MS	11/28/89	231	0.12	0.065	0.0078
Consolidated Paper, WI	01/26/90	566.5	0.05	0.12	0.0018
Clark County Industrial Council, AR	04/23/90	154.7	0.1	0.04	0.0014
Nekoosa WI Region V	05/09/90	150	0.05	----[a]	-----[a]
Gaylord Cont., Bolyolusa, LA	07/11/90	235	0.12	----[a]	----[a]
Willamette Campti, LA	02/04/91	335	0.12	0.04	0.003
Minn. Corn Processing	06/25/91	178.7	0.125 (24/hr avg.)	----[a]	----[a]
James River, MI	09/17/91	226.7	0.06	0.09	0.025
Champion, Pensacola	NA	533	0.06	0.1	0.01

[a] No data provided for this pollutant.
[b] Visibility impact on Class 1 area.
[c] Lo-NO_x, FGR, SCR

5.2.1 BACT for Nitrogen Oxides

Nitrogen oxides are products of all conventional combustion processes. Nitric oxide (NO) is the predominant form of NO_x emitted by such sources with lesser amounts of nitrogen dioxide (NO_2) and nitrous oxide (N_2O). The NO can further oxidize in the atmosphere to NO_2. The aforementioned nitrogen oxides are referred to collectively as NO_x. The generation of NO_x from fuel combustion is a result of two formation mechanisms. Fuel NO_x is formed by the reaction of chemically bound nitrogen in the fuel and oxygen in the combustion air at high temperature in the combustion zone. Thermal NO_x is produced by the reaction of the molecular nitrogen and oxygen contained in the combustion air at high temperature in the combustion zone. The main factors influencing the NO_x reaction are combustion temperature, residence time within the combustion zone, amount of fuel-bound nitrogen, and oxygen levels present in the combustion zone. Since the No. 6 boiler is fueled with natural gas which is inherently low in fuel-bound nitrogen, only thermal NO_x formation is important.

A number of control techniques have been used to reduce NO_x emissions from combustion processes. Selective catalytic reduction of NO_x by ammonia (NH_3) was identified as the most stringent method of NO_x control for certain combustion processes because of the relatively high removal efficiencies that can be achieved under proper operating conditions. Selective catalytic reduction is an add-on control most commonly used in the United States on gas-fired industrial and utility boilers and combustion turbines. Relatively high NO_x removal efficiencies approaching 90 percent can be obtained with selective catalytic reduction under ideal conditions. Flue gas denitrification (FGDN) is another add-on NO_x control technology that can also approach 90 percent removal efficiency by using a wet scrubbing method.

Selective noncatalytic reduction was the next most stringent control technology identified. It is also an add-on control technology that utilizes ammonia, urea, or other reducing compounds without a catalyst present. Selective noncatalytic reduction is normally capable of attaining NO_x removal efficiencies in the range of 35 to 55 percent.

Combustion modification techniques, such as low NO_x burners, combustion controls, and flue gas recirculation can also be used to reduce NO_x emissions from natural gas firing by limiting thermal NO_x formation. Such techniques limit excess air and reduce peak flame temperatures and are more aptly described as process modifications rather than add-on (post-combustion) controls. The aforementioned technologies are generally capable of reducing NO_x emissions by up to 50 percent compared to a combustion unit without such controls.

5.2.1.1 Selective Catalytic Reduction (SCR)

In the selective catalytic reduction (SCR) process, NO_x is reduced to N_2 and H_2O by ammonia (NH_3) within a temperature range of approximately 540-840°F in the presence of a catalyst, usually a base metal. The lower end of the operating temperature range is feasible when the acid gas impurity level is relatively low. NH_3 has been used as an acceptable reducing agent for NO_x in combustion gases because it selectively reacts with NO_x while other reducing agents such as H_2, CO, and CH_4 also readily react with O_2 in the gases. In a typical configuration, flue gas from the combustion source is passed through a reactor which contains the catalyst bed. Parallel flow catalyst beds may be used in which the combustion exhaust gas flows through channels rather than pores to minimize blinding of the catalyst by particulate matter. Ammonia in vapor phase is injected into the flue gas downstream of the other control equipment that may be required for the particular combustion process for removal of pollutants such as particulate matter and sulfur dioxide. The ammonia is normally injected at a 1:1 molar ratio based upon the NO_x concentration in the flue gas. Major capital equipment for SCR consists of the reactor and catalyst, ammonia storage tanks, and an ammonia injection system using either compressed air or steam as a carrier gas. Because of the toxic characteristics of NH_3, appropriate storage and handling safety features must be provided if anhydrous NH_3 is used. NO_x removal efficiencies approaching 90 percent have been reported when using SCR systems for boiler and gas turbine applications.

Table 5-2 lists the total capital investment for an SCR system based upon information received from Engelhard for treatment of a 13,000 scfm gas stream. Basic equipment cost was then scaled up using the six-tenths factor rule based upon the 105,190 scfm flue gas flow rate from the CHAMPION Power Boiler. Total purchased equipment cost, direct installation costs, and indirect costs were based upon factors given in the U.S. EPA OAQPS Control Cost Manual. Ammonia handling and safety design costs were scaled down from an estimate for a resource recovery facility based upon the facility uncontrolled NO_x emission rates (which are directly proportional to NH_3 consumption rates) and the six-tenths factor rule. Annualized cost information is presented in Table 5-3 based upon direct and indirect operating cost factors given in the OAQPS Control Cost Manual for other types of control equipment. These factors were deemed to be the most appropriate ones to use for SCR system. Operating costs include a cost for natural gas reheat of the boiler exhaust gas from the 350°F discharge temperature to the 540°F lower limit of the SCR operating temperature range. Catalyst replacement cost was based upon a three year life given in the vendor warranty. Cost effectiveness was calculated based upon a NO_x inlet emission rate of 140 tons per year (equivalent to a flue gas concentration of approximately 50 ppmdv) to the SCR system and a vendor estimated removal efficiency of 85.5 percent. A baseline emission rate of 140 tons per year was used (0.06 lb/MM Btu @ 533 MM Btu/hr) since the power boiler is a new unit that is equipped with low NO_x burners and flue gas recirculation.

The calculated cost effectiveness of more than $7,200 per ton of NO_x removed is higher than any guidelines provided by the U.S. EPA.

Table 5-2
Champion- Pensacola Power Boiler
Capital Costs for NOx Control
Engelhard SCR System

Vendor Quote:	1.15	*(A)*		$1,575,519 [(a)]
Purchased Equipment Cost:				
Control device and auxiliary equipment	1.00	*(A)* [(b)]		$1,370,000 *(A)*
Instruments and controls	0.10	*(A)*	x 1.5 (for CEM, feedback)[(c)]	$205,500
Taxes	0.03	*(A)*		$41,100
Freight	0.05	*(A)*		$68,500
Total purchased equipment cost :				$1,685,100 *(B)*
Direct Installation Cost:				
Foundations and supports	0.08	*(B)*		$134,800
Erection and handling	0.14	*(B)*		$235,900
Electrical	0.04	*(B)*		$67,400
Piping	0.02	*(B)*		$33,700
Insulation	0.01	*(B)*		$16,900
Painting	0.01	*(B)*		$16,900
Total direct installation costs:				$505,600
Total direct costs:				$2,190,700
Indirect Costs:				
Engineering and supervision	0.10	*(B)*		$168,500
Construction and field expenses	0.05	*(B)*		$84,300
Construction fee	0.10	*(B)*		$168,500
Startup	0.02	*(B)*		$33,700
Performance test	0.01	*(B)*		$16,900
Contingencies	0.03	*(B)*		$50,600
Total indirect costs:				$522,500
Ammonia Handling & Safety Design Cost [(d)] =	$300,000 x (0.5 x 140.2 tons/year of NOx / 455.2 tons/year of NOx)^0.6 =			$97,600
Total Installed Capital Costs :				$2,810,800

[(a)] *Based on a July, 1990 vendor cost estimate ($450,000 for 13,000 scfm) that includes auxiliary equipment, instruments and controls. Six-tenth factor scaleup was used based on 13,000 scfm quote basis vs. 105,190 scfm power boiler flue gas flow rate. The costs are also scaled to present day figures by utilizing the CE cost index. Sept 1992 CE index= 357.1, 1990 CE index= 357.6.*

[(b)] *Factors in this column taken from U.S. EPA OAQPS Control Cost Manual, EPA 450/3-90-006A, January 1990 for thermal and catalytic incinerators, and carbon adsorbers.*

[(c)] *Multiplier from Capital and Operating Costs of Selected Air Pollution Control Systems, EPA 450/5-80-002, December 1978 (GARD Manual).*

[(d)] *Scaled down from cost estimate for the Pennsauken Resource Recovery Project BACT Assessment for Control of NOx Emissions Top-Down Technology Consideration. Ogden Martin Systems of Pennsauken, Inc., Dec.15, 1988, adjusted to current $ and reflecting half (0.5) of the NH3 consumption of Exxon DeNOx.*

This cost effectiveness value can be compared with EPA's calculated cost effectiveness values associated with the NO_x limitations contained in the NSPS for Industrial Boilers, 40 CFR 60, Subpart Db. These standards promulgated in 1986, considered an incremental cost effectiveness of $4,000/ton unreasonable. Also considered unreasonable was an incremental cost effectiveness of $2,500/ton when switching from residual oil to natural gas. The NSPS for small industrial boilers, subpart Dc,. proposed in 1989, considered a cost of $6,000/ton unreasonable for national NO_x standards.

Hence, based upon the analysis given above, SCR is discounted as BACT for NO_x control on the power boiler.

5.2.1.2 Flue Gas Denitrification (FGDN)

Flue gas denitrification (FGDN) systems use wet scrubbing technology to react absorbed SO_2 with NO_x to form molecular nitrogen and can achieve NO_x removal efficiencies approaching 90 percent. Consequently, FGDN systems are designed for combustion sources that burn relatively high sulfur fuel. However, since the power boiler under consideration is fired with essentially sulfur-free natural gas fuel, there is no source of SO_2 for absorption into the scrubbing liquid. Thus, FGDN is dismissed as BACT for NO_x control on the power boiler because of technical infeasibility.

5.2.1.3 Selective Noncatalytic Reduction (SNCR)

Selective non-catalytic reduction (SNCR) involves ammonia or urea injection, but not in the presence of a catalyst. Two major SNCR systems are commercially available: the Exxon Thermal $DeNO_x$ ammonia injection system and the Nalco Fuel Tech NO_xOUT urea injection system. A third system, the Noell (formerly the Emcotek) Two-Stage $DeNO_x$ urea/methanol injection system, has undergone extensive pilot testing and a full scale demonstration on one MSW incinerator line in Switzerland.

5.2.1.4 Exxon Thermal DeNO$_x$

Exxon Thermal DeNO$_x$ ammonia injection, like SCR, uses the NO$_x$/ammonia reaction to convert NO$_x$ to molecular nitrogen. However, without catalyst use or supplemental hydrogen injection, NO$_x$ reduction reaction temperatures must be tightly controlled between 1,600 and 2,200°F (between 1600 and 1800°F, for higher efficiency). Below 1,600°F and without hydrogen also being injected, ammonia will not fully react, resulting in what is called ammonia breakthrough or slip. If the temperature rises above 1,800°F, a competing reaction begins to predominate:

$$NH_3 + \frac{5}{4} O_2 \longrightarrow NO + \frac{3}{2} H_2O$$

As indicated above, this reaction increases NO emissions. Therefore, the region within the boiler where ammonia is injected must be carefully selected to ensure the optimum reduction reaction temperature will be maintained.

Thermal DeNO$_x$ is an available technology that has been used on gas-fired boilers and gas turbines and commonly achieves NO$_x$ removals up to 50 to 60% within the narrow temperature range noted previously. However, since ammonia is injected at a 2:1 molar ratio based upon the flue gas NO$_x$ concentration, there is generally some "slip" of ammonia which does not react completely and that can potentially cause odors. At the power boiler flue gas flow rate of 105,190 scfm and a "slip" concentration of 20 ppmv, ammonia emissions could amount to 24 tons per year. The potential ammonia "slip" concentration of 20 ppmv is almost one-half the uncontrolled NO$_x$ concentration of 50 ppmv.

Tables 5-4 and 5-5 summarize capital costs and annualized costs respectively, for an Exxon Thermal DeNO$_x$ SNCR system installed on the CHAMPION boiler. It was assumed that the ammonia injection would occur within the boiler configuration at a point where the combustion gases are maintained in a temperature range of 1,600 to 1,800°F. Table 5-4 details the total capital investment for an Exxon Thermal DeNO$_x$ system based upon information given in an Exxon study that evaluates the technology. Basic equipment cost was derived from direct cost information provided by Exxon for treatment of a 77,800 scfm flue gas stream. The Exxon direct cost information was scaled up using the six-tenths factor rule based upon the 105,190 scfm flue gas flow rate from the CHAMPION Power Boiler. Then total purchased equipment cost, direct installation costs, and indirect costs were based upon factors given in the OAQPS Control Cost Manual for other types of control equipment as indicated in Table 5-4. As with the SCR capital cost analysis, anhydrous ammonia handling safety design costs were scaled down from an estimate for a resource recovery facility based upon the facility uncontrolled NO$_x$ emission rates and the six-tenths factor rule.

Annualized cost information is presented in Table 5-5 based upon direct and indirect operating cost factors as suggested in the OAQPS Control Cost Manual. Compressed air was assumed to be the NH$_3$ carrier gas although steam could also be used. Premised upon a baseline NO$_x$ emission rate of 140 tons per year, cost effectiveness was based on an expected NO$_x$ removal efficiency of 50%. The cost effectiveness for 50% removal efficiency is $5,570 per ton of NO$_x$ removed.

Having accounted for economic and energy considerations in the cost analysis above, it can be seen that Exxon Thermal DeNO$_x$ is not cost effective based upon the same reasoning given in the previous discussion for SCR. Also noteworthy is the fact that this economic analysis represents a "best case" condition. The economic analysis was preformed using the six-tenths factor scaling rule due to a lack of final design data for the proposed power boiler.

Table 5-4
Capital Costs for Exxon Thermal DeNOx
Champion- Pensacola

				Included in Exxon cost	
Volumetric Flow Rate, acfm					161,000
Purchased Equipment Cost:					
Control device and auxillary equipment (tank, vaporizer, etc)		(provided by Exxon)		1 0	$183,200 *(A)*[a]
Instruments and controls	0.10 *(A)*	x	1.5 (CEM, feedback)	0 1	$27,500
Taxes	0.03 *(A)*			---	$5,500
Freight	0 08 *(A)*			---	$14,700
Total purchased equipment cost :				1.1 *(A)*	$230,900 *(B)*
Direct Installation Cost:					
Foundations and supports	0.06 *(B)*	(venturi scrubber, incinerator)		0.06 *(B)*	$13,900
Erection and handling	0 40 *(B)*	(absorber)		0.40 *(B)*	$92,400
Electrical	0.04 *(B)*	(incinerator, adsorber)		0.04 *(B)*	$9,200
Piping	0.03 *(B)*	(adsorber, incinerator)		0.03 *(B)*	$6,900
Insulation	0.01 *(B)*	(absorber/adsorber)		0.01 *(B)*	$2,300
Painting	0.01 *(B)*	(absorber/adsorber)		0.01 *(B)*	$2,300
Total direct installation costs:				0.55 *(B)*	$127,000
Total direct costs:					$357,900
Indirect Costs:	$324,300 (per Exxon quote)				$324,300 [b]
Engineering and supervision	0.10 (B)	(all except ESP)		Exxon Estimate	.....
Exxon engineering					.....
Construction and field expenses	0.10 *(B)*	(absorber, venturi scrubber)			.....
Construction fee	0.10 *(B)*				.....
Startup	0.01 *(B)*	(absorber, venturi scrubber)			$2,300
Performance test	0.01 *(B)*				$2,300
Contingencies	0.03 *(B)*	x	5 (efficiency guarantee)		.....
Total indirect costs:					$328,900
Total installed capital costs :					$686,800
Exxon Licensing Fee:	(per Exxon quote)				$80,000

[a] *Installed equipment cost (euipment + field labor)*[b]*: (* *\$192,200 +* *\$120,100*) = 0.55(B) + 1.10(A) = 0.55(1.100(A)) + 1.10(A) = \$312,300
solving for A : 312300 /(1.10 x 0.55 + 1.10) = *\$183,200*

[b] *These values are scaled up using the six-tenths factor rule..*

Table 5-5
Annualized Costs for Exxon Thermal DeNOx
Champion- Pensacola

Cost item	Computation method	Cost, dollars	
Direct operating costs			
Operating Labor			
Operator	$15.97 /hr x 3 hrs/shift x 3 shifts/day x 365 days/yr	$52,460	
Supervision	15% of operator labor cost	$7,870	
Operating materials	As required, (0.0% of total installed capital costs)	$0	
Maintenance (general)			
Labor	$15.97 /hr x 1 hr/shift x 3 shifts/day x 365 days/yr	$17,490	
Materials	100% of maintenance labor	$17,490	
Replacement parts			
Materials	As required, (2.0% of total installed capital costs)	$13,740	
Labor	100% of replacement materials	$13,740	
Utilities			
Electricity	$0.042 /kWh x 10,193 kWh/yr	$430	
Steam	$4.130 /M lb x 11,213 M lb/yr	$46,310	
Ammonia	$350.000 /ton x 33.1 ton/yr	$11,600	
Total Direct Operating Costs (A)	Subtotal of above		$181,130 (A)
Indirect operating (fixed) costs			
Overhead	60% of operating and maintenance labor and materials, $95,310	$57,190	
Property Tax	1% of total installed capital costs, $686,800	$6,870	
Insurance	1% of total installed capital costs, $686,800	$6,870	
Administration	2% of total installed capital costs, $686,800	$13,740	
Capital Recovery	CRF, 0.1627 x (total installed capital costs + licensing fee) (at 10% interest and 10 years)	$124,790	
Total Fixed Costs (B)	Subtotal of above		$209,460 (B)
Total Annualized Costs (C)	(A+B)		$390,590 (C)

Tons Of NOx Emitted: *140.2*

Cost Effectiveness At Emission Reduction, $/Ton Of NOx Reduced

50% = *$5,570*

The vendor relayed a serious concern regarding the feasibility of this application on the proposed boiler. This concern is based upon the fact that the inlet loading of 140 tons per year or approximately 50 ppmvd is a very low value and with this low load condition it is extremely difficult to achieve proper mixing. This leads to limited NO_x reduction without increased ammonia injection rates and the associated higher reagent costs. Furthermore, the comparatively low baseline NO_x emission rate of 140 tons per year would yield only a 70 ton per year decrease in NO_x emissions at a removal efficiency of 50 percent while potentially creating 24 tons per year of NH_3 emissions. Therefore, Exxon Thermal $DeNO_x$ is not viable as BACT for the CHAMPION Power Boiler.

5.2.1.5 Nalco Fuel Tech NO_xOut

The Electric Power Research Institute (EPRI) discovered and patented the chemical process of using urea ($CO(NH_2)_2$) to convert nitrogen oxides to nitrogen and water. This process of urea injection has been further developed and is being marketed by Nalco Fuel Tech, Inc. as the NO_xOUT process. In routine applications, liquid urea and proprietary enhancers (oxygenated hydrocarbons) are mixed with water and pumped into the flue gas as an aqueous solution. Atomization at injection nozzles is assisted by auxiliary compressed air or steam, similarly to the Exxon Thermal $DeNO_x$ process. The NO_xOUT process is based on the following chemical reaction:

$$CO(NH_2)_2 + 2\,NO + \frac{1}{2}O_2 \longrightarrow 2N_2 + CO_2 + 2H_2O$$

In the above reaction, one mole of urea is required to react with two moles of NO (i.e., a stoichiometric ratio of 0.5:1). In order to achieve a desired level of removal, greater than stoichiometric quantities of urea must be injected. Manufacturer guidance indicates that a molar ratio of 0.75 - 1 :1 (urea to NO_x) is normally required.

The reaction is temperature dependent. Urea injected alone has a high NO_x reduction activity between 1700 and 1900°F. With process enhancers and adjusted concentrations, the NO_xOUT process is effective from 1500° to 2100°F. Enhancers alone are used between 1000 and 1500°F. A 50% urea solution is typical but solutions as low as 10% may be used. In order to optimize NO_x reduction, different urea and chemical enhancer solutions may be injected at different temperature levels.

The urea (in storage and process piping) must be kept above 70°F to avoid crystallization. Recirculation pumps are also used to prevent crystallization.

NO_xOUT technology is applicable to certain types of stationary combustion equipment. As with Thermal DeNO_x, NO_x removal efficiencies will vary depending on the combustion equipment and system configuration. Performance is based on placement of injectors and sufficient mixing of flue gases within the specified temperature range. The NO_xOUT process is generally deemed impractical for application to NO_x sources with large load variations and also to gas turbines.

The capital equipment required for the NO_xOUT process is similar to that required for Exxon Thermal DeNO_x and includes the following:

- Liquid urea storage tank.
- Feed system (pumps, controllers).
- Process monitoring equipment.
- Atomization assist system (steam or air).
- Process piping (pipes, nozzles, mixer).

