



STATE OF MAINE

Department of Environmental Protection

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Lincoln Pulp and Paper Company)
Kraft Pulp Mill)
Lincoln, Maine)

FINDING OF FACT & ORDER
Air Emission License Renewal
New License for No. 6 Boiler

After review of the available air quality data for the Town of Lincoln, the Department Air Emission License File for Lincoln Pulp and Paper Company, enforcement files involving Lincoln Pulp and Paper Company including Consent Agreements and Consent Decrees and an air emission license application submitted by Lincoln Pulp and Paper Company for renewal of their license and the supporting information from the J. E. Serrine Company, Lincoln's consultant, the Board finds the following facts.

1. EXISTING LICENSE AND ACTION SUBSEQUENT TO ITS ISSUANCE.

The Board issued Air Emission License #1703 to Lincoln Pulp and Paper Company (LPP) on January 2, 1980, which was issued as a one year license to permit review of environmental improvement actions the Board thought necessary to require on that license. Those actions, by conditions on the license required LPP to correct emission standard violations caused by the Kraft Recovery Boiler, monitor TRS emissions and correct nuisance emissions from the sawdust storage area. License #1703 includes the following equipment:

1. No. 3 Boiler 68.0×10^6 BTU/Hr.
2. No. 4 Boiler 247.5×10^6 BTU/Hr.
3. No. 5 Boiler 128.0×10^6 BTU/Hr.
4. No. 7 Boiler 92.2×10^6 BTU/Hr.
5. No. 8/9 Boiler 66.0×10^6 BTU/Hr.
6. No. 1 converted recovery boiler 114×10^6 BTU/Hr.
7. Kraft Recovery Boiler 242×10^6 BTU/Hr
(No. 6 Oil) 355 ADT/day
8. Pulp digester old 12.5 ADT/Hr.
9. Pulp digester new 8.33 ADT/Hr.
10. Smelt tank 355 ADT/Day
11. Lime Kiln 375 ADT/Day
12. Evaporator
13. Salt Cake Unloading Pneumatic System

Failure to comply with terms of this license and other rules caused the Department to initiate a consolidated enforcement action against LPP. This action was finally completed on January 14, 1981 in the form of a Consent Agreement between this Board, the Attorney General and LPP. The Agreement resolved that LPP would commence steps to comply with all regulations. Penalties were to be settled by separate litigation.

Meanwhile, the Department initiated proceedings to designate the Town of Lincoln a Nonattainment Area for total suspended particulates. This action was completed on January 14, 1981 when the Board adopted the necessary regulatory revisions. Subsequently, sulfur dioxide violations were monitored, but the Board has not moved to address these because it believed actions taken by LPP may have solved them.

During the early winter of 1981 LPP wished to decommission Boilers 4, 5 and 8/9 and install a new to LPP, yet used, boiler to be designated No. 6 Boiler. Despite overall reductions in both sulfur dioxide and total suspended particulate emissions achieved by fuel conservation and additional reductions expected due to greater efficiencies of the newer boiler, and that LPP agreed to install RACT type control (oxygen and viscosity controls) and that the new boiler duct work would be routed to the taller brick stack to help solve the suspected downwash causing SO₂ violations - it was impossible to find standards would be maintained in Lincoln. Thus the Board could not issue a license renewal nor an amendment to the existing license for this boiler change. Instead, the Board acknowledged that the existing expired license remained in effect in accordance with the APA until the Board took action to renew or terminate it. The Board being represented by the Attorney General then entered into a Consent Decree with LPP and Natural Resources Council of Maine (an interested party given standing by the Superior Court in which the Decree was filed). This Decree allowed LPP to install and operate new No. 6 Boiler provided it:

- a. Dismantle existing No. 5 Boiler and not operate existing No. 4 Boiler until the Board finds that no violations of ambient air quality standards will occur;
- b. Install one continuous SO₂ monitor at Lincoln Post Office and at another location selected by the Department;
- c. Submit an air quality analysis by June 1, 1982;
- d. Limit emissions from No. 6 Boiler to not exceed 0.12 lbs.PM/10⁶ BTU;
- e. Install viscosity control on No. 6 Boiler;
- f. Vent No. 6 Boiler to the tall brick stack;
- g. Limit all oil burned in the mill to 2.22 percent sulfur by weight;
- h. Limit total fuel oil consumption excluding the lime kiln to not exceed 65,000 gallons per day except when the Recovery Boiler is being fired at a rate of less 800,000 lbs of black liquor solids per day.