Tables 5-6 and 5-7 summarize the capital costs and annualized costs respectively, for the NO_xOUT system. It was also assumed for the system that the urea injection would occur within the boiler configuration at a point where the combustion gases are maintained in a

Table 5-6
Capital Costs for NALCO/Fuel Tech NOxOUT
Champion- Pensacola

				Included in Fuel Tech cost	
Volumetric Flow Rate, acfm					161,000
Installed Costs: From NALCO/Fuel Tech -		Equipment & Services & Licensing Fee=	$470,000		
		Installation =	$75,000		
			$545,000		$545,000
Purchased Equipment Cost:					
Control device and auxiliary equipment (tank, vaporizer, etc)				1.0	$267,700 *(A)*[a]
Instruments and controls	0.10 *(A)*	x 1.5 (CEM, feedback)		0.1	$40,155
Taxes	0.03 *(A)*			---	$8,000
Freight	0.08 *(A)*			---	$21,400
Total purchased equipment cost :				1.10 *(A)*	$337,255 *(B)*
Direct Installation Cost:					
Foundations and supports	0.06 *(B)*	(venturi scrubber, incinerator)		---	$20,200
Erection and handling	0.40 *(B)*	(absorber)		0.40 *(B)*	$134,900
Electrical	0.04 *(B)*	(incinerator, adsorber)		0.04 *(B)*	$13,500
Piping	0.03 *(B)*	(adsorber, incinerator)		0.03 *(B)*	$10,100
Insulation	0.01 *(B)*	(absorber/adsorber)		0.01 *(B)*	$3,400
Painting	0.01 *(B)*	(absorber/adsorber)		0.01 *(B)*	$3,400
Total direct installation costs:				0.49 *(B)*	$185,500
Total direct costs:				1.49 *(B)*	$522,755
Indirect Costs:					
Engineering and supervision	0.10 *(B)*	(all except ESP)		---	$33,700
Fuel Tech process design		(363800 - 267700)		---	$96,100
Construction and field expenses	0.10 *(B)*	(absorber, venturi scrubber)		---	$33,700
Construction fee	0.10 *(B)*			---	$33,700
Startup		*(per NALCO/Fuel Tech quote)*[b]		---	$31,200
Performance test	0.01 *(B)*			---	$3,400
Contingencies	0.03 *(B)*	x 5 (efficiency guarantee)		---	$50,600
Total indirect costs:				0.00	$282,400
Total installed capital costs :				1.49 (B)	$805,155
NALCO/Fuel Tech Licensing Fee (per NALCO/Fuel Tech estimate)[c]:					$0

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[a] *Total installed cost minus the start-up and licensing fee*[c]*: ($363,800 + $75,000) = 1.49(B) = 1.49(1.100(A)) = $438,800*
solving for A : 438800 /(1.100 x 1.49) = $267,700

[b] *These values are scaled up using the six-tenths factor rule..*

[c] *A licensing fee of $75,000 was assumed from a previous cost estimate.*

Table 5-7
Annualized Costs for NALCO/Fuel Tech NOxOUT System
Champion- Pensacola

Cost item	Computation method		Cost, dollars	
Direct operating costs				
Operating Labor				
Operator	$15.97 /hr x 3 workers x 3 working hrs/day x 365 days/yr		$52,460	
Supervision	15% of operator labor cost		$7,870	
Operating materials	As required, (0.0% of total installed capital costs)		$0	
Maintenance (general)				
Labor	$15.97 /hr x 1 workers x 3 working hrs/day x 365 days/yr		$17,490	
Materials	100% of maintenance labor		$17,490	
Replacement parts				
Materials	As required, (2.0% of total installed capital costs)		$16,100	
Labor	100% of replacement materials		$16,100	
Utilities				
Electricity (including comp. air)	0.042 /kWh x 102,674 kWh/yr		$4,310	
Urea (plus additive A)	0.800 /gal x 79,144 gal/yr		$63,320	
Total Direct Operating Costs (A)	Subtotal of above			$195,140 (A)
Indirect operating (fixed) costs				
Overhead	80% of operating and maintenance labor and materials,	$95,310	$76,250	
Property Tax	1% of total installed capital costs,	$805,160	$8,050	
Insurance	1% of total installed capital costs,	$805,160	$8,050	
Administration	2% of total installed capital costs,	$805,160	$16,100	
Capital Recovery	CRF, 0.1627 x (total installed capital costs + licensing fee) (at 10% interest and 10 years)		$131,035	
Total Fixed Costs (B)	Subtotal of above			$239,490 (B)
Total Annualized Costs (C)	(A+B)			$434,630 (C)

Tons Of Nox Emitted:	*140.2*

Cost Effectiveness At Emission Reduction, $/Ton Of NOx Reduced

50% = *$6,200*

temperature range of 1700 - 1900°F. Equipment cost was derived from direct cost information provided by Nalco Fuel Tech for treatment of the 105,190 scfm flue gas flow from the CHAMPION Power Boiler. The factors in the OAQPS Control Cost Manual were once again the basis for total purchased equipment cost, direct installation costs, and indirect costs.

Annualized cost information, presented in Table 5-7, is based upon direct and indirect operating cost factors as suggested in the OAQPS Control Cost Manual. The NO_x emission rate of 140 tpy and an expected NO_x removal efficiency of 50% resulted in a cost effectiveness of $6,200 per calculated ton of NO_x removed, slightly higher than that calculated for Exxon Thermal $DeNO_x$.

The economic analysis demonstrates the Nalco Fuel Tech NO_xOUT System is not cost effective based upon similar prior reasoning. In addition NH_3 slip also occurs due to the decomposition of urea. Hence, NO_xOUT is ruled out as BACT for the CHAMPION Power Boiler.

5.2.1.6 Noell Two-Stage $DeNO_x$

Noell has developed and patented the Two-Stage $DeNO_x$ process, which utilizes both urea and methanol injection. Noell's initial pilot studies on a 1 MW crude oil boiler used methanol alone to remove NO_x. The final patent involves injection of both urea and methanol through proprietary nozzle designs. In this design the primary function of the methanol is to reduce ammonia slip and air preheater deposits. Emcotek is currently marketing this technology.

The Two-Stage DeNO$_x$ system utilizes two zones of chemical injection. Bulk granular urea is mixed with water prior to injection in the first zone. Liquid methanol is injected in the second zone. The flowrates of the chemicals to the various injection zones are controlled by a sensor for flue gas temperature (or other surrogate measure determined during pilot/start-up testing).

At the present stage of development, the Noell Two-stage DeNO$_x$ system is not considered to be available control technology or technology transfer that could be installed on the power boiler. Furthermore, if it were available and technically feasible at this juncture, it would likely be even less cost effective than Thermal DeNO$_x$ or NO$_x$OUT. Hence, Noell Two-Stage DeNO$_x$ is not BACT.

5.2.1.7 Selected NO$_x$ BACT - Combustion Technology

As previously discussed, thermal NO$_x$ formation is related to combustion conditions such as excess air, operating temperature, and residence time. The previously discussed NO$_x$ add-on control technologies remove NO$_x$ after it has been formed. Combustion technology utilizes integral methods of minimizing NO$_x$ formation during the combustion process. Combustion design strategies that limit NO$_x$ emissions include reducing the available oxygen at critical stages in the combustion zone, lowering the peak flame temperature, and reducing the residence time during which nitrogen is oxidized. Burner venders and boiler manufacturers have made substantial improvements in recent years at minimizing NO$_x$ formation through new burner technology and flue gas recirculation methods. In addition, combustion parameters can now be carefully controlled by automatic systems to maintain combustion within the operating range that will minimize NO$_x$ production.

The CHAMPION Power Boiler incorporates combustion design and control to minimize NO$_x$ emissions. The Coen burners together with the integral flue gas recirculation to the combustion zone results in efficient combustion at excess air levels equivalent to 2.0 - 3.0

percent oxygen levels in the flue gas. The combined design and control of the combustion system results in a NO_x emission rate guaranteed by the vendor not to exceed 0.06 lb/MM Btu.

CHAMPION believes that boiler design and combustion control to meet a NO_x emission rate of 0.06 lb/MMBtu represents BACT for NO_x control for the following reasons:

- Low NO_x emissions can be achieved without creating additional adverse impacts such as emissions of ammonia which occur with the previously discussed add-on controls such as SCR and SNCR.

- The projected NO_x emissions represent the low range of recently permitted levels for many other combustion sources. In fact, the proposed NO_x emission rate of 0.06 lb/MMBtu is in line with other natural gas-fired boilers listed in the BACT/LAER Clearinghouse Database.

- There are no available add-on controls which are cost effective.

5.2.2 BACT for Carbon Monoxide (CO) and Volatile Organic Compounds (VOC)

As previously noted in Section 5.2, when conducting a BACT analysis for CO and VOC it is imperative to consider the interrelationship of the pollutants most affected by combustion conditions: NO_x, CO, and VOC. Table 5-1 is a summary table of NO_x, CO, and VOC emission limits from the BACT/LAER Clearinghouse for large gas-fired boilers. The table includes CHAMPION's proposed limits for comparison with the other determinations made to date. Based upon the Clearinghouse data it does not appear that any of the listed units incorporate add-on control technology for CO or VOC.

A review of the BACT/LAER summary data supports the concern over the interrelationship of the combustion related contaminants. For all of the units identified in the Clearinghouse only one facility, Boise Cascade in International Falls, Minnesota, has identified lower emission rates for all three pollutants than those proposed for CHAMPION's No. 6 Power Boiler. However the proposed Boise Cascade limits are consistent with and only slightly lower than the limits proposed by CHAMPION for each pollutant.

For all of the other facilities in the Clearinghouse with identified NO_x, CO and VOC limits, those with both lower CO and VOC values had considerably higher NO_x limits. CHAMPION believes, therefore based upon review of Clearinghouse listed sources, that the proposed limits for both CO and VOC in conjunction with good combustion practices and process control to achieve these levels and along with the proposed NO_x level represents BACT for the No.6 Power Boiler.

5.3 BACT FOR THE LIME KILN-MUD DRYER

BACT analyses for the Lime Kiln-Mud Dryer were conducted for the following PSD significant pollutants: NO_x, CO, and VOC.

5.3.1 BACT for Nitrogen Oxides

CHAMPION proceeded with the BACT analysis by determining the applicability of NO_x control systems to Lime Kiln-Mud Dryer operations. Vendors of both SCR and SNCR control systems were contacted.

5.3.1.1 Selective Catalytic Reduction (SCR)

The SCR technology has been previously detailed in Subsection 5.2.1.1. The applicability of SCR to the Lime Kiln-Mud Dryer operations was examined. Due to the nature of the kiln process, catalyst poisoning would be a concern with a Lime Kiln. The catalysts are sensitive to particulate matter and, thus, must follow the particulate controls. As a result, the flue gas stream discharged from a particulate control device would no longer be at the optimal reaction temperature. Therefore, substantial energy costs would be incurred for flue gas reheat prior to NO_x removal. In addition, the catalysts generally suffer degradation in activity from exposure to acid gases. Since the Lime Kiln-Mud Dryer incinerates TRS compounds to form SO_2, this would be another concern. Discussions with catalyst system vendors indicate that, due to the nature of the process and resulting exhaust gas composition, they would not recommend the application of SCR to the Lime Kiln-Mud Dryer. Furthermore, it should be noted that SCR has never been installed on any lime kiln. Therefore, SCR is not considered to be an available NO_x control technology for lime kilns and thus not an available NO_x control technology for CHAMPION's proposed Lime Kiln-Mud Dryer which is a technically more complex process than a typical kraft mill lime kiln.

5.3.1.2 Selective Noncatalytic Reduction (SNCR)

Ammonia Injection

The technology associated with SNCR, usually exemplified by the Exxon Thermal $DeNO_x$ process, involves ammonia injection and has been presented in Subsection 5.2.1.4. Thermal $DeNO_x$ is an available technology that has been used on natural gas, oil-fired boilers and gas turbines. Thermal $DeNO_x$ has never been applied to a lime kiln. The requisite temperatures for the reaction to occur would be located within the kiln. The effect of injection of ammonia on CHAMPION's critical Lime Kiln-Mud Dryer production process has not been investigated. It is likely that formation of ammonium sulfate or bisulfate salts is likely and would result in quality control problems due to contamination of the lime.

Because the effect of this control technique on the Lime Kiln-Mud Dryer process is unknown and the ability to reduce NO_x emissions to a greater degree than existing lime kiln NO_x control techniques is unproven, Thermal $DeNO_x$ is not considered to be an available control technology for CHAMPION's Lime Kiln-Mud Dryer.

Urea Injection

NO_xOUT technology, discussed previously in Subsection 5.2.1.5, is applicable to certain types of stationary combustion equipment. Similarly to Thermal $DeNO_x$, NO_x removal efficiencies will vary depending on the combustion equipment and system configuration. Performance is based on placement of injectors and sufficient mixing of flue gases within the specified temperature range. The NO_xOUT process is generally deemed impractical for application to NO_x sources with large load variations.

As with Thermal $DeNO_x$, the NO_xOUT process has never been applied to a kraft mill lime kiln. The effect on the chemical recovery process occurring within the kiln is unknown and the NO_x removal efficiency is unproven. Therefore, for reasons similar to those presented for Thermal $DeNO_x$, the NO_xOUT process can not be considered BACT for CHAMPION's Lime Kiln-Mud Dryer.

5.3.1.3 Combustion Technology

CHAMPION examined the BACT/LAER Clearinghouse for existing lime kiln determinations. A summary of this information is presented in Table 5-8. Also included in Table 5-8 are CHAMPION'S Proposed Lime Kiln-Mud Dryer limits. CHAMPION proposes a NO_x limit of 49.3 lb/hr based upon a NO_x concentration of 200 ppm at 10% O_2. Based upon the lime production capacity of the unit (up to 500 TPD of lime), CHAMPION believes the proposed NO_x emission rate of 49.3 lb/hr is BACT.

TABLE 5-8
CHAMPION PAPER
PENSACOLA, FLA

BACT/LAER CLEARINGHOUSE
SUMMARY OF LIME KILNS

FACILITY	LOCATION	THROUGHPUT	NO_x	CO	VOC
CHAMPION	COURTLAND, AL	300 TPD CaO	175 ppmv @ 10% O_2, 29 lb/hr	200 ppmv @ 10% O_2, 20.8 lb/hr	31 ppmv @ 10% O_2, 9 lb/hr
ALABAMA RIVER PULP CO	PURDUE HILL AL	465 TPD CaO	100 ppmv @ 10% O_2, 30.1 lb/hr	52 ppmv @ 10% O_2, 9.5 lb/hr	78 ppmv @ 10% O_2
JAMES RIVER	PENNINGTON AL	500 TPD CaO	175 ppmv @ 10% O_2, 56.8 lb/hr	---	--
NEKOOSA PAPERS, INC	ASHDOWN, AR	440 TPD LIME	66.5 lb/hr	55 lb/hr	
WILLAMETTE INDUSTRIES INC	CAMPTI LA	430 TPD CaO, 1740 TADP	51.5 lb/hr, 224 TPY	7 lb/hr, 30.6 TPY	17.2 lb/hr, 75.3 TPY
BOISE CASCADE	RUMFORD, ME	327 TPD PRODUCT	52 lb/hr	39 lb/hr	2 lb/hr
BOISE CASCADE	INTERNATIONAL FALLS, MN	500 TPD	42.5 lb/hr, 220 ppm	23.7 lb/hr, 240 ppm	11.4 lb/hr, 185 ppm
WEYERHAEUSER CO	COLUMBUS, MS	21 TPH	300 ppmv @ 3.6% O_2, 60.9 lb/hr	11 lb/metric TADP, 550 lb/hr	1 lb/T CaO, 21 lb/hr
WILLAMETTE INDUSTRIES	BENNETTSVILLE,SC	220 TPD CaO	35 lb/hr	3.5 lb/hr	8.8 lb/hr
UNION CAMP	SOUTH CAROLINA	265 TPD CaO$^{(3)}$	0.85 lb/MMBtu	0.1 lb/ T ADP	1.6 LB/T CaO
JAMES RIVER	CAMAS, WA$^{(6)}$	--	234 TPY	1798 TPY	45 TPY
CHAMPION	PENSACOLA, FL	500 TPD CaO	200 ppmv @ 10% O_2, 49.3 lb/hr	45 ppmv @ 10% O_2, 6.75 lb/hr	160 ppm, 37.7 lb/hr

(1) Low sulfur fuel.
(2) Caustic scrubber with 97% efficiency.
(3) Based on #6 oil with 2.5% sulfur.
(4) Process controls
(5) Chemical reaction with lime.
(6) Source was rebuilt and not PSD. Venturi scrubber is applied to the source.

5.3.2 BACT for Carbon Monoxide (CO) and Volatile Organic Compounds (VOC)

CHAMPION also performed a BACT/LAER Clearinghouse search for kraft mill lime kiln CO and VOC entries. A summary of this search has been presented in Table 5-8. Comparison of the proposed CHAMPION Lime Kiln-Mud Dryer with the Clearinghouse entries shows CHAMPION's limits to be consistent with previously permitted PSD sources. The Clearinghouse entries present a wide range of limits for both CO and VOC. This can be attributed to different operating conditions and fuel sources at each facility. CHAMPION has examined their potential fuel usage scenarios. CHAMPION's potential Lime Kiln-Mud Dryer combustibles include NCG's, lime mud, and No. 6 fuel oil or natural gas. CHAMPION considered these varying scenarios in the development of the proposed limits. It is important to note that no sources in the BACT/LAER Clearinghouse included add-on controls for CO or VOC emissions from Lime Kilns or Lime Kiln-Mud dryers.

CHAMPION examined the possibilities of applying add-on catalytic oxidation control technology to the Lime Kiln-Mud Dryer as the most stringent technique to control both CO and VOC. Once again, due to the nature of the process, catalyst poisoning would be a potential problem. The catalysts are sensitive to particulate matter and, thus, must follow the particulate control device. As a result, the flue gas stream would no longer be at the optimal reaction temperature - usually ~500°F for CO and ~1000°F for VOC. Therefore, substantial energy costs would be incurred for flue gas reheat prior to CO or VOC removal. Also, acid gases adversely affect the catalysts and can lead to poisoning even if the particulate matter concentration is sufficiently controlled.

An additional consideration regarding catalytic oxidation for control of VOC, is the composition of the VOC in the flue gas. In the case of CHAMPION's Lime Kiln-Mud Dryer, substantially all of the VOC emitted are saturated organic compounds, e.g., organic sulfur compounds and aliphatic compounds. Oxidation catalyst vendors recommend large catalyst volumes and flue gas temperatures in excess of 1,000°F to achieve significant reductions of saturated VOC.

Based on the technical problems associated add-on controls and the fact that no such controls have been applied to similar sources CHAMPION believes that good combustion control and the emission rates proposed represent BACT for the Lime Kiln-Mud Dryer.

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Champion
Champion International Corporation

RECEIVED
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Division of Air
Resources Management

November 12, 1992

Mr. Bruce Mitchell
State of Florida
Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Dear Mr. Mitchell:

We appreciated the opportunity to meet with you and the other FDER staff members last Thursday. As we discussed at that meeting, I am leaving Champion for another job in another state. Kyle Moore will be assuming the air permitting coordination responsibility for Champion. I appreciate the professional approach that the Department has taken in previous permitting, and I appreciate your professional objectivity. I have enjoyed working with you over the past several years, and I am confident that with you as the permit engineer, the project can be permitted on time.

During last week's meeting we reviewed with you Champion's proposed approach for obtaining a PSD permit for the necessary mill modifications. Several key issues were raised relative to VOC emissions and you requested that we supply you with available test data. This letter is intended to briefly review these issues and to convey to you the requested data.

Based upon the projected emissions for the mill sources which are to be modified, it appears that the project will be PSD significant for VOC's. The basis for the significant net VOC increase is the comparison of baseline actual to future potential to emit for several of the modified combustion units. However, as we explained to you during the meeting, the mill's bleach plant will also be modified as part of the project. While the oxygen delignification system is not being modified, if the proposed improvements in the digester cooking process prove effective, improved delignification and less fiber degradation could lead to a slight increase (on the order of 1% to 2%) in the fiber processed through the oxygen delignification system.

As we explained to you during the meeting, very limited data is presently available for VOC emissions from these sources. However, for the bleach plant, a good data base is available for chloroform emissions including testing performed by the National Council of the Paper Industry for Air and Stream Improvement (NCASI) at the mill in 1990. The proposed Pensacola mill bleach plant modification entails 100% substitution of chlorine dioxide for molecular chlorine and is predicted to result in a 90% or greater reduction in the chloroform generation rate and subsequent emissions.

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1 [redacted]
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Your Phone Number (Very Important): (904-)968-2121
Company: MPTON INTERNATIONAL
Department/Floor No.
Street Address: 375 MUSCOGEE RD
City: CANTONMENT State: FL ZIP Required: 3 2 5 3 3

2 To (Recipient's Name) Please Print: BRUCE MITCHELL
Recipient's Phone Number (Very Important): (   )
Company: FLA. DEPT. OF ENVIRONMENTAL REGULATION
Department/Floor No
Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes): 2600 Blair Stone Road
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4 SERVICES (Check only one box)

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Standard Overnight (Delivery by next business afternoon†)
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Economy Two-Day (Delivery by second business day†)
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41 ☐ GOVT PACKAGE

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*Declared Value Limit $100
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8 ☐
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10 ☐
11 ☐ DESCRIPTION
12 ☐ HOLIDAY DELIVERY (if offered) (Extra charge)

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Total	Total	Total

DIM SHIPMENT (Chargeable Weight)
☐ ________ lbs
L x W x H = ____

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4 ☐ BSC
2 ☐ On-Call Stop 5 ☐ Station

Emp No Date
☐ Cash Received
☐ Return Shipment
☐ Third Party ☐ Chg To Del ☐ Chg To Hold
Street Address
City State Zip
Received By:
X
Date/Time Received FedEx Employee Number

7 Release Signature ________
FedEx Emp. No. Date/Time

Federal Express Use
Base Charges
Declared Value Charge
Other 1
Other 2
Total Charges

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As you are aware, EPA is presently developing standard test methods and will be conducting extensive testing to identify and quantify VOC and hazardous air pollutant (HAP) emissions from pulp mill processes including bleach plants. This effort is intended to support the development over the next several years of industry MACT standards. However, there is presently no data available which Champion can use to comfortably identify either baseline or future VOC emissions from the Pensacola bleaching process other than the chloroform data.

Attachment 1 to this letter includes several summary tables from the NCASI chloroform test report for the 1990 Pensacola test. Table 1 summarizes the average chloroform generation rates under existing conditions on a pounds of chloroform per air dried ton of bleached pulp (ADBTP) basis. The total generation rate at a liquid phase pH of 10.5 amount to approximately 0.4 pounds of chloroform per ADBTP. Tables B-1 and B-2 are the actual summary tables for the gas phase chloroform emissions measured from the softwood and hardwood bleach lines respectively. As discussed at our meeting, Champion proposes to use chloroform as a surrogate for total VOC emissions from the bleach plant for the purposes of this application. Based upon the NCASI data and the predicted decrease in chloroform generation resulting from 100% chlorine dioxide substitution, the overall chloroform emission reduction is predicted to be on the order of 90 tons per year.

For the oxygen delignification process, available VOC emission data is extremely limited. Harmon Engineering conducted test in November 1988 on three of the system vents on both the softwood and hardwood lines. A summary of the results of these tests are included in Attachment 2. The VOC emissions ranged from 0.01 pounds per hour up to 0.84 pounds per hour for individual vents. The U.S. EPA also conducted VOC testing at the mill in April 1992. The draft report is under review and final results will not be available for several months.

Based on the limited available data, a 2% increase in fiber throughput for the oxygen delignification process should result in a minimal increase in VOC emissions. The variability in the available test data suggests that the actual difference in VOC concentration would likely not be measurable using the available test methods.