The equipment included in LPP's application and for which this license is issued includes:

1. No. 3 Boiler 66.3×10^6 BTU/Hr.
2. No. 4 Boiler 247.5×10^6 BTU/Hr.
3. No. 7 Boiler 100.1×10^6 BTU/Hr.
4. No. 8/9 Boiler 66.0×10^6 BTU/Hr.
5. No. 1 Converted Recovery Boiler 112×10^6 BTU/Hr.
6. Kraft Recovery Boiler 242×10^6 BTU/Hr. (oil) 444 ADT/day.
7. Pulp digester - old - 12.5 ADT/Hr.
8. Pulp digester new - 8.33 ADT/Hr.
9. Smelt tank 444. ADT/day
10. Lime Kiln and Lime handling equipment 444 ADT/day
11. Salt cake unloading pneumatic system
12. Evaporators - 444 ADT/day
13. No. 6 Boiler 127×10^6 BTU/Hr.

2. THE STUDY APPROACH

This Decree was amended several times to allow for contingencies in completing the study. Several other requirements were added during these amendments. LPP and Sirrine with the staff proceeded to complete a study of the air quality violations in the Town of Lincoln with a view to providing a strategy to achieve the ambient air quality standards. On this strategy depends the issuance of an air emission license to LPP. The study group proceeded by first defining all emissions that might affect air quality in the vicinity of LPP. These emissions were quantified to the extent possible, controlled to a level determined to be Best Practical Treatment and then modeled. The concentrations predicted by modeling were added to background concentrations which included air quality impacts from all other sources in the area. Various additional emission reducing controls were added until the sum of modeled plus background concentrations met standards.

3. IMPORTANT CAVEATS NEED TO BE ATTACHED TO THIS STUDY.

They will be described in more detail in the appropriate sections below. Briefly they are:

- a. Two important and four not so important emissions could not be quantified and/or accurately modelled. They are to be controlled by various means and for the purposes of this study were assumed to be zero. Though they may have some impacts those impacts are not included in this analysis. The Board in this particular case feels that further efforts to quantify them is not warranted due to the inability to do so and the inability to determine accurately their impacts. The Board is requiring in conditions g and j a monitoring program including a monitor

for fine particulates that have greater health impacts. Actual air quality data collected by these monitors will include these sources in the compliance verification. These sources are further controlled by conditions z, aa, bb and cc. Should these sources contribute to a violation the Board, by condition ee, can reopen the license to require additional actions to meet the standards.

b. Background is a very difficult measurement to quantify. The impacts from the mill are inextricably tied to impacts of the emissions from the rest of the town. A complicating factor is that background must be estimated for a condition that has not been monitored, that is background is being estimated on the basis that the Town of Lincoln in the future purchase and operate a vacuum street sweeper. There is a difference between the background analysis produced by the staff using the conservative procedures the Board expects and the analysis submitted by Sirrine which may also be conservative but less so. However, the Board notes that this difference is limited to 18 ug/m on the 24 hour TSP background levels and that the staff agrees with all other background concentrations selected. The 24-hour particulate levels are the most variable and subject to the most uncertainty. The Board notes that additional control measures are available at LPP should the monitoring plan, ordered herein, indicate that sufficient emission reductions at the mill have not been realized to meet the standard. Control of mill emissions that will tend to minimize this difference are required by conditions k, m, q, x, y, z, aa, bb, cc and dd. The monitoring program required by condition j should also help to determine the effectiveness of the measures that Sirrine used to obtain a lower background level.