In light of the variability and uncertainty of the test data, Champion is very concerned about attempting to identify and commit to a projected future VOC emission rate from the oxygen delignification process. Therefore, Champion requests that the FDER consider our PSD permit application to be complete without the inclusion of specific baseline and future VOC emission rates for the oxygen delignification system.

Champion will commit to testing these sources following the mill modifications to clearly identify future emission rates. Champion also understands that FDER will include a reopener clause in the permit if the proposed approach is considered acceptable. We therefore ask that you review the attached data and advise us of your opinion as to the acceptability of the proposed approach. As you are aware, the schedule for our project is driven by the waste water consent order. Therefore, the implications associated with the acceptability of our proposed approach are critical for meeting project schedule deadlines.

We appreciate your attention to these important issues. If you have any question regarding the attached data or require additional information, please contact Kyle Moore at (904) 968-4253, or Steve Webb at (904) 968-2121 extension 2499.

Sincerely,

David T. Arceneaux
Permit Coordinator

DTA:sa

cc: Clair Fancy
John Brown
Charles Ayer
Kyle Moore
Steve Webb

Champion International Corporation - Pensacola Mill
VOC test results - pine oxygen delignification system
Testing preformed by Harmon Engineering Associates, Inc., November 1988

Pine Blowtank Vent

Condition	Temp oF	fps	H20 %	acfm	sdcfm	VOC ppm	VOC lb/hr	Avg. Pulp TPH
Condensate*								
run 1	130	<10	15.1	<1400	<1000	13.8	0.08	30.6
run 2	133		16.3			27.5	0.16	
run 3	137		18.1			24.0	0.14	
Fresh water								
run 1	161	<10	33.0	<1400	<1000	149	0.84	30.6
run 2	163		34.6			132	0.74	
run 3	156		29.3			101	0.57	

Pine Filtrate Tank Vent

Condition	Temp oF	fps	H20 %	acfm	sdcfm	VOC ppm	VOC lb/hr	Avg. Pulp TPH
Condensate*								
run 1	147	23.5	23.7	1849	1209	12.3	0.08	30.6
run 2	146	23.5	22.7	1843	1223	7.0	0.05	
run 3	148	24.2	24	1901	1237	4.5	0.03	
Fresh water								
run 1	147	14.0	23.5	1100	719	3.4	0.01	30.6
run 2	148	14.0	24.1	1103	714	10.3	0.04	
run 3	149	14.7	24.7	1155	741	5.4	0.02	

Pine Post Oxygen Washer Hood Vent

Condition	Temp oF	fps	H20 %	acfm	sdcfm	VOC ppm	VOC lb/hr	Avg. Pulp TPH
Condensate*								
run 1	108	48.9	8.0	13008	11193	5.0	0.32	30.6
run 2	111	40.3	8.9	10709	9069	4.3	0.22	
run 3	136	53.5	17.4	14228	10479	2.8	0.16	
Fresh water								
run 1	127	40.7	14.0	10823	8388	3.9	0.18	30.6
run 2	126	40.1	13.6	10645	8303	2.9	0.14	
run 3	129	42.1	14.7	11182	8567	4.0	0.19	

* Stripped condensate used for water supply

Champion International Corporation - Pensacola Mill
VOC test results - oxygen delignification system
Testing preformed by Harmon Engineering Associates, Inc., November, 1988

Hardwood Blowtank Vent

Condition	Temp oF	fps	H20 %	acfm	sdcfm	VOC ppm	VOC lb/hr	Avg. Pulp TPH
Condensate*								
Run 1	173	32.7	43.4	4652	2209	18.7	0.23	24.39
Run 2	172	30.7	42.4	4445	2151	21.0	0.25	
Run 3	171	10.0	41.5	1446	712	11.9	0.05	
Fresh water	154	10.9	27.7	1570	980	7.9	0.05	29.19
Run 1	149	10.8	24.6	1554	1019	20.2	0.12	
Run 2	156	11.6	29.2	1672	1017	2.0	0.01	
Run 3	156	10.3	29.2	1485	904	1.6	0.01	

Hardwood Filtrate Tank Vent

Condition	Temp oF	fps	H20 %	acfm	sdcfm	VOC ppm	VOC lb/hr	Avg. Pulp TPH
Condensate*								
Run 1	168	---	38.8	1024	---	36.1	0.21	30.22
Run 2	165		36.2			8.4	0.05	
Run 3	169		39.7			6.5	0.04	
Fresh water								
Run 1	165	---	36.2	1024	---	10.0	0.06	29.19
Run 2	167		37.9			11.9	0.07	
Run 3	171		41.6			11.5	0.07	

Hardwood Post Oxygen Washer Hood Vent

Condition	Temp oF	fps	H20 %	acfm	sdcfm	VOC ppm	VOC lb/hr	Avg. Pulp TPH
Condensate*								
Run 1	129	40.7	14.6	10810	8333	5.4	0.25	24.39
Run 2	129	38.9	14.6	10342	7975	5.1	0.23	
Run 3	129	37.4	16.3	9928	7450	3.6	0.15	
Fresh water	128	41.4	14.5	10998	8474	1.7	0.08	29.19
Run 1	126	40.6	13.6	10797	8436	1.9	0.09	
Run 2	128	42.0	14.3	11153	8617	1.5	0.07	
Run 3	131	41.6	15.5	11044	8370	1.6	0.08	

* Stripped condensate used for water supply

Champion
Champion International Corporation

DATE 11/17 TIME ______ NO OF PAGES 5

TO Bruce Mitchell FROM Kyle Moore

LOCATION ______ LOCATION ______

COMMENTS:

FC-1128

Champion
Champion International Corporation

November 12, 1992

Mr. Bruce Mitchell
State of Florida
Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Dear Mr. Mitchell:

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As we explained to you during the meeting, very limited data is presently available for VOC emissions from these sources. However, for the bleach plant, a good data base is available for chloroform emissions including testing performed by the National Council of the Paper Industry for Air and Stream Improvement (NCASI) at the mill in 1990. The

Meeting Attendance Record

Project: Champion International Corp. Date: 11-5-92

Subject: PSD Permitting

Name	Affiliation / Position	Phone Number
Clair Fancy	FDER/DARM/BAR	904-488-1344
John Brown	"	"
Bruce Mitchell	"	"
Janet Price	Champion International	904 968-2121
KYLE MOORE	"	904 968 4253
Steve Webb	"	904-968-2121
DAVID ARCENEAUX	"	904-968-2121
John BROWN	FDER/DARM/BAR	904 488 1344
John Glunn	FDER/DARM	"
Cleve Holladay	"	"
John Barone	WESTON	215 430-7218
JOHN EGAN	"	" " 7263

Page ___ of ___

AGENDA

CHAMPION MEETING WITH FDER AIR PERMIT STAFF
PENSACOLA MILL CONSENT ORDER
PHASE I - PROCESS MODIFICATIONS
November 5, 1992
ROOM 338

1. Review of Project Description
2. Review of base line data and emissions
3. FDER comments/concerns related to 1 and 2
4. Status of model needs
5. VOC emissions from oxygen delignification and bleach plant
6. Air toxics
7. Status of permit review by FDER
8. Timing of permit submittal

11-5-92

PSD:

NOx, CO, VOC

MEE: enlarge one of the eva

install an add. condensate stripper /or enlarge the existing one -> NCG sys -> kiln

Baseline

PBs - AP-42 EF

rest- actual tests

NCG- SO2 -> supplier

Kiln: 95% conf. factor due to process variables

SO2

lime mud drier - will accept a SO2 limit to avoid PSD

RBs - more lignin than the RBs - less than permitted

VOCs

Bleach Plant - RSH -> R8 ClO2 generation

methanol

want to use chloroform as a surrogate

√ on testing done

EPA

Dennis -

O2 delignation - ↑ pulp due to previous cooking process

knots -> ↑ pulp

WESTON
MANAGERS DESIGNERS/CONSULTANTS
1 WESTON WAY
WEST CHESTER, PA 19380-1499
PHONE: 215-692-3030
FAX: 215-430-3186

5 November 1992

Mr. Cleveland G. Holladay
State of Florida
Department of Environmental Regulations
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Work Order No. 02246-056-001

Dear Mr. Holladay:

In accordance with your request, enclosed are computer disks of meteorologic data for Pensacola, Florida, which will be used in Champion International's air quality modeling analysis. The data includes pre-processed surface and upper air data suitable for use in the ISCST2 model. Also included is a STAR distribution which can be used with the ISCLT2 model.

The following is a listing of the data files contained on the disks:

METFRM.EXE	-	ASCII formatted data for ISCST2
METLPR.EXE	-	Lahey formatted data for ISCST2
METMPR.EXE	-	Microsoft formatted data for ISCST2
METLT.EXE	-	ASCII formatted frequency distribution for ISCLT2

Data are for the period 1985 - 1989. Also included is a data format table listing the parameters and corresponding format.

Please call if you have questions or wish to discuss this information.

Very truly yours,

ROY F. WESTON, INC.

John B. Barone, Ph.D.
Technical Director

JBB:ndl

Enclosure

Table 1
Meteorological Data Format

Record 1 (occurs once)		Format
Surface Station		I5
Year		I4
Upper Air Station		I5
Year		I4
Record 2 Through Number of Days	**Units**	**Format**
Year		I4
Month		I2
JDay		F5.0
Stability		I1
Wind Speed	m/sec.	F5.2
Temperature	°K	F4.0
Flow Vector (1)	Degrees	F4.0
Random Flow Vector (1)	Degrees	F4.0
Rural Mixing Height	Meters	F6.0
Urban Mixing Height	Meters	F6.0

(1) Towards which the wind blows.
i.e. If the wind is from 10° the flow vector is 190°
If the wind is from 240° the flow vector is 60°

Printing and Writing Papers
375 Muscogee Road
P.O. Box 87
Cantonment, Florida 32533-0087
904 968-2121

Champion
Champion International Corporation

RECEIVED

OCT 15 1992

Division of Air
Resources Management

October 14, 1992

Mr. Clair Fancy
State of Florida
Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Dear Mr. Fancy:

Per your request, Champion would like to pre-submit sections of an air construction permit application. This application address required air impact assessment associated with planned process changes to comply with an effluent consent order with the Department. Champion is submitting these sections ahead of the full application to allow the Department additional time to review the application.

The sections being submitted today include a description of the proposed modifications and a partial summary of existing emissions. Not included in the existing emissions summary are the data from the existing bleach plant. Enclosed are two copies of Section 2 and Section 3 of the application.

Champion intends to submit the bleach plant emissions summary along with the emissions associated with the proposed modification by the end of October. The complete application will be submitted by the middle of November.

If you or your staff have any questions concerning this material, please call me at the mill. My phone number is (904) 968-2121, Extension 2519.

Sincerely,

David T. Arceneaux
Permitting Coordinator

DTA:sa

Enclosures

cc: Ed Middleswart, Northwest District

SECTION 2

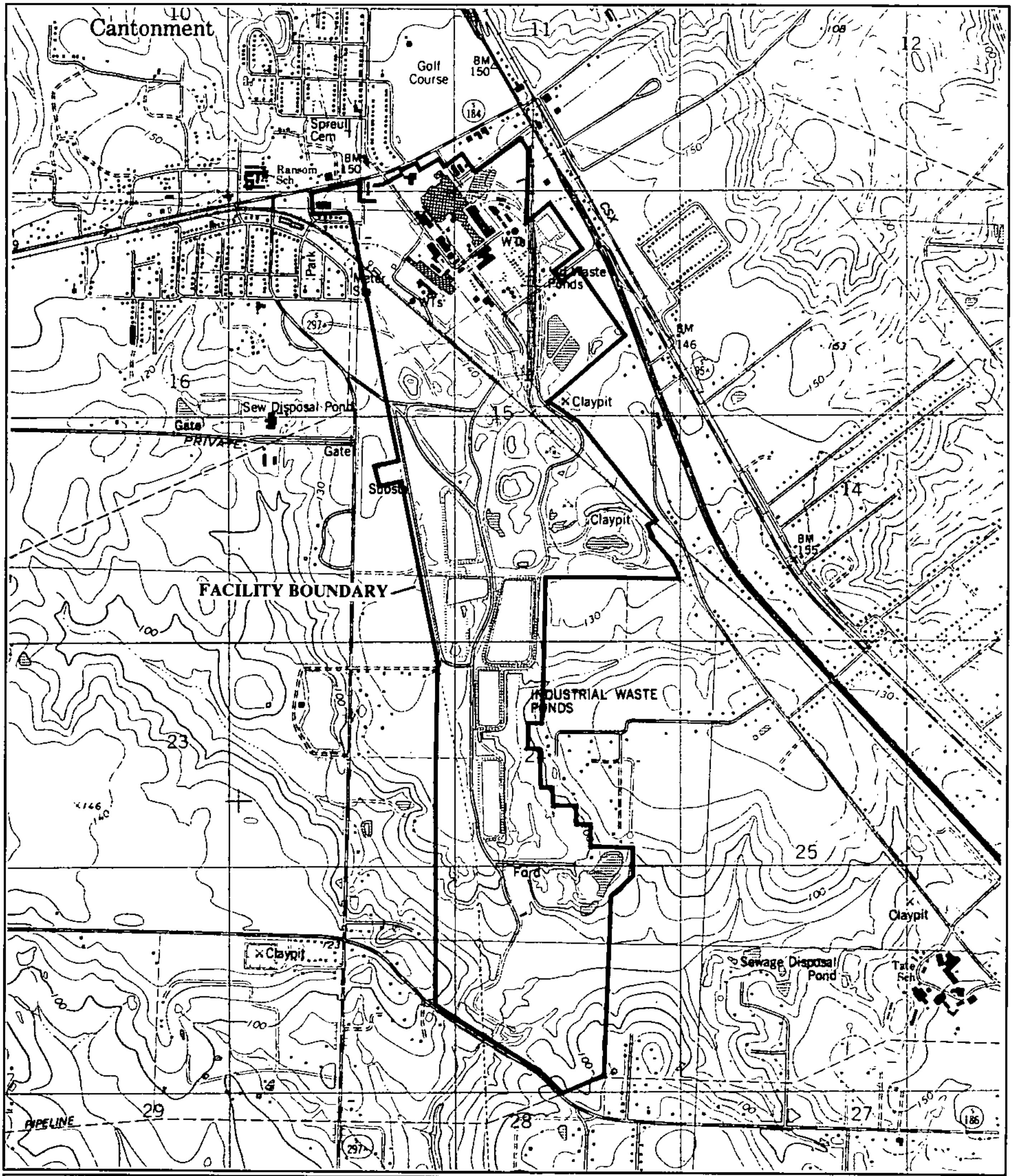
DESCRIPTION OF EXISTING MILL AND PROPOSED MODIFICATION

2.1 INTRODUCTION

The CHAMPION Pensacola Mill is located in Escambia County, Florida, near the town of Cantonment. Figure 2-1 is a site location map showing the proximity of the facility to the town of Cantonment. The land area around the site is relatively flat terrain and would be classified as a rural land use pattern based on EPA's classification scheme. The air quality in the area has been designated as attainment or unclassifiable for all ambient air quality standards.

CHAMPION's existing pulp mill has been in operation since 1941. Major mill expansion projects were completed in 1981 and 1986. The 1986 expansion resulted in a complete conversion to production of bleached kraft fine paper. The existing facilities were permitted by the Florida Department of Environmental Regulation (DER) in 1985. In 1991 a PSD Permit application was submitted to Florida DER for a new package gas-fired boiler. The CHAMPION Pensacola Mill is currently permitted for 1400 air-dried, bleached tons of pulp per calendar day.

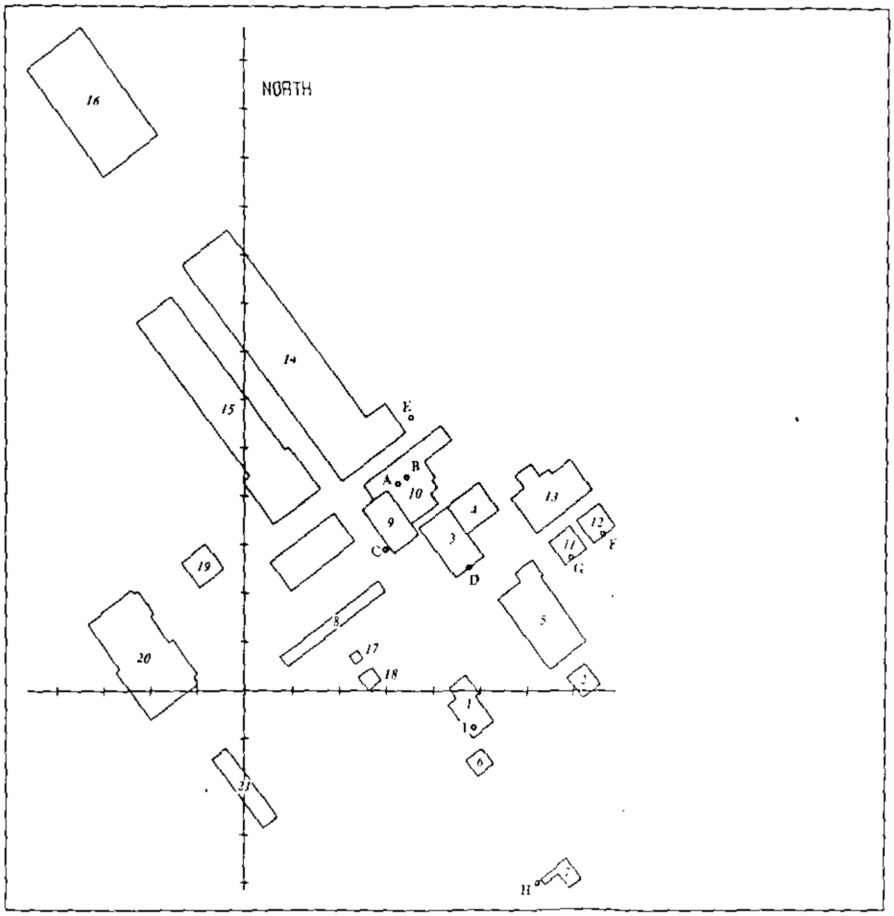
The existing bleached kraft pulp mill includes wood preparation and storage, coal/wood fuel handling and storage, batch digesters, a continuous digester, brown stock washing, oxygen delignification, pulp bleaching facilities, recovery furnaces, power boilers, black liquor evaporators, smelt dissolving tanks, a lime kiln and calciner, recausticizing facility, and tall oil and turpentine byproducts facilities. Figure 2-2 presents a plot plan of the facility identifying the location of major emission points.



SOURCE: BASE MAP ADAPTED FROM USGS 7.5 MINUTE SERIES, CANTONMENT, FLA. QUADRANGLE, 1978, PHOTOREVISED 1987.

CHAMPION INTERNATIONAL CORPORATION
PENSACOLA FACILITY
CANTONMENT, ESCAMBIA COUNTY
FLORIDA

FIGURE 2-1
LOCATION MAP OF THE PENSACOLA FACILITY



BUILDING STRUCTURE

1. -	LIME RECOVERY BUILDING
2. -	COOLING TOWER
3. -	NO. 4 POWER BOILER
4. -	TURBINE GENERATOR BUILDING
5. -	EVAPORATORS
6. -	LIME KILN NORTH
7. -	LIME KILN SOUTH
8. -	BATCH DIGESTERS
9. -	NO. 3 POWER BOILER
10. -	NO 1 & 2 BOILER
11. -	RECOVERY BOILER PRECIPITATOR 1
12. -	RECOVERY BOILER PRECIPITATOR 2
13. -	RECOVERY BOILERS
14. -	PAPER MACHINE COMPLEX
15. -	HIGH BAY STORAGE BUILDING
16. -	WAREHOUSE
17. -	KAMYR DIGESTER
18. -	KAMYR DIFFUSER
19. -	NO. 9 H. D. STORAGE
20. -	BLEACH PLANT
21. -	CHIP SILO

SOURCES:

A. -	NO 1 POWER BOILER STACK
B. -	NO 2 POWER BOILER STACK
C. -	NO. 3 POWER BOILER STACK
D. -	NO. 4 POWER BOILER STACK
E. -	NO 5 POWER BOILER STACK
F. -	RECOVERY BOILER STACK 1
G. -	RECOVERY BOILER STACK 2
H. -	LIME KILN STACK
I. -	CALCINER STACK

NORTH
0 100 200 400
SCALE IN FEET

SOURCE: BASE MAP ADAPTED FROM DRAWINGS SUPPLIED BY CHAMPION

CHAMPION INTERNATIONAL CORPORATION
PENSACOLA FACILITY
CANTONMENT, ESCAMBIA COUNTY
FLORIDA

FIGURE 2-2
LOCATION OF STACKS AND PRIMARY BUILDINGS IDENTIFIED FOR SCHULMAN-SCIRE DOWNWASH ANALYSIS

2.2 MILL CONSENT ORDER

The Pensacola Mill is currently operating under a water permit consent order from the Florida DER. Compliance with water quality standards must be attained by 1994 to meet the schedule contained in the consent agreements. The proposed mill modifications, contained in this air permit application, involve process changes aimed at reducing wastewater loads or minimizing waste load constituents to CHAMPION's treatment system in order to meet the requirements of the consent order.

It is important to point out that the proposed modification would not be undertaken if not for the consent order. The changes are not aimed at increasing mill production, nor are they intended to increase throughput on individual units other than to handle additional materials generated as a result of the wastewater load reduction program. However, the modifications will increase pulp production through the bleach plant due to minimization of fiber losses and fiber degradation. While the actual increase in pulp production which will result from the modifications cannot be quantified at this time, it is anticipated to be less than 10%.

The proposed program can be characterized as follows:

- Modifications to the bleach plant operations to reduce effluent load to the wastewater treatment facilities.
- Process modifications to improve delignification, decrease waste and improve chemical recovery.
- Process modifications to minimize spills and leaks.
- Process modifications to reduce sewering of high concentration waste streams.

A description of the existing mill processes and the proposed modification to these processes follows.