c. A violation of the sulfur dioxide standards is predicted on a small area of elevated land near the mill - Fish Hill. The model used tends to predict high, though not always. Usually a more refined model is used to predict more accurately the impacts should the first model indicate violations. However the meteorological data available is not of sufficient quality to use the more refined models in this case. LPP has chosen to monitor on Fish Hill to determine if sulfur dioxide violations are occurring. The Board also notes that LPP plans to install new meteorological monitoring facilities along with the new ambient monitoring program. This should enable more refined modelling at a future date. Further analysis and verification of this issue is required by conditions h, i and j. Should violations be verified the Board, by condition ee, can reopen this license to require additional actions to achieve the standards.

4. GOOD ENGINEERING PRACTICE STACK HEIGHT

All stack heights are regarded to be less than GEP height, therefore downwash conditions were included in all modeling.

5. EMISSION SOURCES AND BEST PRACTICAL TREATMENT

The emission sources on the license issued by this order and the emission controls determined to be Best Practical Treatment (BPT) for those sources are as follows.

a. Recovery Boiler - Under the previous license, and until recently, this source had difficulty meeting the emission and opacity standards. The Boiler has had a history of emission standard violations including difficulties meeting the manufacturers performance guarantees. LPP has provided better black liquor flow and inventory control which has decreased the periods when oil was burned. The electrostatic precipitators which are the control devices for this source are turned off when oil is fired. LPP installed during July 1982 a wet bottom onto the existing ESP which has improved emission levels generally. The Board notes this boiler is equipped with high grade opacity monitors. The wet bottom ESP and the elimination of shifts from black liquor to oil should more than meet the particulate emission standard. ESP's represent common practice in the industry. The Board therefore finds this control to be Best Practical Treatment for particulates for this source. The boiler itself is a sulfur recovery device and no additional sulfur controls are required to represent BPT for sulfur dioxide.

b. Lime Kiln. The lime kiln is equipped with a variable throat venturi scrubber. This is the most common type of control used in the industry on this type of source. Lincoln Pulp & Paper has tested the emissions from this lime kiln with the scrubber operating at a pressure drop of twenty inches wc and found them to be 0.65 lbs. particulate/ADT. The emission standard for this source is 1 lb. particulate/ADT. The Board finds this source is receiving Best Practicable Treatment for particulates. Because modeling of this source was done at 0.65 lbs/ADT this emission rate is required and included in this BPT determination. Because of the sulfur dioxide absorbing capacity of lime kiln the Board is not interested in sulfur emissions from this source at this time.

c. Power boilers. Lincoln Pulp & Paper has agreed to dismantle boiler #5 and decommission and not operate boilers # 4 and 8/9 . Boilers # 1,3,7 and 6 are included in the modelling and are included on this license. Boiler # 6 presently has viscosity control and oxygen monitors. Boiler #7 presently has oxygen monitors and Lincoln Pulp & Paper will be adding viscosity control. Boilers # 1 and 3 presently

have neither types of control, however, Lincoln Pulp & Paper will be adding oxygen monitors to these boilers and a viscosity monitor to boiler #3. Viscosity controls will not be needed for boiler #1 since low sulfur oil will be burned. These controls are consistent with the type of control EPA has published in its guidance documents to represent RACT for particulate controls to be applied to existing sources in nonattainment areas. This level of control has been found to achieve the 0.12 lbs. particulate per million BTU placed on #6 boiler. With this equipment all boilers are considered to be receiving Best Practicable Treatment for particulate emissions. All boilers, except #1, will be burning 2.3 percent sulfur oil which meets the sulfur in fuel emission standard and is generally the quality of oil available in Maine and consumed by other paper companies. The Board finds this quality oil alone represents Best Practical Treatment for the sulfur emissions from these sources. Boiler #1 will be required to burn 0.5 percent sulfur fuel due to severe down-washing of its stack causing modeled air quality violations. This sulfur level is deemed Best Practical Treatment for this source. Boiler #6, because its application was received after the Board designated the Town of Lincoln a Nonattainment Area, must be addressed to be determined if it is subject to the LAER requirements. LAER is required for certain new sources in nonattainment areas. Since this boiler greater than 25 but emits less than 100 tons per year of particulates and after examination of modeling data submitted by Serrine it is concluded that the air quality impact from this boiler when functioning with other boilers will itself have an insignificant impact. When operating alone its impacts will be greater than the insignificant levels. Condition u limits operation of number 6 boiler to generally not operate alone, the refore LAER is not required.

d. Lime Slaker Vent. Emissions from this source were suspected to cause air quality particulate violations. Prior to modeling Lincoln Pulp & Paper agreed to install a wet scrubber capable of achieving 90 percent emission reductions by July 10, 1983. Wet scrubbing is regarded as Best Practicable Treatment for this type of source in that the scrubbing liquor can be used in the process.

e. Lime Causticizer Vent. These particulate emissions were expected to cause air quality problems and Lincoln Pulp & Paper intended to route these emissions to the lime slaker vent scrubber, but was unable to give the mill design. A demister scrubber capable of achieving 70 percent emission reduction will be installed by July 10, 1983. Wet scrubbing is regarded as the Best Practicable treatment for this emission because the scrubbing liquor can be used in the process. A low energy scrubber is justified due to the size of the source.

f. Smelt Tank. This source is controlled by a demister scrubber followed by a condenser capable of meeting 0.3 lbs. particulate matter/air dried ton. The emission standard for this source is 0.5 lbs. particulate matter/air dried ton. This technology is similar to that used throughout the industry and is appropriate in that the scrubbing liquor can be used in the process. These controls represent Best Practicable Treatment for this emission source. Because modeling of this source was done at 0.3 lb/ADT this emission rate is required and included in this BPT determination.

g. Tissue Dryer. This is the vent for the heat source that dries the paper. It burns #2 fuel which is the cleanest fuel available to Lincoln Pulp & Paper and use of that fuel alone is considered Best Practicable Treatment for this source.

The following sources have not been modeled but have sufficiently significant particulate emissions that they have been evaluated for the use of Best Practicable Treatment. Reasons for not modeling these sources are as indicated below. However to ensure that standards are maintained, condition ee which allows reopening of this license for additional controls has been added.

a. Starch Slurry Tank Vent. This particulate emission source is the vent from the tank in which starch is dissolved. Lincoln Pulp & Paper proposes to install a wet scrubber on this source capable of 70-90 percent emission reductions. Wet scrubbing is an appropriate type of control because the scrubbing liquor can be used in the process and thus the Board finds this source is receiving Best Practicable Treatment. Being an intermittent source and difficult to quantify and since after control will have insignificant emissions it was not modelled.

b. Lime Silo Vent. This too is an intermittent particulate source that operates during receipt of bulk shipments of lime. It operates approximately 153 days a year and seldom if ever exceeds 4-5 hours per day of operation. Lincoln Pulp & Paper elected to install a fabric filter on this source capable of achieving 99+ percent emission reductions. This is the common method of control for this type of source. The Board determines this source to be receiving Best Practicable Treatment.

c. Salt Cake Silo Vent. This too is an intermittent particulate source that operates during receipt of bulk shipments of salt cake and when salt cake is needed to make up cooking liquor. Operation occurs 60 percent of the time but does not operate every day. This source is already equipped with a fabric filter control capable of achieving 99

percent plus emission reduction which is the common method of control of this source in the industry and deemed to be Best Practicable Treatment. Because salt cake appeared in the ambient air samples, Lincoln Pulp & Paper overhauled its filter. On the consultant's recommendation closer mesh bags have been installed.

d. Mill Roads. A significant quantity of road dust and related materials has been found in the ambient air samples. The mill, as well as the town, has a number of roads that are air pollution sources. (Town road control action is addressed below under Air Quality Analysis.) Defining the emissions from these roads and modeling them would prove difficult and the cost of such an inexact study could well exceed its value. Extrapolating from experiences in Millinocket and Westbrook, paving and mill road and yard clean up can have a significant impact on surrounding air quality. Lincoln Pulp & Paper will take the following actions to reduce emissions from their roads:

- i. Lincoln Pulp & Paper will pave the areas shaded on appendix A to this order;
- ii. Lincoln Pulp & Paper will sweep weekly with a vacuum street sweeper all the paved areas of the mill.(Indicated on appendix A);
- iii. Lincoln Pulp & Paper will chemically stabilize other traffic areas in the mill area as indicated in Appendix A through a private contract. This process is indicated in the Serrine AQA Report.