2.3 EXISTING PROCESS DESCRIPTION

An even mix of hardwood and softwood pulp is produced from wood furnished by on-site and satellite chip mills. The wood chips are stored and screened in separate hardwood and softwood storage yards. The kraft cooking process is used to separate the lignin and wood fiber to produce brown pulp from wood chips. Softwood pulp is produced in a continuous digester, washed by a two-stage atmospheric diffusion washer, separated from wood knots by a disc knotter, and screened to separate rejects. Hardwood chips are cooked in twelve conventional direct steam batch digesters and discharged into two blow tanks common to all twelve digesters. The hardwood brown pulp is separated from wood knots by vibratory knotters and washed by two parallel lines of drum-type brown stock washers, and then screened to separate rejects. The softwood and hardwood pulps are further delignified in separate oxygen delignification reactors. After oxygen delignification, the hardwood and softwood pulps are further washed and bleached in a three-stage bleach plant. The hardwood and softwood bleach plants are identical and include:

- A chlorination stage with chlorine dioxide added;
- An oxidative caustic extraction stage; and
- A final chlorine dioxide bleaching stage.

The chlorine dioxide is generated on site in a unit designed to produce sixteen tons per day. Liquid chlorine, caustic soda, and liquid oxygen are all delivered to the site by rail or truck prior to use in the process. The chlorine and oxygen are vaporized prior to use.

The organic or lignin laden filtrates (black liquor) from the pulping, oxygen delignification, and washing processes are concentrated through two sets of evaporators. The No. 1 Evaporator Set mainly processes black liquor from the softwood pulp mill, while the No. 2

Evaporator Set processes hardwood black liquor. The black liquor is concentrated to about 65% solids and burned in two identical Babcock and Wilcox recovery furnaces (No. 1 and No. 2). The recovery furnaces produce steam for energy generation and heat for the pulp and paper making processes. The molten inorganic ash (smelt) from the recovery furnaces is dissolved in water to make green liquor which is then reprocessed into reusable cooking chemicals in the mill's causticizing plant. The causticizing process combines lime with the green liquor in a slaker reactor to produce a sodium hydroxide and sodium sulfide solution (white liquor), which is the principle wood chip cooking chemical. A by-product from the slaking reaction is calcium carbonate or lime mud. The lime mud is washed and then reburned in an Allis Chalmers type rotary kiln, and a Dorr-Oliver type fluidized bed calciner to produce reusable lime for the slaking reaction.

The mill utilizes five power boilers to produce steam for energy generation and provide heat for the pulping and paper making processes. Through cogeneration by utilization of two steam-driven turbines, the mill can produce nearly all of the electricity and steam required to run the mill operations. Power Boiler Nos. 1, 2, and 5 are natural gas fired. Power Boiler No. 3 is coal fired with natural gas as an alternate fuel. No. 4 Power Boiler is coal and bark fired with natural gas as an alternate fuel.

Product paper is produced from the pulp on two paper machines. Copy paper is produced on the No. 5 Paper Machine and is cut, sized, and packaged in a side processing plant for final sale. The paper produced on the No. 3 Paper Machine is shipped in either sheet or roll form to final customers. Market pulp is dried on a pulp drying machine as bales or rolls for final sale.

The mill utilizes sump systems in selected areas which are activated by conductivity to reclaim process losses into collection tanks. The reclaimed losses are reintroduced into the chemical recovery process. Distributed process control systems are used in nearly all the major process areas to improve process stability and control.

2.4 EXISTING MILL AIR SOURCES

The Pensacola Mill currently operates a total of twenty-nine (29) air sources which are covered by twenty-one (21) DER air permits. Table 2-1 is a summary list of the sources, the source ID number, and the permit number under which the source operates. The majority of the mill sources will not be impacted by the proposed consent order modifications. The sources which will be affected by the project include some sources which will be physically modified and will experience throughput increases, and other sources which will not be modified but will experience throughput increases.

The sources impacted by the project fall within three main areas of the mill pulping process as follows:

- Chemical cooking
- O_2 delignification and bleaching
- Chemical recovery and power generation

The existing sources in each area which will be affected by the project are depicted in Figure 2-3 and are discussed below.

Chemical Cooking

The air emission sources in the chemical cooking area include the digesters, the brown stock washers, and the non-condensible gas (NCG) system. The digester systems on both the hardwood and softwood lines are closed systems which vent off-gases to the NCG system. Condensate from the cooking process is stripped to remove as much of the organic fraction as possible, and the off-gas from the condensate stripper is also vented to the NCG system. The NCG system itself vents to either the lime kiln or the lime calciner. The lime kiln is used as the primary control device for incinerating the NCGs with the calciner serving as backup.

TABLE 2-1
CHAMPION INTERNATIONAL CORPORATION - PENSACOLA MILL
FLORIDA DER AIR PERMITS

SOURCE	PERMIT #	SOURCE ID #
Wooodyard	AO17170657	10PEN1700 4252 & 58
Kamyr Digesters	AO17212422	10PEN1700 4254
Kamyr Diffusion Washer	AO17212422	10PEN1700 4254
Condensate Stripper	AO17212422	10PEN1700 4254
Batch Digesters	AO17212422	10PEN1700 4253
Brown Stock Washers	AO17212422	10PEN1700 4253
A Line 0_2 Delignification	AO17142570	10PEN1700 4250
B Line 0_2 Delignification	AO17142570	10PEN1700 4251
A Line Bleach Plant	AO17142570	10PEN1700 4250
B Line Bleach Plant	AO17142570	10PEN1700 4251
Salt Unloading	AO17142572	10PEN1700 4256 & 57
Chlorine Dioxide Generator	AO17142566	10PEN1700 4247, 48, & 49
Multiple Effect Evaporators	AO17212422	10PEN1700 4255
No. 1 Recovery Furnace	AO17181730	10PEN1700 4230
No. 1 Smelt Dissolving Tank	AO17181734	10PEN1700 4232
No. 2 Recovery Furnace	AO17181732	10PEN1700 4229
No. 2 Smelt Dissolving Tank	AO17181735	10PEN1700 4238
Lime Slaker	AO17137615	10PEN1700 4246
Lime Kiln	AO17181738	10PEN1700 4228
Fluo-Solids Unit (Calciner)	AO17151541	10PEN1700 4236
Tall Oil Plant	AO17181741	10PEN1700 4201
No. 1 Power Boiler	AO17181726	10PEN1700 4224
No. 2 Power Boiler	AO17181727	10PEN1700 4214
No. 3 Power Boiler	AO17146028	10PEN1700 4233
No. 4 Power Boiler	AO17145038	10PEN1700 4237
No. 5 Power Boiler	AO17203050	10PEN1700 4202
Coal Crushing and Handling	AO17143517	10PEN1700 4239 & 40
P5 Dry Additives	AO17213490	10PEN1700 4245
P5 Starch	AO17213492	10PEN1700 4244

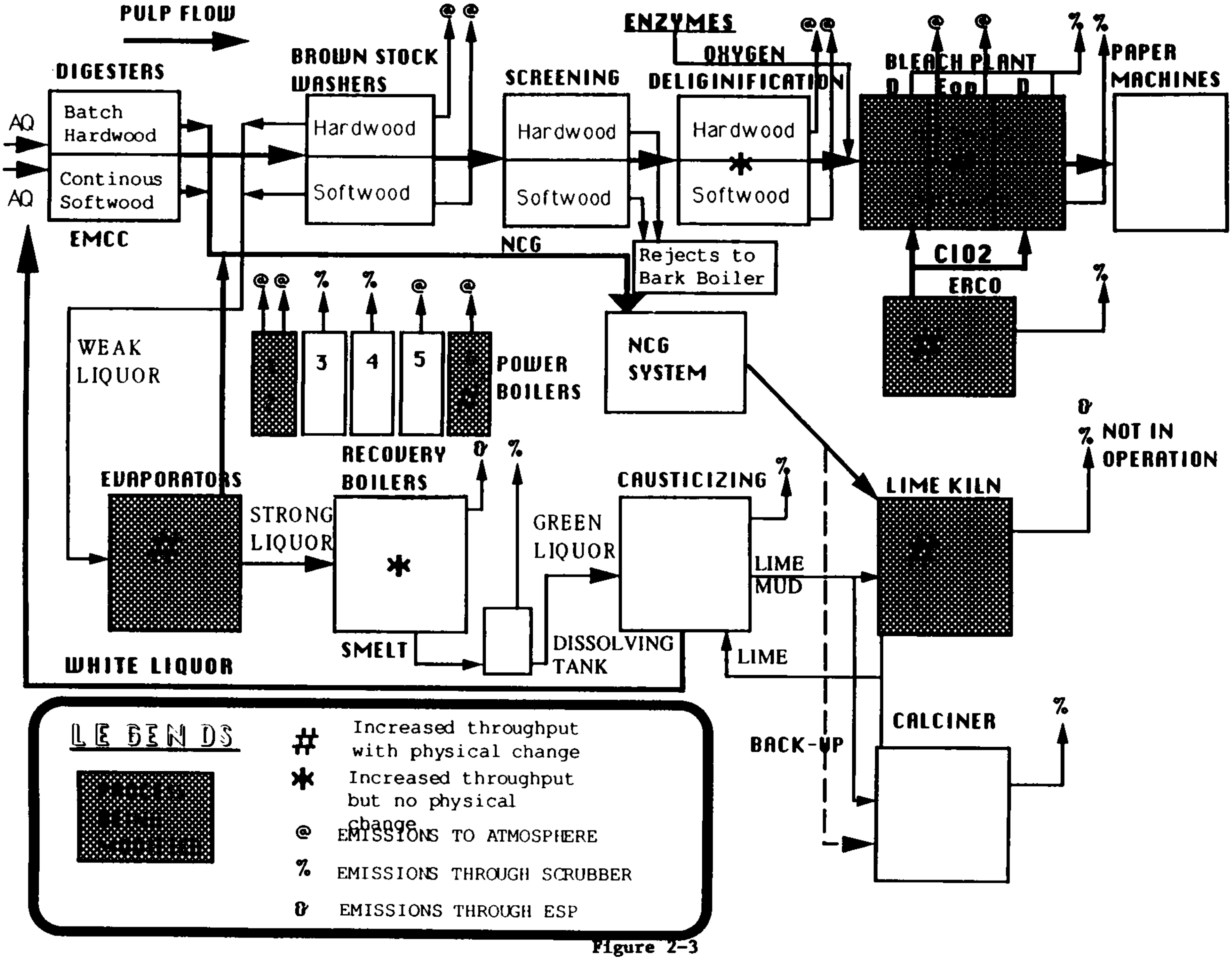

PULP FLOW
DIGESTERS
Batch Hardwood
Continous Softwood
AQ
AQ
EMCC
BROWN STOCK WASHERS
Hardwood
Softwood
SCREENING
Hardwood
Softwood
ENZYMES
OXYGEN DELIGINIFICATION
Hardwood
Softwood
BLEACH PLANT
D
Eop
D
PAPER MACHINES
NCG
Rejects to Bark Boiler
ClO2
ERCO
NCG SYSTEM
WEAK LIQUOR
3
4
5
POWER BOILERS
RECOVERY BOILERS
EVAPORATORS
STRONG LIQUOR
GREEN LIQUOR
CAUSTICIZING
LIME KILN
& % NOT IN OPERATION
LIME MUD
LIME
SMELT
DISSOLVING TANK
WHITE LIQUOR
BACK-UP
CALCINER
LEGENDS
Increased throughput with physical change
* Increased throughput but no physical change
@ EMISSIONS TO ATMOSPHERE
% EMISSIONS THROUGH SCRUBBER
& EMISSIONS THROUGH ESP

Figure 2-3

The other sources in the cooking area include the diffusion washer on the softwood line and the brown stock washers on the hardwood line. The washers on both lines vent directly to the atmosphere.

O_2 Delignification and Bleaching

The washed brown stock from the cooking processes are further delignified using oxygen in separate O_2 reactors on each line. The O_2 delignification systems on each line are identical and include three vents each, as follows:

- The pre-O_2 decker washer vent
- The O_2 blow tank vent
- The post-O_2 washer vent

Following O_2 delignification, the pulp is processed through the bleaching system. The existing Pensacola bleaching operations are similar for each line and include the following sources:

- Cl/ClO_2 scrubber - This scrubber uses white liquor to control the emissions from the chlorination stage and chlorine dioxide stage of the existing bleaching sequence.

- E_o tower vent and E_o washer vent - These sources are direct atmospheric vents from the oxidative extraction stages of the existing bleaching sequence.

ClO_2 for the existing mill bleaching sequence is generated on site in an ERCO R3H generator. The unit uses salt, sulfuric acid, and sodium chlorate to generate ClO_2 and Cl_2. The current bleaching sequence includes chlorine and chlorine dioxide in the first stage, an oxygen extractive stage, and chlorine dioxide in the final stage (C_DE_OD). There are five vent sources associated with the ClO_2 generator as follows:

- One tail gas scrubber - This scrubber uses sodium hydroxide to control Cl_2 and ClO_2 from the generator.

- Two ClO_2 storage tanks controlled by chilled water scrubbers.

- Two salt unloading/pneumatic transfer systems controlled by separate water spray towers.

Chemical Recovery and Power Generation

The chemical recovery and power generation area includes the process equipment associated with recovering the cooking chemicals and the power boilers which generate the necessary process steam. Each of the sources affected by the proposed project are detailed below.

- *Multiple Effect Evaporators* - The evaporators are used to concentrate the weak black liquor prior to firing in the recovery furnaces. The off-gas from the evaporators is vented into the NCG system previously described and is ultimately combusted in the lime kiln or calciner.

- *No. 1 and No. 2 Recovery Furnaces* - These boilers burn the concentrated black liquor to generate process steam and to recover smelt for further reprocessing. The boilers are identical Babcock and Wilcox low-odor design units equipped with dual-chamber multifield electrostatic precipitators (EPs) to control particulate matter emissions.

- *Lime Kiln* - The lime kiln is used to calcine lime mud from the slaking process in the chemical recovery area. The kiln is permitted to burn natural gas and is rated to produce up to 328 tons of CaO per day. It also serves as the primary control device for the NCGs generated in the pulping process. Particulate emissions from the kiln are controlled by a venturi scrubber and mist separator.

- *No. 1 Power Boiler* - This boiler is a natural gas-fired boiler originally rated to produce 140,000 pounds of steam per hour and having a derated heat input of 175mm BTU per hour.

- *No. 2 Power Boiler* - This boiler is a natural gas-fired boiler originally rated to produce 140,000 pounds of steam per hour and having a derated heat input of 170mm BTU per hour.

2.5 MODIFIED AND NEW AIR SOURCES

The project will affect the various air sources outlined in Section 2.4 on a source-specific basis. The following information is intended to provide details on the changes which each of the existing affected sources will experience, and also to provide information on the proposed new No. 6 Power Boiler which will replace the No. 1 and No. 2 Power Boilers as part of the project. The information is presented based upon the production area groupings previously identified in Section 2.4.

Chemical Cooking

Improved delignification in the cooking processes might play a role in reducing the wastewater treatment load. CHAMPION has identified two potential changes to be made to the digester processes to improve delignification, including:

- Extended modified continuous cooking (EMCC)
- Anthraquinone cooking (AQ)

It is important to understand that these are both changes in the cooking process which should not impact air emissions from the system. Therefore, by themselves EMCC and AQ do not require air permitting. Both methods have undergone trial efforts at the Pensacola Mill and continue to be evaluated.

EMCC can only be considered in the continuous digester serving the softwood line. It involves changes in feeding the cooking liquor into the digester in stages and different cooking conditions. If successfully implemented, it is expected to produce a pulp which is easier to wash, therefore, improving lignin extraction. While some changes in piping are required for the digester, it is a sealed unit with any emissions ultimately vented directly to the NCG system. No increase in throughput occurs in the digester as a result of EMCC.

Anthraquinone (AQ) is an organic catalyst which accelerates and increases the selectivity of the wood cooking chemicals in the delignification of the pulp fiber. It can potentially be used in both the batch digesters serving the hardwood line and the continuous digester serving the softwood line. The ultimate goal of applying AQ is a reduction in the organic loading, the color, and the conductivity in the bleach plant effluent and further reduction in the chlorine usage in the bleach plant.

The project will require the installation of storage and handling equipment for AQ. AQ is water soluble and, therefore, CHAMPION proposes to utilize a system designed for transporting and storing water-soluble anthraquinone (SAQ). AQ is not on the Clean Air List of 189 Air Toxics. It is a reportable substance and adequate containment of the storage and unloading facility will be provided.

While both EMCC and AQ are changes in the digester cooking processes, it is believed that there will be no changes resulting in the emissions from the digesters following implementation of these methods. Since feed rate to the digesters will not change the material flow rate from the digesters to the brown stock, washers will also be unchanged. Air emissions from the brown stock washers should be no different following implementation of these improved cooking methods.

O_2 Delignification and Bleaching

The washed brown pulp from the cooking processes goes through further delignification in

O_2 reactors on each line. If these improvements in the digester cooking processes occur, less fiber may be wasted which could result in an increase in the fiber processed through the O_2 delignification systems. Since there could also be reduced levels of lignin in the brown pulp, the emissions from the pre- and post-O_2 washers and the O_2 blow tank are not expected to change as a result of the project, even if fiber throughput increases.

The most significant change in the pulp production process will be the conversion of the existing C_DE_OD bleach plant. This will be accomplished by elimination of the existing chlorine gas handling system, the addition of a hydrogen peroxide handling system, and the modification of the chlorine dioxide generator. In addition, enzymes may be added to the high density storage tanks between the oxygen delignification systems and the bleach plants. Each of these changes is detailed below.

- *Enzyme Bleach Boosting* - Enzyme bleach boosting is a new technique which must still undergo field trails. It involves the application of xylanase enzyme prior to pulp bleaching with the purpose of modifying the chemical structure to make subsequent bleach stages more efficient. The high degree of specificity of action and mild working conditions generally result in fewer non-desirable byproducts. This tends to give a more efficient process and should lead to improved process yields. Significant reductions in chlorine dioxide required to bleach pulp are possible with no significant impact on pulp properties.

  From an environmental viewpoint, enzymes are safe and quite desirable. They are easy to handle, require mild conditions for reaction, are effective in small amounts, biodegradable, and non-toxic. The xylanase enzymes to be used in pulp bleaching are categorized as food grade products.

  The use of enzymes will require the installation of enzyme storage and handling facilities. Since enzymes are water soluble, there will be no air emission associated with this system.

- *Chlorine Dioxide Substitution for Chlorine* - The mill will eliminate the use of molecular chlorine as a bleaching agent, and the first stage of each bleach plant will be 100% chlorine dioxide. This will require a modification of the existing chlorine dioxide generator.

  The existing generator is an ERCO R3H which uses salt, sulfuric acid, hydrochloric acid, and sodium chlorate to generate chlorine dioxide and chlorine. The generator will be modified to an R8 process which uses methanol, sulfuric acid, and sodium chlorate to generate chlorine dioxide. The conversion to R8 is necessary to eliminate the chlorine gas byproduct which is currently generated in the R3H process. The modified reactor capacity will be increased from the present 16 tons per day to 37.4 tons per day of chlorine dioxide. A new storage tank will also be installed, as well as modification of the existing chlorine absorption towers to chlorine dioxide absorption towers.

  The existing tail gas scrubber will be modified by installing an extra 10 feet of tower and the scrubbing media will be changed from sodium hydroxide to white liquor (sodium hydroxide plus sodium sulfide). The existing storage tank scrubbers, as well as the new storage tank scrubber will be rerouted to the tail gas scrubber.

  The existing salt unloading and storage system will be shut down and dismantled.

  The existing bleach plant scrubbers are equally effective for chlorine and chlorine dioxide removal, and the scrubber systems have adequate capacity for the expected emissions. Therefore, no change in the bleach plant scrubber system is planned.

- *Peroxide Fortified Oxidative Caustic Extraction* - Hydrogen peroxide is an oxidizing agent that works optimally in alkaline conditions and is typically applied to the pulp in a 50% solution. The peroxide is applied in the oxidative extraction stage. The hydrogen peroxide is a non-specific oxidizer that reacts as readily with the extracted lignin as it does with the pulp. Because of the non-specificity, half of the peroxide decolorizes the extraction filtrate. The other half of the charge increases the brightness of the pulp leaving the extraction stage. Because of the higher brightness achievable, chlorine dioxide charged to either the first stage or the final bleaching stage is reduced.

The use of hydrogen peroxide will require the installation of a storage and handling system for the chemical. The peroxide will completely react in the extraction tower. There are no air emissions associated with the use of hydrogen peroxide.

Chemical Recovery and Power Generation

The improvements in the chemical cooking processes will result in increased organic levels in the weak liquor. Furthermore, the other mill improvements aimed at reducing the amount of wastewater generated by minimizing process losses will increase the overall load to the multiple effect evaporators and through the subsequent chemical recovery process. Other improvements to the existing facility associated with minimizing process losses include upgrading the evaporator foul condensate stripper and modifying the lime kiln. Each of the affected air emission sources are discussed below.

- *Evaporation Capacity Upgrade* - Reclaimed process or liquor losses eventually are processed through the black liquor evaporators. These evaporators are currently at capacity during normal operation. Any added liquor volume for evaporating reclaimed process losses will require added capacity.

  With the planned process loss containment project and pulp-mill process changes, it is estimated that a 50% increase in evaporation capacity of the No. 2 set evaporator will be needed. This will be accomplished by the addition of two new evaporator effects.

- *Recovery Furnace Operations* - The resulting solids generated from the evaporation of contained spills will be sent to the two recovery furnaces. As a result, the overall annual solids throughput to the recovery furnaces will increase. However, the furnaces will continue to be operated at or below the black liquor solids firing rate limit of 111,000 pounds per hour (virgin plus makeup) contained in the current air permits.

  In order to improve the furnace availability, the existing direct steam injection black liquor heaters associated with the liquor feed systems will be converted to indirect heaters. The indirect heaters will allow more heat to be transferred to the liquor without affecting the heating value of the liquor, in turn allowing more efficient use of the existing limited vertical sweep (LVS) burners in the furnaces, and improving furnace uptime. CHAMPION does not believe that the change in the type of liquor heaters is a modification to the furnaces, but rather is a modification to the fuel delivery system.

  The smelt dissolving tanks associated with each recovery furnace will not experience increased throughput. The majority of additional solids burned in the recovery furnaces will be organic, i.e., lignin from the wood. The small amount of inorganic solids (sodium and sulfur compounds) collected will be offset by the reduction of purchased makeup chemicals. Since the lignin will be burned in the boiler, the throughput of smelt to the dissolving tank will not change.