The Board finds that there is little additional action Lincoln Pulp & Paper could take to reduce impacts from mill roads and finds this source receiving BPT. The Board notes that a good deal of open land is consumed in the solid waste disposal areas. Proper solution to violations at the dump would involve reducing unvegetated areas thus reducing emissions as well.

e. Sawdust handling operations - Lincoln Pulp & Paper uses sawdust in its pulping operation extensively. The sawdust storage pile has been a significant cause of ambient air quality violations in the Town of Lincoln. Two methods of controlling the sawdust pile were examined. The Board received comments regarding these controls from Dr. Judson Barron of MIT. The two means of controlling sawdust are to control exposure to the entire pile by installing windbreaks or to control sawdust during the process of dumping from the unloading conveyer to the pile. It has been determined by observation that the greatest emission occurs during the free-fall from the conveyer to the pile during unloading. The Board previously required boots, or sacks, through which

the sawdust would fall onto the pile. This approach however proved incompatible with the conveyer as the boots became hung-up on the steel framework of the overhead conveyer. After some debate at its September 8, 1982 meeting the Board agreed to accept installation of an air foil system further described in the record, to create a dead space at the top of the pile. Unloading during periods when sawdust is blowing from the conveyer dumping operations will be in the vicinity of these plates. This system is installed and in use as of this order and is found to be Best Practicable Treatment.

The following sources were identified during inspections of Lincoln Pulp & Paper facilities but have not been included in this study because action has been taken to eliminate them or air emissions are so small as to be insignificant.

- a. Reject sawdust pile. This is not an active source. It has settled and no longer seems to be becoming airborne. In addition the Company is committed to eliminate this pile as time permits.
- b. Lime Slaker Screw Conveyer. It was determined that keeping the covers on this conveyer would eliminate any discharge.
- c. M and D Rotary Valve. This emission has been eliminated by valving and piping changes.
- d. Precipitator Hopper Discharge. This source has been eliminated by the wet bottom electrostatic precipitator.
- e. Sawdust Cyclone. This cyclone was replaced as an action on the consent agreement.
- f. Chip Cyclone. Some emissions were found on the chipper cyclones on an initial inspection. Lincoln Pulp & Paper has installed screening over the ends of these cyclones that has eliminated some of this problem.

5. MODELLED IMPACTS OF MILL SOURCES

Modeling of the above listed emissions was completed using ISC as described by Sirrine and in a memo dated November 29, 1982 from Norma Gordon to David Dixon. Including all meteorological conditions and all locations the maximum impacts were:

Ambient Air Quality Standards

3 hour sulfur dioxide	1,057 ug/m ³	1150 ug/m ³
24-hour sulfur dioxide	192 ug/m ³	230 ug/m ³
Annual sulfur dioxide	17 ug/m ³	57 ug/m ³
24-hour TSP	73 ug/m ³	150 ug/m ³
Annual TSP	8 ug/m ³	60 ug/m ³

Modeling was done for the higher terrain as described in the above mentioned memo using a special model (VALLEY) since the ISC model has elevated terrain limitations. VALLEY modeling assumed worst case conditions and predicted the following maximum impacts occurring on Fish Hill:

24-hour sulfur dioxide	269 ug/m ³
Annual sulfur dioxide	32 ug/m ³
24-hour TSP	49 ug/m ³
Annual TSP	7 ug/m ³