- *Evaporator Foul Condensate Stripping Upgrade* - Various volatile organic compounds are released with digester steam after the cooking of wood chips. Some of the volatile compounds or non-condensible gases are piped to the lime kiln and burned. The remaining portion is dissolved and carried in the digester steam (contaminated) condensate to a heat recovery system. Condensates from the black liquor evaporation process are also rich in dissolved organic compounds. Most of the organic component in digester steam and evaporator condensates is methanol and other low molecular weight compounds. These compounds produce a very large biochemical oxygen demand on the wastewater treatment facility. The mill currently collects and steam strips most of the more concentrated or "foul" condensates. The liberated volatile organic compounds are then burned with the non-condensible gases in the lime kiln. However, a significant BOD load is discharged to the waste treatment plant due to an excess of less contaminated condensates and the lack of stripping capacity.

CHAMPION has evaluated the upgrade of the existing contaminated condensate stripper and the installation of an additional steam stripper. With added stripper capacity, initial estimates have shown that the mill effluent BOD load to the wastewater treatment plant could be reduced by as much as 15%. The evaluation is currently not completed, and the exact configuration has not been determined.

The installation of a stripper will not directly affect air emission except to the extent these chemicals are being stripped in the wastewater treatment system. In that regard, a steam stripper will directly reduce the emissions of volatile compounds. There will be an indirect impact on air emissions since the collected compounds will be burned in the lime kiln and/or calciner.

- *Lime Reburning Capacity - Lime Mud Dryer Upgrade* - Currently, the lime kiln and calciner cannot process all of the lime mud produced by the causticizing process. The difference between the current lime reburning capability and the requirements to produce white liquor for the pulping process is made up with purchased fresh lime. The excess lime mud (calcium carbonate) produced in the causticizing operation is discharged to the sewer in a weak wash solution. The sewered lime mud flows to the waste treatment primary settling basin, is dredged with other mill settled sludge, and pumped to the decanting basins. The combined mud and mill sludge is reclaimed from the decanting basins and hauled to the landfill. The weak wash solution sewered with the lime mud is an alkaline solution that has to be neutralized in the settling basin by carbon dioxide injection. However, the alkaline solution increases the mill effluent conductivity.

An upgraded kiln capacity will supply the total lime requirements eliminating the sewering of lime mud in weak wash solution as part of daily operation. Initial estimates indicate that the required capacity increase will reduce daily landfill by approximately 100 tons and reduce the conductivity by about 20%.

The increase in lime kiln capacity will be accomplished by the installation of a lime mud dryer. Figure 2-4 shows a representation of the system.

The fluid bed calciner will not be changed, and the normal throughput will not change.

The amount of lime added to the green liquor in the slaker will not change. The additional reburned lime from the modified lime kiln will allow the reduction of purchased fresh lime.

There will be a slight increase in non-condensible gases (NCGs) and rectifier gases (methanol) being burned in the lime kiln. The only impact will be to increase the amount of sulfur dioxide formed in the kiln due to the sulfur in the NCGs. Since testing has shown a near 100% removal of sulfur dioxide by the system, there should be no impact on air emissions.

- *Steam Capacity Upgrade (No. 6 Package Boiler)* - Added steam capacity will be required to support the process modifications. The specific added steam demand will come from an increase in evaporation and contaminated condensate stripping capacity, black liquor heaters, the cooking modifications, and bleach plant load reduction technologies.

In addition to the added steam demand, CHAMPION will shut down No. 1 and No. 2 power boilers. These boilers, built in the early 50s, are in poor repair and poor efficiency.

A new high pressure steam boiler to supply 350,000 pounds per hour additional steam load for consent order projects and replacement of the two obsolescent power boilers will be installed.

AHLSTROM LIME MUD DRYER SYSTEM

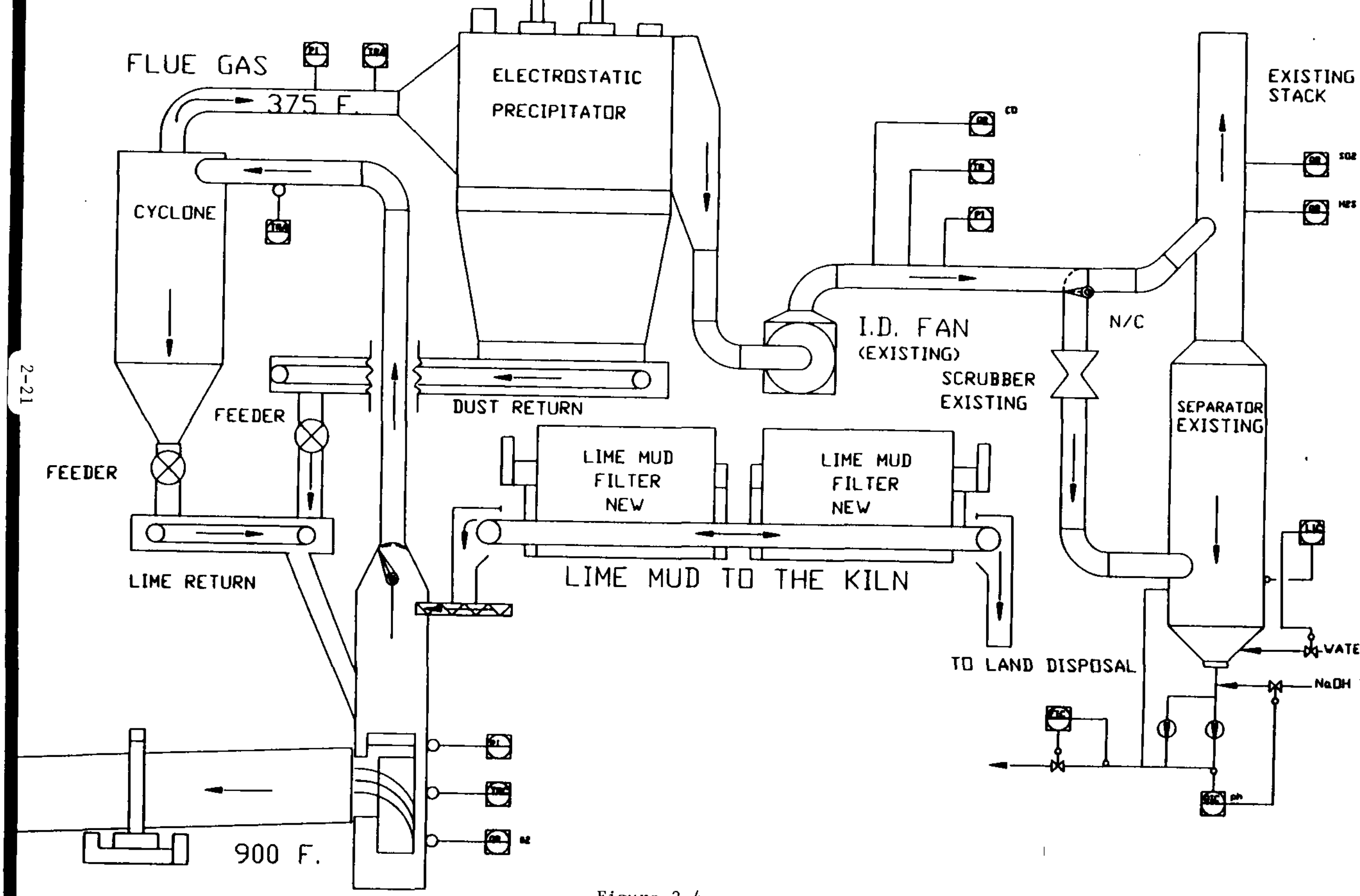


Figure 2-4

SECTION 3
SUMMARY OF EMISSIONS

3.1 INTRODUCTION

A baseline and proposed future emissions inventory has been developed for the Pensacola mill sources affected by the proposed modifications. A list of the affected sources is included in Table 3-1. The inventory includes baseline emission rates from the existing affected sources and future emission rates for the proposed new and modified sources.

The baseline emission rates have been developed based on the two year period dating from July 1, 1990 through June 30, 1992. The baseline rates were determined using the individual source operating information including: fuel use data, process throughput data, actual source operating hours, and continuous emission monitoring (CEM) data where available. For each affected source, emission factors were developed from available emission tests or CEM data or from applicable literature. The factors were then used with the operating data to calculate annual baseline emission rates. Future emissions were projected using vendor data or guarantees, where available.

The following sections briefly identify the basis for each emission factor and source in the emissions inventory. The actual calculations, source operating data, and detailed monthly emission rates for the period July 1990 - June 1992 are included in Appendix A. Appendix B includes the backup documentation for the data used in the emission calculations.

TABLE 3-1

CHAMPION - PENSACOLA
SUMMARY OF AFFECTED SOURCES

BASELINE SOURCES
No. 1 Power Boiler
No. 2 Power Boiler
Lime Kiln
No. 1 Recovery Boiler
No. 2 Recovery Boiler

3.2 BASELINE EMISSION RATES

A summary of the emission factors utilized for baseline emissions is presented in Table 3-2. The calculated baseline emission rates for the two year averaging period for the affected sources are presented in Table 3-3.

The following subsections provide a brief source-by source description of the development of individual emission factors.

3.2.1 No. 1 Power Boiler

The No. 1 power boiler has a design heat input rating of 180 MMBtu per hour. The primary fuel fired in the boiler was natural gas. However, the boiler is also equipped to burn No. 6 fuel oil for emergency use. For the baseline period, natural gas was the only fuel fired and emissions are based on natural gas usage for the period. The following information presents the basis for the selected emission factors for each pollutant.

- Nitrogen Oxides (NO_x)

  The NO_x emission factor is based upon the average NO_x mass emission rates and total heat input rates measured during a series of three test runs conducted on 8 February 1991. The NO_x emission factor is 0.10 lb/MMBtu.

- Sulfur Dioxide (SO_2)

  The SO_2 emission factor is based upon the typical sulfur content of the natural gas burned in the No. 1 power boiler as supplied by the gas vendor and the assumption of 100% conversion to SO_2. The SO_2 emission factor is 0.0018 lbs/MMBtu.

TABLE 3-2
CHAMPION
PENSACOLA, FLA
SUMMARY OF EMISSION FACTORS
BASELINE EMISSIONS

SOURCE	NO_x	SO_2	CO	PM/PM_{10}	VOC	TRS
#1 POWER BOILER	0.1 lb/MMBtu	0.0018 lb/MMBtu	0.1 lb/MMBtu	0.005 lb/MMBtu	7.82 lb/hr	NA
#2 POWER BOILER	0.42 lb/MMBtu	0.0018 lb/MMBtu	0.1 lb/MMBtu	0.005 lb/MMBtu	7.77 lb/hr	NA
LIME KILN	15.5 lb/hr	0.43 lb/hr	1.4 lb/hr	14.0 lb/hr	0.41 lb/hr	2.02 lb/hr
#1 RECOVERY BOILER⁽¹⁾	1.5 lb/ton BLS	1.33 lb/ton BLS	7.25 lb/ton BLS	1.12 lb/ton BLS	0.144 lb/ton BLS	0.019 lb/ton BLS
#2 RECOVERY BOILER⁽¹⁾	1.5 lb/ton BLS	1.33 lb/ton BLS	7.25 lb/ton BLS	1.12 lb/ton BLS	0.144 lb/ton BLS	0.013 lb/ton BLS

(1) BLS represents "as-fired" black liquor solids content.

TABLE 3-3
CHAMPION
PENSACOLA, FLA
SUMMARY OF BASELINE EMISSION RATES
JULY 1990 – JUNE 1992
(tons/year)

SOURCE	NO_x	SO_2	CO	PM/PM_{10}	VOC	TRS
#1 POWER BOILER	40.57	0.73	40.57	2.03	31.39	NA
#2 POWER BOILER	113.20	0.49	26.95	1.35	19.47	NA
LIME KILN	63.46	1.76	5.73	57.32	1.68	8.27
#1 RECOVERY BOILER	319.51	283.30	1544.30	238.57	30.67	4.05
#2 RECOVERY BOILER	322.18	285.67	1557.20	240.56	30.93	2.79

- Carbon Monoxide (CO)

  The CO emission factor used is the same emission factor reported in Champion's PSD permit application for the No. 5 Package Boiler submitted in February 1991. This factor was based on testing conducted on Champions No. 5 Package Boiler on 16-17 May 1989. The CO emission factor is 0.1 lb/MMBtu.

- Total Suspended Particulate Matter and Particulate Matter less than 10 microns (PM/PM_{10})

  The PM/PM_{10} emission factor is based on the AP-42 emission factor for natural gas (Table 1.4-1, utility boiler size). This factor is 5 $lb/10^6$ cf. Assuming a natural gas heating value of 1000 Btu/scf, the PM/PM_{10} emission factor is 0.005 lb/MMBtu.

- Volatile Organic Compounds (VOC)

  The VOC emission factor used is based upon the same VOC concentration reported in Champion's PSD permit application for the No. 5 Package Boiler submitted in February 1991. This concentration of 20 ppm (as propane) was established by testing conducted on 16-17 May 1989 and is used in conjunction with volumetric flow rate data from testing on 8 February 1991. The VOC emission factor is 7.82 lb/hr.

3.2.2 **<u>No. 2 Power Boiler</u>**

The No. 2 power boiler has a design heat input rating of 220 MMBtu per hour. The primary fuel fired in the boiler is natural gas. However, the boiler is also equipped to burn

No. 6 fuel oil for emergency use. For the baseline period, natural gas was the only fuel fired and emissions are based on natural gas usage. The following information presents the basis for the selected emission factors for each pollutant.

- Nitrogen Oxides (NO_x)

  The NO_x emission factor is based upon the average NO_x mass emission rates and total heat input rates measured during a series of three test runs conducted on 9 February 1991. The NO_x emission factor is 0.42 lb/MMBtu.

- Sulfur Dioxide (SO_2)

  The SO_2 emission factor is based upon the typical sulfur content of the natural gas burned in the No. 1 power boiler as supplied by the gas vendor and the assumption of 100% conversion to SO_2. The SO_2 emission factor is .0018 lb/MMBtu.

- Carbon Monoxide (CO)

  The CO emission factor used is the same emission factor reported in Champion's PSD permit application for the No. 5 Package Boiler submitted in February 1991. This factor was based on testing conducted on Champion's No. 5 Package Boiler on 16-17 May 1989. The CO emission factor is 0.1 lb/MMBtu.

- Total Suspended Particulate Matter and Particulate Matter less than 10 microns (PM/PM_{10})

  The PM/PM_{10} emission factor is based on the AP-42 emission factor for natural gas (Table 1.4-1, utility boiler size). This factor is 5 $lb/10^6$ cf of natural gas. Assuming a natural gas heating value of 1000 Btu/scf, the PM/PM_{10} emission factor is 0.005 lb/MMBtu.

- Volatile Organic Compounds (VOC)

  The VOC emission factor used is based upon the same VOC concentration reported in Champion's PSD permit application for the No. 5 Package Boiler submitted in February 1991. This concentration of 20 ppm as propane was established by testing conducted 16-17 May 1989 and is used in conjunction with volumetric flow rate data from 9 February 1991. The VOC emission factor is 7.77 lb/hr.

3.2.3 Lime Kiln

The Pensacola lime kiln is rated to produce approximately 320 tons of lime per day. The kiln fires natural gas and has a maximum heat input rate of approximately 123 MMBtu per hour. The kiln is also used to incinerate non-condensible gases (NCG) from the Kraft mill process.

- Nitrogen Oxides (NO_x)

  The NO_x emission factor is based on the average of two series of tests conducted on 13 December 1989 and 11-12 April 1990. The NO_x emission factor is 15.5 lb/hr.

- Sulfur Dioxide (SO_2)

The SO_2 emission factor is an average of four series of tests conducted 26 April, 16 May, 13 December 1989 and 11-12 April 1990. The 16 May 1989 test results included in the average only include the test runs during which all noncondensible gas streams were ducted to the lime kiln. The results included are the most representative of normal kiln operations. The SO_2 emission factor is 0.43 lb/hr.

- Carbon Monoxide (CO)

The CO emission factor is an average of two series of tests conducted on 13 December 1989 and 11-12 April 1990. The CO emission factor is 1.4 lb/hr.

- Total Suspended Particulate Matter and Particulate Matter less than 10 microns (PM/PM_{10})

The PM/PM_{10} emission factor is based on an average of four series of tests conducted 26 April 1989, 12 December 1989, 19 March 1991, and 27 March 1992. The PM/PM_{10} emission factor is 14.0 lb/hr.

- Volatile Organic Compounds (VOC)

The VOC emission factor is based on an average of two series of tests conducted 13 December 1989 and 11-12 April 1990. The VOC emission factor is 0.42 lb/hr.

- Total Reduced Sulfur Compounds (TRS)

  The TRS emission factor is based on the 2-year average CEM data and the average gas stream volumetric flow rate from testing conducted 19 March 1991 and 27 March 1992. The TRS value is assumed to be 100% H_2S for calculating a mass emission rate. The TRS emission factor is 2.02 lb/hr.

3.2.4 No. 1 Recovery Boiler

The No. 1 recovery boiler was manufactured by B&W and is rated to fire up to 111,000 pounds of black liquor solids per hour. The No. 1 recovery boiler emission factors for NO_x, SO_2, CO, and VOC are all based on the upper 95% confidence interval values for a series of tests conducted in February 1989. A total of 25 individual test runs were conducted for NO_x, CO, SO_2, and VOC. This approach to calculating an emission factor for recovery boiler emissions was dictated by the wide variability in the test results. The upper 95% confidence interval value provides a more conservative indication of the potential emission factor for these sources. For PM only six separate test runs were conducted; therefore, the emission factor is based upon the mean test value. The TRS emission rate was based on CEM data for this source.

It is important to note that for some test runs, 0 ppm was reported. In these cases, where a one-hour test average was 0 ppm, one half of the mass rate corresponding to 1 ppm was utilized in the calculations. All of the factors are based upon the pounds of pollutant generated per ton of BLS fired.

- Nitrogen Oxides (NO_x)

  The NO_x emission factor is based on the 95% confidence interval (95% CI) value for the tests conducted 23-24 February 1989. The NO_x emission factor is 1.50 lb/ton BLS.

- Sulfur Dioxide (SO_2)

  The SO_2 emission factor is based on the 95% CI value for the tests conducted 23-24 February 1989. The SO_2 emission factor is 1.33 lb/ton BLS.

- Carbon Monoxide (CO)

  The CO emission factor is based on the 95% CI value for the tests conducted 23-24 February 1989. The CO emission factor is 7.25 lb/ton/BLS.

- Total Suspended Particulate Matter and Particulate Matter less than 10 microns (PM/PM_{10})

  The PM/PM_{10} emission factor is based on the mean value for the tests conducted 23-24 February 1989. The PM/PM_{10} emission factor is 1.12 lb/ton BLS.

- Volatile Organic Compounds (VOC)

  The VOC emission factor is based on the 95% CI value for the tests conducted 23-24 February 1989. The VOC emission factor is 0.144 lb/ton BLS.

- Total Reduced Sulfur Compounds (TRS)

  The TRS emission factor is based on the 2-year average CEM data and the average gas stream volumetric flow rate from stack tests conducted 23-24 February 1989. The TRS value is assumed to be 100% H_2S when calculating a mass emission rate. The TRS emission factor is 0.019 lb/ton BLS.

3.2.5 No. 2 Recovery Boiler

The No. 2 recovery boiler is essentially identical to the No. 1 boiler. It is also a B&W boiler rated to fire up to 111,000 pounds of black liquor solids (BLS) per hour. The emission factors for the No. 2 recovery boiler are based on the same approach and test results as the No. 1 recovery boiler. The TRS emission factor differs from the No. 1 recovery boiler factor because the No. 2 recovery boiler has an independent TRS CEM system. All emission factors are based upon the pounds of pollutant generated per ton of BLS fired.

- Nitrogen Oxides (NO_x)

  The NO_x emission factor is based on the 95% confidence interval (95% CI) value for the tests conducted 23-24 February 1989. The NO_x emission factor is 1.50 lb/ton BLS.

- Sulfur Dioxide (SO_2)

  The SO_2 emission factor is based on the 95% CI value for the tests conducted 23-24 February 1989. The SO_2 emission factor is 1.33 lb/ton BLS.

- Carbon Monoxide (CO)

  The CO emission factor is based on the 95% CI value for the tests conducted 23-24 February 1989. The CO emission factor is 7.25 lb/ton/BLS.

- Total Suspended Particulate Matter and Particulate Matter less than 10 microns (PM/PM_{10})

  The PM/PM_{10} emission factor is based on the mean value for the tests conducted 23-24 February 1989. The PM/PM_{10} emission factor is 1.12 lb/ton BLS.

- Volatile Organic Compounds (VOC)

  The VOC emission factor is based on the 95% CI value for the tests conducted 23-24 February 1989. The VOC emission factor is 0.144 lb/ton BLS.

- Total Reduced Sulfur Compounds (TRS)

  The TRS emission factor is based on the 2-year average CEM data and the average gas stream volumetric flow rate from tests conducted 19 March 1991 and 27 March 1992. The TRS value is assumed to be 100% H_2S for calculating a mass emission rate. The TRS emission factor is 0.013 lb/ton BLS.

APPENDIX A

APPENDIX A

CHAMPION - PENSACOLA
SUMMARY OF EMISSION FACTORS
BASELINE EMISSIONS

#1 POWER BOILER

- NO_x - Stack test 2/91 (Appendix B, pg. B-2), 3 test runs conducted and the NO_x emission rate reported for each run was 0.10 lbs/MMBtu, the average emission rate was 0.10 lb/MMBtu.

Emission Factor = 0.10 lb/MMBtu

- SO_2 - Natural gas sulfur content reported as 10.7 ppm by weight (Appendix B, pg. B-3). SO_2 emission factor calculated as follows:

$$\frac{10.7 \text{ parts S}}{1 \times 10^6 \text{ ft}^3 \text{ N.G.}} \times \frac{32 \text{ lbs}}{\text{lb-mole}} \times \frac{1 \text{ lb-mole}}{385.35 \text{ ft}^3} = \frac{0.89 \text{ lbs S}}{1 \times 10^6 \text{ ft}^3 \text{ N.G.}}$$

assume 1,000 BTU/ft^3 N.G.

$$\frac{.89 \text{ lbs S}}{1 \times 10^6 \text{ ft}^3 \text{ N.G.}} \times \frac{\text{ft}^3 \text{ N.G.}}{1{,}000 \text{ BTU}} \times \frac{64 \text{ lbs-moles SO}_2}{32 \text{ lbs-moles S}} =$$

$$\frac{.0018 \text{ lbs SO}_2}{\text{MMBtu}}$$

Emission Factor = 0.0018 lb/MMBtu

- CO - PSD Permit Application for Proposed Package Boiler - Pensacola 2/91, (Appendix B, pg. B-4)

Emission Factor = 0.1 lb/MMBtu

- PM/PM_{10} - The AP-42 emission factor estimate for PM/PM10 for utility boilers burning natural gas (Appendix B, pg. B-5) is 5 lbs per 10^6 ft^3 of natural gas. Assuming 1,000 BTU per ft^3, the PM/PM10 emission factor is calculated as follows:

$$\frac{5 \text{ lbs PM/PM10}}{1 \times 10^6 \text{ ft}^3 \text{ N.G.}} \times \frac{1 \text{ ft}^3 \text{ N.G.}}{1{,}000 \text{ BTU}} = \frac{.005 \text{ lbs PM/PM10}}{\text{MMBtu}}$$

Emission Factor = 0.005 lb/MMBtu

- VOC

11-5-92
will resubmit

Emission Factor = 7.82 lb/hr

Emission Factor Based on 20 ppm and 5.71 x 10^4 dscfm - PSD Permit App - Pensacola 2/91, Appendix B, pg. B-7
- Stack Test 2/91

$$\frac{\text{lb}}{\text{hr}} = \frac{\text{ppm}}{385.35 \times 10^6} \times Q_{\text{dscfm}} \times \frac{60 \text{ min}}{\text{hr}} \times \text{MW}$$

Where:

385.35×10^6 = A conversion factor relating cf/l (0.03531), g/lb (453.6), l/g-mole (24.06), and ppm (10^6)

44 = Molecular Weight as Propane

$$= \frac{20 \text{ ppm}}{385.35 \times 10^6} \times (5.71 \times 10^4) \times 60 \times 44 = 7.82 \text{ lb/hr}$$

= 7.82 lb/hr

#2 POWER BOILER

- NO_x - Results of three separate NO_x emission test runs during 2/91 were 0.40 lb/MMBtu, 0.42 lb/MMBtu and 0.44 lb/MMBtu. Mean value from the testing was 0.42 lb/MMBtu (Appendix B, pg. B-6).

  Emission Factor = 0.42 lb/MMBtu

- SO_2 - Natural gas sulfur content reported as 10.7 ppm by weight (Appendix B, pg. B-3). SO_2 emission factor calculated as above for #1 Power Boiler.

  Emission Factor = 0.0018 lb/MMBtu

- CO - PSD Permit Application for Proposed Package Boiler - Pensacola 2/91, (Appendix B, pg. B-4).

  Emission Factor = 0.1 lb/MMBtu

- PM/PM_{10} - The AP-42 emission factor estimate for PM/PM10 from utility boilers burning natural gas (Appendix B, pg. B-5) is 5 lbs per 10^6 ft^3 of natural gas. Assuming 1,000 BTU per ft^3, the PM/PM10 emission factor is calculated as above for #1 Power Boiler.

  Emission Factor = 0.005 lb/MMBtu

- VOC 11-5-92 will resubmit

  Emission Factor = 7.77 lb/hr

  Emission Factor Based on 20 ppm and 5.67×10^4 dscfm - PSD Permit App - Pensacola 2/91, Appendix B, pg. B-7
  - Stack Test 2/91

  Where:

  385.35×10^6 = A conversion factor relating cf/l (0.03531), g/lb (453.6), l/g-mole (24.06), and ppm (10^6)

  44 = molecular weight as propane

$$\frac{lb}{hr} = \frac{20 \text{ ppm}}{385.35 \times 10^6} \times (5.67 \times 10^4) \times 60 \times 44 = 7.77 \text{ lb/hr}$$

Emission Factor = 7.77 lb/hr

LIME KILN

- NO_x - The NO_x emission factor is based upon the average NO_x emission rate from seven one-hour tests conducted December 1989 and one twelve-hour test conducted in April 1990. (Appendix B, pgs. B-8 and B-9)

Average

14.2 lb/hr	Stack Test	12/89
16.8 lb/hr	Stack Test	4/90

Emission Factor = 15.5 lb/hr

- SO_2 - The SO_2 emission factor is based upon the average of four series of tests as indicated below (Appendix B, pgs. B-8, B-9, B-10, and B-11)

Average

0.2 lb/hr	Stack Test	4/89
0.7 lb/hr	Stack Test	5/89
0.1 lb/hr	Stack Test	12/89
0.7 lb/hr	Stack Test	4/90

Emission Factor = 0.43 lb/hr

- CO - The CO emission factor is based upon the average of two series of tests as indicated below (Appendix B, pgs. B-8, B-9)

Average

1.0 lb/hr	Stack Test	12/89
1.8 lb/hr	Stack Test	4/90

Emission Factor = 1.4 lb/hr

- PM/PM_{10} - The PM/PM10 emission factor is based upon four series of stack tests as indicated below (Appendix B, pgs. B-10, B-12, B-13, and B-14)

Average

10.8 lb/hr	Stack Test	4/89
23.2 lb/hr	Stack Test	12/89
14.8 lb/hr	Stack Test	3/91
7.2 lb/hr	Stack Test	3/92

Emission Factor = 14.0 lb/hr

- VOC - The VOC emission factor is based upon two series of stack tests as indicated below (Appendix B, pgs. B-8 and B-9)

Average (As Propane)

0.700 lb/hr	Stack Test	12/89
0.119 lb/hr	Stack Test	4/90

Average Emission Factor = 0.41 lb/hr as propane

- TRS

Emission Factor = 2.02 lb/hr

Emission Factor Based on 12.8 ppm @ 10% O_2 - 2-year average based on CEM data using average gas stream volumetric flow data from stack tests in March 91 and March 92 (Appendix B, pgs. B-13 and B-14)

27,100 dscfm @ 8.9% O_2

$$27{,}100 \text{ dscfm} \times \left[\frac{20.9 - 8.9}{20.9 - 10}\right] = 29{,}835 \text{ dscfm @ } 10\% \ O_2$$

Where:

20.9 = O_2 concentration at standard conditions

$$\frac{lb}{hr} = \frac{ppm}{385.35 \times 10^6} \times Q_{dscfm} \times \frac{60 \text{ min}}{hr} \times MW$$

Where:

385.35×10^6 = A conversion factor relating cf/l (0.03531), g/lb (453.6), l/g-mole (24.06), and ppm (10^6)

$$= 12.8 \text{ ppm} \times \frac{29{,}835 \text{ dscfm}}{385.35 \times 10^6} \times 34 \times 60 = 2.02 \text{ lb/hr}$$

$$= 2.02 \text{ lb/hr}^2 \textit{ as } H_2S$$

#1 RECOVERY BOILER

- NO_x - The emission factor is based upon the results of the February 1989 stack tests (Appendix B, pg. B-15 and B-16) and the 95% confidence interval value as determined in Table A-1. All tests were conducted at 260 gpm BLS firing rate.

Black Liquor Solids Firing Rate

$$= \frac{260 \text{ gal as-fired Black Liquor}}{\text{min}} \times \frac{11.2 \text{ lb Black Liquor}}{\text{gal Black Liquor}} \times \frac{60 \text{ min}}{\text{hr}} \times (0.65)$$

= 113,568 lb as-fired BLS/hr = 56.78 tons BLS/hr = 1.50 lb NO_x/ton BLS

0.65 = Solids Fraction in Black Liquor

85.3 lbs/hr NO_x ÷ 56.78 tons BLS/hr = 1.5 lb/ton BLS

Emission Factor = 1.50 lb/ton BLS

- SO_2 - The emission factor is based upon the results of the February 1989 stack tests (Appendix B, pg. B-15 and B-16), and the 95% confidence interval value as determined in Table A-1. All tests were conducted at 260 gpm BLS firing rate.

$$\frac{\dfrac{75.4 \text{ lb } SO_2}{\text{hr}}}{\dfrac{56.78 \text{ tons BLS}}{\text{hr}}} = 1.33 \text{ lb/ton BLS}$$

Emission Factor = 1.33 lb/ton BLS

- CO - The emission factor is based upon the results of the February 1989 stack tests, the 95% confidence interval value as determined in Table A-1. All tests were conducted at 260 gpm BLS firing rate. (Appendix B, pg. B-15 and B-16)

$$\frac{\frac{411.6 \text{ lb CO}}{\text{hr}}}{\frac{56.78 \text{ tons BLS}}{\text{hr}}} = 7.25 \text{ lb/ton BLS}$$

Emission Factor = 7.25 lb/ton BLS

- PM/PM_{10} - The emission factor is based upon the average PM/PM10 emission rate for the stack tests conducted February 1989 (Appendix B, pg. B-17)

63.4 lb/hr @ 260 gpm BLS

$$\frac{\frac{63.4 \text{ lb PM/PM10}}{\text{hr}}}{\frac{56.78 \text{ tons BLS}}{\text{hr}}} = 1.12 \text{ lb/ton BLS}$$

Emission Factor = 1.12 lb/ton BLS

- VOC - The emission factor is based upon the results of the February 1989 stack tests (Appendix B, pg. B-15 and B-16), and the 95% confidence interval value as determined in Table A-1. All tests were conducted at 260 gpm BLS firing rate.

$$\frac{\frac{8.2 \text{ lb VOC}}{\text{hr}}}{\frac{56.78 \text{ tons BLS}}{\text{hr}}} = 0.144 \text{ lb/ton BLS}$$

Emission Factor = 0.144 lb/ton BLS

- TRS

Emission Factor = 0.019 lb TRS/ton BLS

Emission factor based on 1.3 ppm @ 8% O_2 - 2 yr average based on CEM data.

Using average flow data from Stack Test 2/89 (Appendix B, pg. B-17)

139,000 dscfm @ 6.4% O_2 and 113, 568 lb BLS/hr

$$\frac{139{,}000\ \text{dscf}}{\text{min}} \times \left[\frac{20.9\ -\ 6.4}{20.9\ -\ 8}\right] = 156{,}240\ \text{dscfm @ } 8\%\ O_2$$

Where:

20.9 = O_2 concentration @ standard conditions

$$\frac{\text{lb}}{\text{hr}} = \frac{\text{ppm}}{385.35 \times 10^6} \times Q_{\text{dscfm}} \times \frac{60\ \text{min}}{\text{hr}} \times \text{MW}$$

Where:

385.35×10^6 = A conversion factor relating cf/l (0.03531), g/lb (453.6), l/g-mole (24.06), and ppm (10^6)

$$1.3\ \text{ppm @ } 8\%\ O_2 \times \frac{156{,}240\ \text{dscfm}}{385.35 \times 10^6} \times 34 \times 60 = 1.08\ \text{lb/hr}^2$$

$$\frac{\dfrac{1.08\ \text{lb TRS}}{\text{hr}}}{\dfrac{56.78\ \text{tons BLS}}{\text{hr}}} = 0.019\ \text{lb/ton BLS}$$

#2 RECOVERY BOILER

- NO_x - The emission factor is based upon the results of the February 1989 stack tests (Appendix B, pg. B-15 and B-16), and the 95% confidence interval value as determined in Table A-1. All tests were conducted at 260 gpm BLS firing rate.

Black Liquor Solids Firing Rate

$$= \frac{260\ \text{gal as-fired Black Liquor}}{\text{min}} \times \frac{11.2\ \text{lb Black Liquor}}{\text{gal Black Liquor}} \times \frac{60\ \text{min}}{\text{hr}} \times (0.65)$$

$$= 113{,}568\ \text{lb as-fired BLS/hr} = 56.78\ \text{tons BLS/hr} = 1.50\ \text{lb } NO_x/\text{ton BLS}$$

0.65 = Solids Fraction in Black Liquor

85.3 lbs/hr NO_x ÷ 56.78 tons BLS/hr = 1.5 lb/ton BLS

Emission Factor = 1.50 lb/ton BLS

- SO_2 - The emission factor is based upon the results of the February 1989 stack tests (Appendix B, pg. B-15 and B-16), and the 95% confidence interval value as determined in Table A-1. All tests were conducted at 260 gpm BLS firing rate.

$$\frac{\frac{75.4 \text{ lb } SO_2}{\text{hr}}}{\frac{56.78 \text{ tons BLS}}{\text{hr}}} = 1.33 \text{ lb/ton BLS}$$

Emission Factor = 1.33 lb/ton BLS

- CO - The emission factor is based upon the results of the February 1989 stack tests (Appendix B, pg. B-15 and B-16), and the 95% confidence interval value as determined in Table A-1. All tests were conducted at 260 gpm BLS firing rate.

$$\frac{\frac{411.6 \text{ lb CO}}{\text{hr}}}{\frac{56.78 \text{ tons BLS}}{\text{hr}}} = 7.25 \text{ lb/ton BLS}$$

Emission Factor = 7.25 lb/ton BLS

- PM/PM_{10} - The emission factor is based upon the average PM/PM10 emission rate for the stack tests conducted February 1989 (Appendix B, pg. B-17)

63.4 lb/hr @ 260 gpm BL Stack Test 2/89

$$\frac{\frac{63.4 \text{ lb PM/PM10}}{\text{hr}}}{\frac{56.78 \text{ tons BLS}}{\text{hr}}} = 1.12 \text{ lb/ton BLS}$$

Average Emission Factor = 1.12 lb/ton BLS

- VOC - The emission factor is based upon the results of the February 1989 stack tests (Appendix B, pg. B-15 and B-16), and the 95% confidence interval value as determined in Table A-1. All tests were conducted at 260 gpm BLS firing rate.

$$\frac{\frac{8.2 \text{ lb VOC}}{\text{hr}}}{\frac{56.78 \text{ tons BLS}}{\text{hr}}} = 0.144 \text{ lb/ton BLS}$$

Emission Factor = 0.144 lb/ton BLS

- TRS

Emission Factor = 0.013 lb/ton BLS

Emission factor based on 0.9 ppm @ 8.1% O_2 - 2 yr average based on CEM data.

Using Average gas stream volumetric flow data from stack tests in March 91 and March 92 (Appendix B, pg. B-18 and B-19)

131,000 dscfm @ 8% O_2 and 96406 lb BLS/hr

$$\frac{131{,}000 \text{ dscf}}{\text{min}} \times \left[\frac{20.9 - 8.1}{20.9 - 8}\right] = 129{,}985 \text{ dscfm @ } 8\% \ O_2$$

Where:

20.9 = O_2 concentration @ standard conditions

$$\frac{\text{lb}}{\text{hr}} = \frac{\text{ppm}}{385.35 \times 10^6} \times Q_{\text{dscfm}} \times \frac{60 \text{ min}}{\text{hr}} \times \text{MW}$$

Where:

385.35×10^6 = A conversion factor relating cf/l (0.03531), g/lb (453.6), l/g-mole (24.06), and ppm (10^6)

$$0.9 \text{ ppm} \times \frac{129{,}985 \text{ dscfm}}{385.35 \times 10^6} \times 34 \times 60 = 0.62 \text{ lb/hr}^2$$

$$\frac{\frac{0.62 \text{ lb}}{\text{hr}}}{\frac{48.20 \text{ tons BLS}}{\text{hr}}} = 0.013 \text{ lb/ton BLS}$$

TABLE A-1
CHAMPION PAPER
PENSACOLA, FLA
SUMMARY OF EMISSION FACTORS USING A 95% CONFIDENCE INTERVAL

NO_x

n = 25 t = 1.711

x = 74.9 95% Confidence Interval = 74.9 + (1.711 * 6.08) = **85.3 #/hr**

1.50 #/ton BLS

s = 6.08

CO

n = 25 t = 1.711

x = 158.2 95% Confidence Interval = 158.2 + (1.711 * 148.1) = **411.6 #/hr**

7.25 #/ton BLS

s = 148.1

SO_2

n = 25 t = 1.711

x = 28.0 95% Confidence Interval = 28.0 + (1.711 * 27.7) = **75.4 #/hr**

1.33 #/ton BLS

s = 27.7

VOC

n = 25 t = 1.711

x = 3.1 95% Confidence Interval = 3.1 + (1.711 * 2.96) = **8.2 #/hr**

0.14 #/ton BLS

s = 2.96

where:

n = number of test runs

x = mean test value

s = standard deviation

TABLE A-2

CHAMPION PAPER

PENSACOLA, FLA

SUMMARY OF FUEL USAGE AND BLS FIRING RATES

BASELINE EMISSIONS

	#1 POWER BOILER NAT GAS MCF	#2 POWER BOILER NAT GAS MCF	#1 RECOVERY BOILER NAT GAS MCF	#1 RECOVERY BOILER BLS TONS	#2 RECOVERY BOILER NAT GAS MCF	#2 RECOVERY BOILER BLS TONS	LIME KILN NAT GAS MCF
JULY 1990 – JUNE 1991							
JULY	68255	29824	3791	28250	11378	39500	66014
AUGUST	59233	23397	4387	31250	2601	35000	38205
SEPTEMBER	17573	36018	942	37500	3758	35750	59954
OCTOBER	22428	72631	5367	37000	5713	35500	59954
NOVEMBER	60138	79234	677	37500	3115	10750	48243
DECEMBER	72004	23764	3131	38250	4604	39400	71857
JANUARY	77658	20639	4278	36687	4795	40505	68545
FEBUARY	62558	20639	2914	36240	3074	34701	60673
MARCH	79126	25355	6410	27100	4449	35151	55633
APRIL	70618	79987	7737	37115	6695	37411	67532
MAY	78319	11796	6303	36932	8707	32162	64778
JUNE	77987	15617	5749	35543	5330	39439	62870
TOTAL	745897	438901	51686	419367	64219	415269	724258
JULY 1991 – JUNE 1992							
JULY	85896	12759	1936	35990	2885	39333	60628
AUGUST	90188	18899	4420	39632	4253	39212	60054
SEPTEMBER	84396	31455	4201	32887	4081	38109	51897
OCTOBER	85672	28729	2057	38166	4268	38952	61132
NOVEMBER	77255	86364	3058	36070	3607	31551	56137
DECEMBER	82502	90904	3574	36524	3002	38640	55669
JANUARY	79989	90904	1101	38541	4780	38514	58747
FEBUARY	60252	58326	4385	27542	2087	33818	44198
MARCH	56035	49474	1022	36658	4596	38177	62085
APRIL	58854	57331	2207	36403	5719	31902	56431
MAY	54785	52559	1609	38673	3444	38057	60342
JUNE	61189	61473	3462	35577	6958	37610	56258
TOTAL	877013	639177	33032	432663	49680	443875	683578

TABLE A-3
CHAMPION PAPER
PENSACOLA, FLA
SUMMARY OF HOURS OF OPERATION AND PULP PRODUCTION
BASELINE EMISSIONS

	#1 POWER BOILER (hrs)	#2 POWER BOILER (hrs)	#1 RECOVERY BOILER (hrs)	#2 RECOVERY BOILER (hrs)	LIME KILN (hrs)	PULP PRODUCTION (ADUBT)[1]
JULY 1990 – JUNE 1991						
JULY	711	198	744	744	729	47241
AUGUST	741	198	624	744	570	42326
SEPTEMBER	245	477	715	713	675	45529
OCTOBER	194	685	732	670	735	45041
NOVEMBER	615	712	223	714	556	34893
DECEMBER	741	222	744	743	717	46414
JANUARY	707	172	697	744	716	42526
FEBUARY	625	97	671	662	643	39572
MARCH	737	217	606	741	599	40226
APRIL	635	420	713	700	713	43182
MAY	742	88	711	650	722	40742
JUNE	717	133	701	720	697	43545
TOTAL	7410	3619	7881	8545	8072	511237
JULY 1991 – JUNE 1992						
JULY	730	107	709	737	738	44294
AUGUST	737	141	744	740	731	44609
SEPTEMBER	709	232	632	700	601	39708
OCTOBER	744	191	743	734	735	42609
NOVEMBER	642	638	710	580	704	38935
DECEMBER	744	740	727	744	720	42650
JANUARY	718	744	743	744	732	45379
FEBUARY	696	696	564	692	556	38878
MARCH	744	732	739	727	736	46554
APRIL	720	720	711	617	709	42500
MAY	744	743	736	734	729	46388
JUNE	718	720	687	720	614	42838
TOTAL	8646	6404	8445	8469	8305	515342

[1] ADUBT – AIR DRIED UNBLEACHED TONS

TABLE A-4
CHAMPION
PENSACOLA, FLA
SUMMARY OF ACTUAL EMISSIONS

JULY 1990 – JUNE 1991

SOURCE	NO_x	SO_2	CO	PM/PM_{10}	VOC	TRS
#1 POWER BOILER	37.29 tons	0.67 tons	37.29 tons	1.86 tons	28.97 tons	NA
#2 POWER BOILER	92.17 tons	0.40 tons	21.95 tons	1.10 tons	14.06 tons	NA
LIME KILN	62.56 tons	1.74 tons	5.65 tons	56.50 tons	1.65 tons	8.15 tons
#1 RECOVERY BOILER	314.53 tons	278.88 tons	1520.21 tons	234.85 tons	30.19 tons	3.98 tons
#2 RECOVERY BOILER	311.45 tons	276.15 tons	1505.35 tons	232.55 tons	29.90 tons	2.70 tons
TOTAL	818.00 tons	557.83 tons	3090.45 tons	526.86 tons	104.78 tons	14.84 tons

TABLE A-5
CHAMPION
PENSACOLA, FLA
SUMMARY OF ACTUAL EMISSIONS

JULY 1991 – JUNE 1992

SOURCE	NO_x	SO_2	CO	PM/PM_{10}	VOC	TRS
#1 POWER BOILER	43.85 tons	0.79 tons	43.85 tons	2.19 tons	33.80 tons	NA
#2 POWER BOILER	134.23 tons	0.58 tons	31.96 tons	1.60 tons	24.88 tons	NA
LIME KILN	64.36 tons	1.79 tons	5.81 tons	58.13 tons	1.70 tons	8.39 tons
#1 RECOVERY BOILER	324.50 tons	287.72 tons	1568.40 tons	242.29 tons	31.15 tons	4.11 tons
#2 RECOVERY BOILER	332.91 tons	295.18 tons	1609.05 tons	248.57 tons	31.96 tons	2.89 tons
TOTAL	899.84 tons	586.05 tons	3259.07 tons	552.78 tons	123.50 tons	15.38 tons

APPENDIX B

SECTION 2. RESULTS AND DISCUSSION

Emission testing on the No. 1 and No. 2 Power Boilers was performed on 08 and 09 February 1991. The results of this testing are summarized in Tables 2.1 and 2.2. Field and process data are located in Appendices B, C, and D, respectively. Sample calculations are illustrated in Appendix E.

TABLE 2.1. SUMMARY OF NO_x EMISSION - NO. 1 POWER BOILER

	RUN 1	RUN 2	RUN 3	MEAN
Date	02/08/91	02/08/91	02/08/91	----
Time Begin	1246	1417	1545	----
Time Ended	1346	1517	1645	----
Stack Gas				
Temperature, °F	485	486	490	487
Velocity, ft/sec	47.9	52.7	52.3	51.0
Moisture, %	5.4	5.4	5.4	5.4
Oxygen, %	9.8	9.9	9.8	9.8
Carbon Dioxide, %	5.9	5.9	6.1	6.0
Volumetric Flow Rate				
at Stack Conditions, x 10^5 ft^3/min	0.98	1.08	1.07	1.04
at Standard Conditions, x 10^4 ft^3/min	5.19	5.71	5.65	5.5
Nitrogen Oxides				
Concentration, ppm	31	29	28	29
Emission Rate, lb/hr	11.5	11.9	11.3	11.6
Emission Rate, lb/mmBTU	0.10	0.10	0.10	0.10

Champion
Champion International Corporation

DATE 8/23 TIME 4:30 NO OF PAGES 2

TO: John Egan FROM: Steve Webb

LOCATION: LOCATION:

COMMENTS: Total S component analysis from one of our suppliers.
Other component analysis included as well —

FC-1129

PETROLEUM ANALYST INC.

ANALYTICAL CONSULTANTS

GAS ANALYSIS REPORT NO: 007-050892-02 DATE: 05-08-92

FOR: FIVE FLAGS PIPELINE
ATTN: MR. N. SMITH
P.O. BOX 1062
PACE FL 32570

SAMPLE IDENTIFICATION:
COMPANY: FIVE FLAGS PIPELINE
FIELD: PACE FLORIDA
LEASE: CHAMPION

SAMPLE DATA: DATE: 04-29-92 BY: N. SMITH
PSIG: 68 TEMP: DEG.F. GRAV:
MCF/D: DIF: IN. DP: LBS H2O

REMARKS: COMPOSITE SAMPLE FROM 03-30-92 TO 04-29-92.

CYL. # 1024

COMPONENT ANALYSIS

TOTAL SULFUR = 10.7 PPM (BY WEIGHT)

Post-it™ brand fax transmittal memo 7671 # of pages ▸ 1

To Steve Webb
From Nathan Smith
Co. Champion
Co. ive Flags Pipeline
Dept.

PSD Permit Application for A Proposed Package Boiler

Champion International Corporation Pensacola Florida Mill

February 1991

2.5 Other Criteria Pollutants

A summary of the expected emission rates from the No. 5 Package Boiler of particulate matter, PM-10, sulfur dioxide, carbon monoxide, and hydrocarbons is presented in Table 2-2. The emissions of the above criteria pollutants are less than the PSD threshold levels requiring new source review.

Particulate matter emissions were derived using Table 1.4-1, Uncontrolled Emission Factors for Natural Gas Combustion in U.S. EPA Publication AP-42. A conservative factor for utility boilers of 5 lbs per million cubic feet of natural gas was used. Based on the maximum heat input of 195 MMBtu/hr and 8,760 hours of operation per year maximum hourly and annual particulate matter emissions are 0.98 lbs/hr and 4.3 tons/year respectively. All of the particulate matter generated is assumed to be PM-10.

Sulfur dioxide emissions were derived using Table 1.4-1, Uncontrolled Emission Factors for Natural Gas Combustion in U.S. EPA Publication AP-42. A conservative factor for utility boilers of 0.60 lbs per million cubic feet of natural gas was used. Based on the maximum heat input of 195 MMBtu/hr and 8,760 hours of operation per year, maximum hourly and annual sulfur dioxide emissions are estimated to be 0.12 lbs/hr and 0.53 tons/year respectively.

The carbon monoxide emission rate in Table 2-2 was derived from actual emission tests conducted on the No. 5 Package Boiler in May of 1989. Based on a "worst case" measured mass emission rate approximately 0.1 pounds of CO per MMBtu, a maximum heat input of 195 MMBtu/hr and 8,760 hours of operation per year, annual CO emissions are estimated to be 85.41 tons/year.

TABLE 1.4-1. UNCONTROLLED EMISSION FACTORS FOR NATURAL GAS COMBUSTION[a]

Furnace Size & Type (10^6 Btu/hr heat input)	Particulates[b]		Sulfur Dioxide[c]		Nitrogen Oxide[d,e]		Carbon Monoxide[f,g]		Volatile Organics			
									Nonmethane		Methane	
	$kg/10^6 m^3$	$lb/10^6 ft^3$	$kg/10^6 m^3$	$lb/10^6 ft^3$	$kg/10^6 m^3$	$lb/10^6 ft^3$	$kg/10^6 m^3$	$lb/10^6 ft^3$	$kg/10^6 m^3$	$lb/10^6 ft^3$	$kg/10^6 m^3$	$lb/10^6 ft^3$
Utility boilers (>100)	16-80	1-5	9.6	0.6	8800[h]	550[h]	640	40	23	1.4	4.8	0.3
Industrial boilers (10 - 100)	16-80	1-5	9.6	0.6	2240	140	560	35	44	2.8	48	3
Domestic and commercial boilers (<10)	16-80	1-5	9.6	0.6	1600	100	320	20	84	5.3	43	2.7

[a] All emission factors are expressed as weight per volume fuel fired.

[b] References 15-18.

[c] Reference 4 (based on an average sulfur content of natural gas of 4600 $g/10^6 Nm^3$ (2000 $gr/10^6$ scf).

[d] References 4-5,7-8,11,14,18-19,21.

[e] Expressed as NO_2. Test results indicate that about 95 weight % of NO_x is NO.

[f] References 4,7-8,16,18,22-25.

[g] References 16 and 18. May increase 10 to 100 times with improper operation or maintenance.

[h] Use 4400 $kg/10^6 m^3$ (275 $lb/10^6 ft^3$) for tangentially fired units. At reduced loads, multiply this factor by the load reduction coefficient given in Figure 1.4-1. See text for potential NO_x reductions by combustion modifications. Note that the NO_x reduction from these modifications will also occur at reduced load conditions.

TABLE 2.2. SUMMARY OF NO_x EMISSION - NO. 2 POWER BOILER

	RUN 1	RUN 2	RUN 3	MEAN
Date	02/09/91	02/09/91	02/09/91	----
Time Begin	0938	1100	1221	----
Time Ended	1039	1200	1321	----
Stack Gas				
Temperature, °F	373	379	382	378
Velocity, ft/sec	43.5	44.1	47.0	44.9
Moisture, %	6.1	6.1	6.1	6.1
Oxygen, %	9.5	9.4	9.5	9.5
Carbon Dioxide, %	6.5	6.4	6.5	6.5
Volumetric Flow Rate				
at Stack Conditions, x 10^4 ft^3/min	8.88	9.00	9.60	9.16
at Standard Conditions, x 10^4 ft^3/min	5.30	5.34	5.67	5.44
Nitrogen Oxides				
Concentration, ppm	173	179	178	177
Emission Rate, lb/hr	66	69	72	69
Emission Rate, lb/mmBTU	0.40	0.42	0.44	0.42

The hydrocarbon emission rate in Table 2-2 was derived from actual emission tests conducted on the No. 5 Package Boiler in May of 1989. Based on a measured hydrocarbon concentration of 20 ppm (vol, dry), a volumetric flow rate of 33,000 dscfm (0°C, 1 atm) and 8,760 hours of operation per year, the hourly and annual hydrocarbon emissions are estimated to be 1.8 lbs/hr and 7.9 tons/year respectively.

PSD Permit Application for A Proposed Package Boiler

Champion International Corporation
Pensacola Florida Mill

February 1991

TABLE 2.3. ONE HOUR SUMMARY OF O_2, CO, NO_x, SO_2, AND THC EMISSION, LIME KILN

	TIME PERIOD							
	1	2	3	4	5	6	7	AVG
Date[a]	12/13	12/13	12/13	12/13	12/13	12/13	12/13	---
Time Began	1201	1300	1400	1500	1600	1700	1800	---
Time Ended	1259	1359	1459	1559	1659	1759	1859	---
Volumetric Flow Rate x 10^4 ft^3/min at Standard Conditions	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72
Carbon Dioxide Concentration, %	16.6	17.2	17.9	14.9	18.4	16.7	17.5	17.0
Oxygen Concentration, %	6.0	5.9	5.7	7.7	5.6	6.9	6.2	6.3
Carbon Monoxide								
Concentration, ppm	11.0	8	8	7	9	9	9	9
Emission Rate, lb/hr	1.3	1.0	1.0	0.9	1.1	1.0	1.0	1.0
Nitrogen Oxides[b]								
Concentration, ppm	76	72	73	70	72	70	73	72
Emission Rate, lb/hr	14.8	14.1	14.2	13.6	14.1	13.6	14.8	14.2
Sulfur Dioxide								
Concentration, ppm	1	<1	1	0	0	0	0	<1
Emission Rate, lb/hr	0.3	0.1	0.2	0.0	0.0	0.0	0.0	0.1
Total Hydrocarbons[c]								
Concentration, ppm	5	7	7	2	2	1	2	4
Emission Rate, lb/hr	0.9	1.2	1.3	0.4	0.3	0.2	0.3	0.7

[a] 1989.

[b] as NO_x.

[c] as propane.

II. **SUMMARY**

Tabulated below are data collected on the Lime Kiln emissions during testing on April 11-12, 1990.

CHAMPION INTERNATIONAL CORPORATION

LIME KILN

PARAMETER	PERMIT LIMIT	RUN 1 (12 hr avg.)
DATE		4/11-12/90
TIME		1720-2104 2251- 728
SULFUR DIOXIDE		
(PPM)		2.08
(lb/hr)		0.666
OXIDES OF NITROGEN		
(PPM)		73.08
(lb/hr)		16.791
CARBON MONOXIDE		
(PPM)		12.95
(lb/hr)		1.811
TOTAL HYDROCARBON**		
(PPM)		1.63
(lb/hr)		0.131
OPERATING RATE		
(ton lime mud/hr)	24.5	na
OXYGEN - test monitor		
(%)		6.84
STACK GAS DATA - *		
TEMPERATURE, F		182
MOISTURE, %		38.10
VELOCITY, ft/ sec		31.37
FLOW RATE, ACFM		62460.8
, DSCFM		32049.7

* - Average of three particulate tests conducted on 4-11-90

** - AS METHANE

SECTION 2.

RESULTS AND DISCUSSION

2.1. LIME KILN

Emission testing on the Lime Kiln was performed on 26 April 1989. The results of this testing are summarized in Tables 2.1 and 2.2. Supporting field, process, and laboratory data are provided in Appendices B and C, respectively. Example calculations are illustrated in Appendix F.

TABLE 2.1

LIME KILN
SUMMARY OF PARTICULATE, NITROGEN OXIDES,
AND SULFUR DIOXIDE EMISSIONS

	RUN 1	RUN 2	RUN 3	MEAN
Date	4/26/89	4/26/89	4/26/89	----
Time Began	1028	1220	1423	----
Time Ended	1132	1329	1525	----
Stack Gas				
Temperature, °F	172	170	172	171
Velocity, ft/sec	24.4	23.4	24.4	24.1
Moisture, %	41.1	37.6	38.7	39.2
Oxygen, %	6.7	4.8	5.0	5.5
Carbon Dioxide, %	16.0	18.9	17.8	17.6
Volumetric Flow Rate				
At Stack Conditions x 10^4 ft^3/min	4.85	4.66	4.87	4.79
At Standard Conditions x 10^4 ft^3/min	2.40	2.45	2.50	2.45
Particulate				
Isokinetic Sampling Rate, %	87	90	93	90
Concentration[a], gr/ft^3	0.071	0.050	0.035	0.052
Emission Rate, lb/hr	14.6	10.4	7.4	10.8
Allowable Limit, lb/hr	----	----	----	26.1
Nitrogen Oxides				
Concentration[a], ppm	82	82	81	82
Emission Rate, lb/hr	14.1	14.4	14.5	14.3
Sulfur Dioxide				
Concentration[a], ppm	1.1	0.2	0.2	0.5
Emission Rate, lb/hr	0.3	0.1	0.1	0.2

[a] At standard conditions 68° F and 29.92 inches of mercury.

2.2. LIME KILN CONDITION 1 - ALL NGC SOURCES

Sulfur Dioxide testing on the Lime Kiln with All NCG Sources feed was performed on 16 May 1989. The results of this testing are summarized in Table 2.2. Supporting field and laboratory data are provided in Appendix B. Example calculations are illustrated in Appendix I.

TABLE 2.2

SUMMARY OF EMISSIONS - LIME KILN CONDITION 1
ALL NCG SOURCES

	RUN 1	RUN 2	RUN 3	MEAN
Date	5/16/89	5/16/89	5/16/8	---
Time Began	1000	1108	1200	---
Time Ended	1030	1138	1230	---
Stack Gas				
Temperature, °F	166	166	166	166
Velocity, ft/sec	20.9	21.1	20.7	20.9
Moisture, %	37.2	37.2	37.2	37.2
Oxygen, %	19.0	19.0	18.0	18.7
Carbon Dioxide, %	6.0	6.5	4.5	5.7
Volumetric Flow Rate				
At Stack Conditions $\times 10^4$ ft^3/min	4.16	4.21	4.13	4.17
At Standard Conditions $\times 10^4$ ft^3/min	2.21	2.23	2.19	2.21
Sulfur Dioxide				
Concentration[a], ppm	4.4	3.3	2.4	3.3
Emission Rate, lb/hr	1.0	0.7	0.5	0.7

---

[a] At standard condition - 68° F and 29.92 inches of mercury.

2.2. LIME KILN

This section summarizes the results of the emission testing on the lime kiln. Table 2.2 summarizes the three one-hour particulate emission tests performed at the outlet of the kiln. Table 2.3 summarizes the results of the continuous emission monitoring system (CEMS) for CO_2, O_2, CO, THC, NO_x, and SO_2 on an hourly basis. These results for the CEMS are then provided in graphical form in Figures 2.1 and 2.2. Particulate and CEMS field data are located in Appendices B and C, respectively. Laboratory and process data are provided in Appendices D and E, respectively. Example calculations are illustrated in Appendix G.

TABLE 2.2. LIME KILN
SUMMARY OF PARTICULATE EMISSIONS

	RUN 1	RUN 2	RUN 3	MEAN
Date	12-12-89	12-12-89	12-12-89	---
Time Began	0930	1230	1510	---
Time Ended	1030	1330	1610	---
Stack Gas				
Temperature, °F	160	162	161	161
Velocity, ft/sec	26.5	25.2	26.9	26.2
Moisture, %	37.3	34.7	36.2	36.0
Oxygen, %	6.5	7.0	6.5	6.7
Carbon Dioxide, %	16.5	16.0	16.5	16.3
Volumetric Flow Rate $x10^4$ ft^3/min				
At Stack Conditions	5.08	4.82	5.16	5.02
At Standard Conditions	2.71	2.66	2.79	2.72
Particulate				
Isokinetic Sampling Rate, %	95	97	95	96
Concentration[a], gr/ft^3	0.099	0.103	0.097	0.100
Emission Rate, lb/hr	22.8	23.6	23.1	23.2

[a] At standard conditions 68°F and 29.92 inches of mercury.

2.6. LIME KILN

Table 2.6 summarizes the results of the particulate emission testing performed on 19 March 1991 on the Lime Kiln. Field and laboratory data are provided in Appendices G and K, respectively. Sample calculations are presented in Appendix N.

TABLE 2.6. EMISSION DATA - LIME KILN

	RUN 1	RUN 2	RUN 3	MEAN
Date	03/19/91	03/19/91	03/19/91	---
Time Began	1005	1138	1310	---
Time Ended	1108	1240	1412	---
Stack Gas				
Temperature, °F	166	167	167	167
Velocity, ft/sec	24.0	26.1	24.6	24.9
Moisture, %	36.6	36.9	37.8	37.1
CO_2 Concentration, %	16.5	16.5	16.0	16.3
O_2 Concentration, %	11.0	9.0	9.3	9.8
Volumetric Flow Rate				
At Stack Conditions, x 10^4 ft^3/min	4.77	5.19	4.89	4.95
At Standard Conditions[a], x 10^4 ft^3/min	2.56	2.77	2.57	2.63
Particulate				
Isokinetic Sampling Rate, %	95	91	96	94
Concentration, gr/ft^3 @ Standard Cond.[a]	0.058	0.070	0.069	0.065
Emission Rate, lb/hr	12.6	16.5	15.2	14.8
Permit Limit, lb/hr	---	---	---	26.1

[a] 68°F, 29.92 in. Hg.

2.5. LIME KILN

Table 2.5 summarizes the results of the particulate emission testing performed on 27 March 1992 on the Lime Kiln. Field and laboratory data are provided in Appendices F and G, respectively. Sample calculations are presented in Appendix H.

TABLE 2.5. EMISSION DATA - LIME KILN

	RUN 1	RUN 2	RUN 3	MEAN
Date	03/27/92	03/27/92	03/27/92	----
Time Began	1002	1138	1302	----
Time Ended	1102	1238	1402	----
Stack Gas				
Temperature, °F	165	165	165	165
Velocity, ft/sec	25.1	26.3	25.9	25.8
Moisture, %	36.2	36.2	35.7	36.0
CO_2 Concentration, %	16.0	18.0	18.0	17.3
O_2 Concentration, %	8.0	8.0	8.0	8.0
Volumetric Flow Rate				
@ Stack Conditions, x 10^4 ft^3/min	5.00	5.24	5.16	5.14
@ Standard Conditions[a], x 10^4 ft^3/min	2.71	2.84	2.82	2.79
Particulate				
Isokinetic Sampling Rate, %	98	96	95	96
Concentration, gr/ft^3 @ Standard Cond.[a]	0.029	0.032	0.030	0.030
Emission Rate, lb/hr	6.7	7.7	7.2	7.2
Permit Limit, lb/hr	----	----	----	26.1

[a] 68°F, 29.92 in. Hg.

TABLE 2.8

ONE-HOUR SUMMARY OF O_2, CO, NO_x, SO_2, AND THC EMISSION

	TIME PERIOD												
	1	2	3	4	5	6	7	8	9	10	11	12	13
Date[a]	2/23	2/23	2/23	2/23	2/23	2/23	2/23	2/23	2/23	2/24	2/24	2/24	2/24
Time Began	1403	1500	1600	1700	1906	2000	2100	2200	2300	0000	0100	0200	0300
Time Ended	1459	1559	1659	1752	1959	2059	2159	2259	2359	0059	0159	0259	0359
Volumetric Flow Rate $x10^5$ ft^3/min at Standard Conditions	1.36	1.36	1.37	1.37	1.37	1.38	1.38	1.38	1.38	1.43	1.43	1.43	1.43
Carbon Dioxide Concentration, %	16.3	16.7	16.6	16.2	13.4	14.6	15.9	15.8	15.6	15.2	14.6	15.0	15.2
Oxygen Concentration, %	4.5	4.8	5.0	5.2	7.2	6.4	5.2	5.4	5.5	5.6	6.2	5.8	5.6
Carbon Monoxide													
Concentration, ppm	323	940	281	302	69	6	31	36	50	24	16	71	295
Emission Rate, lb/hr	191.7	557.9	168.0	180.6	41.3	3.6	18.7	21.7	30.1	15.0	10.0	44.3	184.1
Nitrogen Oxides[b]													
Concentration, ppm	80	75	81	78	79	80	81	79	81	85	80	80	79
Emission Rate, lb/hr	78.0	73.1	79.6	76.6	77.6	79.1	80.1	78.2	80.1	87.1	82.0	82.0	81.0
Sulfur Dioxide													
Concentration, ppm	0	0	0	0	0	3	1	0	3	0	28	28	5
Emission Rate, lb/hr	0.0	0.0	0.0	0.0	0.0	4.1	1.4	0.0	4.1	0.0	40.0	40.0	7.1
Total Hydrocarbons[c]													
Concentration, ppm	4	13	3	2	1	1	1	1	1	0	0	1	3
Emission Rate, lb/hr	3.7	12.1	2.8	1.9	0.9	0.9	0.9	0.9	0.9	0.0	0.0	1.0	2.9

[a] 1989

[b] as NO_2

[c] as Propane

TABLE 2.8

ONE-HOUR SUMMARY OF O_2, CO, NO_x, SO_2, AND THC EMISSION
(Continued)

	TIME PERIOD												
	14	15	16	17	18	19	20	21	22	23	24	25	AVG.
Date[a]	2/24	2/24	2/24	2/24	2/24	2/24	2/24	2/24	2/24	2/24	2/24	2/24	---
Time Began	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	---
Time Ended	0459	0559	0659	0759	0859	0959	1059	1159	1259	1359	1459	1512	---
Volumetric Flow Rate $x10^5$ ft^3/min at Standard Conditions	1.41	1.41	1.41	1.41	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.38
Carbon Dioxide													
Concentration, %	14.9	14.6	15.0	15.5	14.9	14.8	14.6	15.0	15.0	15.2	14.9	15.0	15.2
Oxygen													
Concentration, %	5.8	6.2	5.7	4.9	5.2	5.1	5.0	5.2	5.6	5.1	5.3	5.5	5.5
Carbon Monoxide													
Concentration, ppm	63	88	469	836	467	470	467	206	291	213	342	225	263
Emission Rate, lb/hr	38.8	54.2	288.6	514.4	277.2	279.0	277.2	122.3	172.7	126.4	203.0	133.5	147.1 158.2
Nitrogen Oxides[b]													
Concentration, ppm	78	72	71	73	67	69	68	70	69	73	69	70	75
Emission Rate, lb/hr	78.8	72.8	71.8	73.8	65.3	67.3	66.3	68.2	67.3	71.2	67.3	68.2	74.9
Sulfur Dioxide													
Concentration, ppm	13	56	22	19	40	35	40	39	27	28	62	55	20
Emission Rate, lb/hr	18.3	78.8	31.0	26.7	54.3	47.5	54.3	52.9	36.7	38.0	84.2	74.7	31.9 27.8
Total Hydrocarbons[c]													
Concentration, ppm	1	1	7	10	5	6	6	2	4	2	4	3	3
Emission Rate, lb/hr	1.0	1.0	6.8	9.7	4.7	5.6	5.6	1.9	3.7	1.9	3.7	2.8	3.1

[a] 1989

[b] as NO_2

[c] as Propane

TABLE 2.6

Not Reviewed, [illegible]

PARTICULATE EMISSION DATA - PRECIPITATOR INLET AND OUTLET AT CONDITION 2

	RUN 7		RUN 8		RUN 9		RUN 10		RUN 11		RUN 12		MEAN	
	INLET	OUTLET	INLET	OUTLET	INLET	OUTLET	INLET	OUTLET	INLET	OUTLET	INLET	OUTLET	INLET	OUTLET
Date	2/23/89	2/23/89	2/23/89	2/23/89	2/23/89	2/23/89	2/24/89	2/24/89	2/24/89	2/24/89	2/24/89	2/24/89	---	---
Time Began	1413	1330	1738	1730	2140	2130	0130	0130	0535	0530	0930	0930		
Time Ended	1540	1430	1852	1830	2300	2230	0255	0230	0655	0630	1025	1030		
Stack Gas														
Temperature, °F	487	461	490	462	484	457	484	458	488	459	491	468	487	461
Velocity, ft/sec	57.9	83.9	56.7	82.9	56.1	84.0	57.0	84.2	57.5	85.2	58.4	83.1	57.3	83.9
Moisture, %	34.4	25.4	26.4	24.4	25.5	24.9	24.4	27.5	24.6	27.3	26.0	27.3	26.9	26.1
Oxygen, %	7.0	7.0	7.0	7.5	6.0	5.6	6.4	6.4	6.0	6.0	7.0	6.0	6.6	6.4
Carbon Dioxide, %	12.0	13.0	12.0	12.9	13.2	14.0	13.0	13.0	13.0	13.0	12.0	13.0	12.5	13.2
Volumetric Flow Rate $x10^5$ ft^3/min														
At Stack Conditions	3.26	3.14	3.19	3.10	3.16	3.15	3.21	3.15	3.24	3.19	3.29	3.11	3.23	3.14
At Standard Conditions	1.19	1.36	1.31	1.37	1.32	1.38	1.36	1.43	1.37	1.41	1.36	1.36	1.32	1.39
Particulate														
Isokinetic Sampling Rate, %	115	101	104	102	99	97	99	95	100	100	101	97	103	99
Concentration @ STP, gr/ft^3	6.812	0.058	6.730	0.066	5.363	0.053	5.877	0.049	5.375	0.045	6.589	0.049	6.124	0.053
Emission Rate, lb/hr	6928	67.9	7147	77.7	6068	63.0	6857	59.4	6291	55.1	7657	57.2	6825	63.4
Removal Efficiency, %	---	99.0	---	98.9	---	99.0	---	99.1	---	99.1	---	99.3	---	99.1

2.7. NO. 2 RECOVERY FURNACE

Table 2.7 summarizes the results of the particulate emission testing performed on 20 March 1991 on the No. 2 Recovery Furnace. Field and laboratory data are provided in Appendices H and K, respectively. Sample calculations are presented in Appendix N.

TABLE 2.7. EMISSION DATA - NO. 2 RECOVERY FURNACE

	RUN 1	RUN 2	RUN 3	MEAN
Date	03/20/91	03/20/91	03/20/91	---
Time Began	0934	1120	1258	---
Time Ended	1039	1223	1401	---
Stack Gas				
Temperature, °F	421	427	425	424
Velocity, ft/sec	78.9	81.0	78.9	79.6
Moisture, %	26.9	28.8	27.8	27.8
CO_2 Concentration, %	12.5	12.5	13.0	12.7
O_2 Concentration, %	8.5	8.0	7.5	8.0
Volumetric Flow Rate				
At Stack Conditions, x 10^5 ft^3/min	2.98	3.06	2.98	3.01
At Standard Conditions[a], x 10^5 ft^3/min	1.31	1.31	1.29	1.30
Production Rate, lbBLS[b]/hr	96,120	96,120	96,120	96,120
Particulate				
Isokinetic Sampling Rate, %	98	100	97	99
Concentration, gr/ft^3 @ Standard Cond.[a]	0.058	0.056	0.057	0.057
Emission Rate,				
lb/hr	65.8	63.2	62.8	63.9
lb/3000 lbBLS[b]	2.1	2.0	2.0	2.0
Permit Limit, lb/3000 lbBLS[b]	---	---	---	3

[a] 68°F, 29.92 in. Hg.

[b] Pounds black liquor solids.

2.3. NO. 2 RECOVERY FURNACE

Table 2.3 summarizes the results of the particulate emission testing performed on 26 March 1992 on the No. 2 Recovery Furnace. Field and laboratory data are provided in Appendices D and G, respectively. Sample calculations are presented in Appendix H.

TABLE 2.3. EMISSION DATA - NO. 2 RECOVERY FURNACE

	RUN 1	RUN 2	RUN 3	MEAN
Date	03/26/92	03/26/92	03/26/92	----
Time Began	1235	1444	1616	----
Time Ended	1410	1600	1721	----
Stack Gas				
Temperature, °F	441	453	451	448
Velocity, ft/sec	81.0	83.1	83.6	82.6
Moisture, %	27.2	26.5	28.7	27.5
CO_2 Concentration, %	16.0	14.5	15.0	15.2
O_2 Concentration, %	8.5	7.0	9.0	8.2
Volumetric Flow Rate				
@ Stack Conditions, x 10^5 ft^3/min	3.06	3.14	3.16	3.12
@ Standard Conditions[a], x 10^5 ft^3/min	1.31	1.34	1.31	1.32
Production Rate, lb BLS[b]/hr	97,187	96,445	96,445	96,692
Particulate				
Isokinetic Sampling Rate, %	94	97	99	97
Concentration, gr/ft^3 @ Standard Cond.[a]	0.058	0.054	0.048	0.053
Emission Rate, lb/hr	65.2	61.4	54.3	60.3
lb/3000 lb BLS[b]	2.0	1.9	1.7	1.9
Permit Limit, lb/3000 lb BLS[b]	----	----	----	3

[a] 68°F, 29.92 in. Hg.

[b] Black liquor solids.

Printing and Writing Papers
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Cantonment, Florida 32533-0087
904 968-2121

Champion
Champion International Corporation

28 September 1992

RECEIVED
OCT 1 1992
Division of Air
Resources Management

Mr. Clair Fancy
State of Florida
Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Dear Mr. Fancy:

We appreciate the time spent by you and your staff at our 10 September 1992 meeting to discuss CHAMPION's proposed mill modifications to the Pensacola facility. As we noted during our meeting, this letter is intended to document our understanding of the issues discussed relative to the air permitting requirements which will be associated with the mill modification. The issues we discussed can be loosely categorized into three areas:

- Engineering aspects of the permit process
- Air quality modeling issues
- Schedule for submission of information and agency reviews

Our understanding of the issues discussed and agreed upon for each of these areas is summarized below.

Engineering Aspects of the Permit Process

- Based on our preliminary analysis of emissions associated with the proposed mill modification, only two pollutants, CO and NO_x will result in a significant emissions increase, as defined by the PSD regulations. Florida DER indicated that only these pollutants would be required to undergo a BACT review if the preliminary analysis is correct.
- The modified sources which must undergo a BACT analysis include the two recovery boilers, the lime mud dryer, and the new No. 6 boiler.
- The method used to develop the preliminary baseline emissions for the existing mill sources involved using actual stack test data, actual production data, and actual hours of operation for the period, 1 July 1990 through 30 June 1992. In addition, AP-42 emission factors were used to determine TSP/PM-10 emissions associated with the No. 1 and No. 2 gas-fired boilers since no stack test data were available for these sources. SO_2 emissions from these boilers will be determined based upon fuel usage and sulfur content. CHAMPION understands that this approach is acceptable to Florida DER.

- The test data for SO_2, NO_x, CO, and VOCs from the recovery boilers included 25 one-hour test runs. The data was highly variable for these sources; hence, a statistical approach to calculating annual baseline emissions for these sources was used. CHAMPION understands that the approach , which included the use of the upper 95% confidence interval value of the test results to calculate an emission factor for these sources, is considered acceptable by Florida DER.

- CHAMPION understands that there are no new permit application forms and that forms used in the No. 5 boiler application should also be used for this application.

Air Quality Modeling Issues

- The general approach to modeling the mill and other PSD increment and major sources used in CHAMPION's No. 5 Boiler Permit application is still applicable and acceptable.

- Two EPA-approved models will be used in the analysis:

    - SCREEN
    - ISCLT

  The most recent EPA version of each model will be used.

- The SCREEN model will be used to determine the "worst-case" load conditions associated with the new boiler as well as the other source modifications. It will also be used to evaluate one-hour and eight-hour CO impacts associated with these sources.

- The ISCLT model will be used to evaluate the annual NO_x increment consumption and compliance with the NO_x NAAQS.

- The most recent available meteorologic data set for Pensacola, Florida (1986-1990) will be used. These data will be supplied to Florida DER on a computer disc.

- The receptor grid used in the previous No. 5 boiler application is acceptable for use in the current application.

- The major sources and PSD increment sources used in the No. 5 boiler application will form the basis for the modeling study. The Florida DER meteorologist, Cleve Holaday, will identify any new NO_x PSD increment consuming sources or major sources which must be included in the modeling analysis. CHAMPION will contact Alabama to determine if any new sources in Alabama must be included in the modeling analysis.

- Only pollutants which will result in a significant emissions increase, as defined in the PSD regulations, must undergo an air quality modeling study. Preliminary emissions data suggest that only NO_x and CO will have significant emissions increases.

- A building wake effects analysis, similar to that used in the No. 5 boiler application, will be conducted for all sources at the mill including the new No. 6 boiler. It is understood that WESTON's down-wash program, previously used in the No. 5 boiler application, which will be used in this application, is acceptable to Florida DER. The results of the analysis will be included with the application.

- The Florida DER meteorologist, Cleve Holaday, will review background NO_x data for the Pensacola area and will advise CHAMPION of the appropriate background NO_x concentration to be used in the NAAQS demonstration.

- A modeling analysis of impacts on Class I areas is not anticipated to be required since the areas are more than 150 km from the mill. Florida DER will advise CHAMPION of any requirements if modeling is required.

- Impacts on soils, vegetation, visibility, and acid rainfall will be similar to the analysis used in the No. 5 boiler application. This is acceptable to Florida DER.

- An air toxics analysis need only be conducted on emissions from new or modified sources. Pollutants to be evaluated include any known or published emissions of the 189 chemicals included on the CAA list of air toxics. Testing of these sources for these compounds is not required.

- A hard copy of the model input and output as well as a disc containing this information will be provided to Florida DER with the application.

- A formal modeling protocol is not required since the proposed analysis will be similar to the previous No. 5 boiler application.

Schedule for Submission of Information and Agency Review

- CHAMPION understands that the agency will accept information, as developed, to begin their review of the proposed modification prior to the submission of a complete application.

- CHAMPION will submit a description of the proposed project and the baseline emissions inventory the week of 28 September 1992. This will provide an opportunity for the DER engineers assigned to review the modification to become familiar with the project and to evaluate the methods used to establish the baseline emissions prior to the formal submission.

- CHAMPION plans to submit the complete permit application by the second week in November. Florida DER has agreed to review the application and advise CHAMPION of any deficiencies by phone to ensure that all information is received in a timely fashion.
- Florida DER indicated that a complete application could potentially be reviewed and a permit could be issued by March of 1993.

We believe this summarizes the issues addressed at our meeting. Please advise us via letter of your concurrence with these issues, or provide us with any difference between our understanding and yours. We appreciate your assistance on this important project.

Sincerely,

David Arceneaux
Permitting Coordinator

DTA:sa

cc: John Barone, Roy F. Weston, Inc.

Champion
Champion International Corporation

DATE 10/22 TIME 1:40 ET NO OF PAGES 4

TO: [redacted] FROM: Steve Webb 904 968 2121 x 2498

LOCATION: LOCATION:

COMMENTS: Follow up letter from Champion and FDER meeting of September 10, 1992 - Bru ?

049683068 OCT 22'92 13:36 No.008 P.01

DATE 10/22 TIME 1:40 ET NO OF PAGES 4

FROM Steve Webb 904 968 2121 x 2498

LOCATION:

- from Champion and FDER meeting
er 10, 1992 - Bru ?

Patty - 10-26-92
~~Buxton~~, Bruce
FYI or discuss
I don't know who has this or attended the meeting. Until I saw calculations and reviewed them, I would not have committed to this!!!
Bru

~~Patty~~ has this
Who
Willie Tims
Janet Price

He says that he has sent about 1" of paper plus the original to CHF.
Preston
10/22/92

Champion
Champion International Corporation

28 September 1992

Mr. Clair Fancy
State of Florida
Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Dear Mr. Fancy:

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- Engineering aspects of the permit process
- Air quality modeling issues
- Schedule for submission of information and agency reviews

Our understanding of the issues discussed and agreed upon for each of these areas is summarized below.

Engineering Aspects of the Permit Process

3.121(13), F.A.C.), ammonia (§17-3.121(3),F.A.C.) and biological integrity (§17-3.121(7), F.A.C.).

7. Under Section 17-4.240(4), F.A.C., DER is prohibited from issuing a permit for a discharge renewal permit if the proposed discharge will reduce the quality of the receiving waters below the classification established for them. The DER was therefore without authority to grant the instant permit.

8. The discharge is not only polluting Eleven-Mile Creek but is travelling into Perdido Bay and backflowing up the Perdido River, an Outstanding Florida Water. The discharge is lowering ambient water quality and is not in the public interest, contrary to Section 17-4.242, Florida Administrative Code.

9. The pollution from the pulp plant is interfering with the biological health of Eleven-Mile Creek, Perdido Bay and the Perdido River by adversely impacting aquatic life, disrupting photosynthetic processes in the water column which damages aquatic vegetation, and causing the discoloration and fouling of the water generally. The pollution settles over the water bottoms and smothers benthic vegetation and organisms.

10. Respondent Champion International, Inc. is not entitled to the permit in that it, in effect, seeks a variance of previous restrictions placed upon Champion International by FDER.

a) Under §403.201(1)(b), F.S. Champion would only be entitled to a variance if the technologies available are unreasonably expensive and must be spread over a considerable time. In order to qualify for a variance under §403.201(1)(b), the Respondent/Corporation would have to adhere to a specific timetable for compliance. Champion cannot qualify for this variance because the company, in relation to its size and corporate assets, can afford to make the pollution reductions immediately. Even if the reductions had to be spread out over a period of time, the variance permit would have to fail because DER failed to follow its own rules by failing to put the corporation on a specific timetable for a specific technology. The variance permit contains only the vaguest language about future compliance and has no mandatory conditions requiring the corporation to reach compliance by a specific method or by a date certain. For this reason, it must fail.

b) Under Section 403.20(1)(c), Florida statutes, the second possible statutory scheme under which to gain a variance, Champion would have to show that compliance would be a substantial hardship upon it. Champion has failed to show that it would. Further, the corporation is not entitled to a variance under this provision because such variances are only allowed for a maximum period of 24 months. Champion's variance is not so limited. Furthermore, the corporation is already operating under a variance and would not be entitled to any extensions.

c) Furthermore, by incorporating in its application for permit, Champion International is essentially creating a domino effect to earlier restrictions and regulations placed upon it and by granting the proposed permit, the Department of Environmental Regulations will effectively be waiving prior restrictions due to the fact that the practical effect of the modifications to the plant will be to alter the operation of other operations of the plant and in effect, by-pass and shortcut other regulations imposed by FDER on said plant which were imposed for the protection of Perdido Bay, its estuaries and the citizens living and earning a living in and on and under its estuaries, bays and other waters. Unstated in the permit is an obvious intent to increase production which will thereby be allowed although not specifically applied for. The proposed permit is simply a sidestep to important regulatory functions of the Florida Department of Environmental Regulations and shows a callous disregard for the Environment of Escambia County, Florida and Baldwin County, Alabama including its air, water, lands and living organisms.

11. The variance should not be granted because it will continue a pattern of degradation of the creek and bay system that has endured for many years. The corporation has been violating state standards for years under a variety of variances. Instead of the discharge pollutants decreasing, they are increasing. Champion is hereby requesting a variance to discharge amounts of pollutants that are higher than those allowed under its old variance. The plant operations are greatly expanding output from 280 tons of pulp per day to 1400 tons of pulp per day. It is this five-fold increase in bleached pulp capacity that requires the increased pollutant limits under the variance request. Champion is not obligated to increase its pulp production. It should clean up what it has first before it is allowed to expand.

12. The data upon which the variance was based is faulty.

13. The variance application was incomplete and DER should have denied the variance on that basis alone.

14. Under DER's rules, the agency should be seeking compliance through enforcement instead of granting a variance to subvert state water quality standards.

15. Champion's plant does not have adequate capacity to prevent spills and leaks nor to contain its contaminated run-off in the event of hurricanes or other meteorological disasters.

WHEREFORE, Petitioner requests the following relief:

A. That the operating permit be denied.

B. That the variance be denied.

C. That, in the alternative, Champion be required to address the fact that it will be violating or side-stepping rules and regulations applying to it and otherwise admit that it will violate as well as the unadmitted parameters that it will violate and that the corporation be required to make specific technical changes in its plant so as to bring itself into compliance with Florida law by a date certain, but in no event more than six (6) months, and that the agency condition any temporary operating permit issued during the technical "change-over" period so that if the plant fails to accomplish the change-over within the required time frame, it will be shut down until the changes are made. Further, if the changes are made and the plant still does not come into compliance with state law, that the plant be shut down until such time as it can affirmatively show that it can bring itself into compliance.

RESPECTFULLY SUBMITTED,

THOMAS O. BEAR
ATTORNEY FOR PETITIONERS

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RECEIVED

MAR 28 1993

Dept. of Environmental Reg.
Office of General Counsel

Jacqueline M. Lane
10738 Lillian Highway
Pensacola, Fl. 32506
904-453-5488
Escambia County, Florida

vs.

Florida Department of Environmental Regulation
Office of General Counsel
2600 Blair Stone Road
Tallahassee, Fl. 32399-2400

REQUEST FOR HEARING CHALLENGING THE LEGALITY OF THE INTENDED CONSTRUCTION PERMIT ISSUED TO CHAMPION INTERNATIONAL CORPORATION

COMES NOW Jacqueline M. Lane and hereby requests a formal hearing pursuant to Section 120.57 F.S. to determine that the construction permit (DER File Nos. AC 17-223343, PSD-FL-200, Escambia County) issued to Champion International Corporation is inconsistent with the department's rules for permitting and hence is illegal, and in support thereof would allege as follows:

1. The Petitioner's address for the purpose of this action is: 10738 Lillian Highway; Pensacola, Fl. 32506; Escambia County, Fl.

2. The permit applicant is Champion International; 375 Muscogee Road; Cantonment, Fl 32533.

3. The Department of Environmental Regulation is located at 2600 Blair Stone Road; Tallahassee, Florida 32399-2400.

4. The Petitioner is a substantially affected person, as follows:

a. She owns property on Perdido Bay and she and her family use Perdido Bay for recreational purposes.

b. She lives approximately 15 miles South of Champion and can see and smell the air emissions from the mill.

c. Champion discharges effluent into Eleven Mile Creek and then into Perdido Bay. The effluent from the mill has been degrading the water quality and causing a nuisance along the property owned by the Petitioner.

5. A Consent Order was issued to Champion in 1988, whereby Champion was required to submit engineering plans to the Department of Environmental Regulation (hereafter "The Department") within 6 months after approval of the study report addressing water quality violations. To accomplish the

corrective actions, the Consent Order allows Champion to apply for necessary permits (Section 14E).

6. On March 13, 1993, the Petitioner read in the legal notices in the Pensacola News Journal that The Department intended to issue Champion International a "permit". Upon going to the Department's Northwest District Office and obtaining a copy of the permit, she discovered "the permit" was for construction of changes to the mill's processes in order to improve the mill's effluent, as required in the Consent Order. However the "permit" was issued through the air department, and not through the industrial wastewater section.

REASONS WHICH MAKE THIS CONSTRUCTION PERMIT ILLEGAL

7. As required in 17-4.030 F.A.C., a permit is required to expand or modify a facility. This modification will change not only the air emissions of the mill, but also the effluent emissions. The changes which are being made, are supposed to improve the wastewater and improve surface water quality. The construction permit application should have been made to the wastewater section, and perhaps another permit application to the air section. As required in 17-4.210 (5), design criteria must be presented with the application of a construction permit. This permit, for which the intent was issued on March 13, 1993, contained NO design criteria for the improvements to the wastewater system, **and hence is incomplete**.

8. The proposed project was subject to Prevention of Significant Deterioration regulations, which meant that under section 17-210.350 (2)a, 1-3. F.A.C., additional public notice requirements were required. This rule is/was being violated, in that a 30-day comment period is required, and a complete file must be made available to the public. The intent to issue only gives the public a 15-day period of comment **and** the Department does not have in its district office a complete copy of the modeling program which was required to evaluate the impact of the significant increase in certain air emissions.

9. Champion has been violating certain requirements of the Florida Administrative Codes, specifically 17-296.320(2) in its release of obnoxious odors, and 17-210.650 and 17-210.700(4) by operating the plant in an irresponsible manner so as to release excessive air emissions and cause harm to public health.

REQUEST FOR RELIEF

WHEREFORE the Petitioner requests:

1) that the Department require an additional construction permit for wastewater treatment improvements, including the effluent characteristics which the improvements are expected to achieve, and reasonable assurance that the effluent characteristics will not violate state water quality regulations

given in 17-302 F.A.C. and F.S. 304; or that the Department include the above information with the air permit.

2) that the Department reissue the Statement of Intent allowing 30-days for public comment and review, and that the Department make available to the public at the District Office in Pensacola, all information concerning how a determination was made, including the air dispersion model, as required by 17-210.350 (2) F.A.C.

3) that the Department investigate fully, citizen complaints about human health problems around the mill, including an epidemiological study of child allergies and cancers.

4) that the Department place more stringent standards on the Total Reduced Sulfur emissions so that the obnoxious odors are less obnoxious.

Respectfully submitted,

Jacqueline M Lane

Jacqueline M. Lane
10738 Lillian Highway
Pensacola, Florida 32506
904-453-5488

CERTIFICATE OF SERVICE

I hereby certify that a true copy of the above has been sent by Federal Express to The Office of General Counsel at The Department of Environmental Regulation and to Mr. Doug Owenby at Champion International, at the addresses specified above, on this 22 day of March, 1993

Jacqueline M Lane

Jacqueline M. Lane

Copies Sent to:

J. Alan Cox
Suite F-100
820 east Park Avenue
Tallahassee, Fl. 32301-2500