Since the 24-hour sulfur dioxide standard is 230 ug/m³, clearly VALLEY predicts a violation of this standard. This violation appears on Fish Hill and is caused mostly by emissions from the brick stack which includes boilers 3,6 and 7. VALLEY is regarded as a screening model. When screening models (which tend to predict high) indicate violations more accurate, refined models are then used. It cannot be assured that more refined models will show no violations. However, the meteorological data is not available to use this approach. This has left Lincoln Pulp & Paper with two alternatives to demonstrate compliance:

- 1) reduce sulfur dioxide emissions to the point where VALLEY no longer predicts violations, or 2) establish a monitoring program that will demonstrate compliance. Lincoln Pulp & Paper has not thought it wise to control based on the VALLEY modeling and has proposed to monitor. Lincoln Pulp & Paper is only using one sulfur dioxide monitor, at Fish Hill base, not near to predicted sulfur dioxide violations due to stated inaccessibility of that area.

The Board in considering the accuracy of any monitoring program instituted to show predicted standard violations are invalid, must follow fairly rigorous procedures to avoid neglecting violations. The Board in this order will be requiring an upgrading of the meteorological monitoring in Lincoln and use of this data in a more refined model for elevated terrain. EPA guidelines often require at least 2 monitors for each contiguous area and several for each averaging time. Required by this order is a second sulfur dioxide monitor on Fish Hill in the vicinity of the maximum impact which will bring this effort closer to the intent of EPA guidelines for such efforts. Monitoring of this kind is usually required before the issuance of a license, however, the Board is imposing a condition to reconsider should ambient violations be monitored.

6 BACKGROUND

The ambient air concentrations resulting from the above modelling were added to a background number to determine total expected air quality concentrations, given all sources in the area. Background concentrations without mill impact must be determined or the effect of Lincoln Pulp & Paper sources will be added twice. Because of insufficient available data and that the Lincoln Pulp & Paper mill is close to and generally upwind of the monitoring sites in town, separating Lincoln Pulp & Paper impacts from those of

all other sources has been difficult. The procedure normally used and the results of applying the procedure to the Lincoln monitoring data are described in a memo dated January 21, 1983 from Jeff Emery to David Tudor. The Board notes that except for 24-hour TSP background this determination produces the same concentrations as those reported by Serrine. There is a 1 ug/m^3 difference in annual TSP concentrations but this is not significant for this analysis.

The Board notes that the 24-hour TSP background concentration determined by staff differs from that determined by Serrine by 18 ug/m^3 due to differences assumed by each for the effect of mill clean up and street sweeping. Serrine stated that the background in the future (at the time of compliance) will be less than that represented by the present measurement by the amount of mill clean up. Serrine subtracted all mill impact reducing the existing monitoring concentrations from 115 ug/m^3 to 106 ug/m^3 . Staff believes that although some reduction of mill impacts for fugitive (spills, etc.) sources will occur, some intermittent sources have not been modeled at all and therefore assuming no future impact would not be realistic. The staff used the second highest presently occurring background concentration (115 ug/m^3) instead of the highest (121 ug/m^3) in an effort to account for such activity. This accounts for the 9 micrograms of difference between Serrine's and staff number (106 vs. 115). The Board finds that neither of these approaches are accurate and that each contain several arbitrary estimates which are necessary to complete the analysis given the present state of data and knowledge. There is no available approach that would guarantee accuracy thus the Board accepts the uncertainty involved in accounting for blowback. It notes that no blowback credit has been given for mill roads although some improvement in the mineral portion of the particulates will occur due to Lincoln Pulp & Paper's mill road clean up program.

The Board notes the conscientious and cooperative spirit of the council and the Town Manager of the Town of Lincoln. Delivery of the vacuum street sweeper is expected in mid-March 1983 - in time for an early spring clean up. A letter dated January 25, 1983 from the Town of Lincoln indicating such is attachment 2 to this order. The Board notes that both staff and Serrine agree that improvement experienced in Bangor's street sweeping program are the only

data available to determine the improvement that will occur in Lincoln. Finding the expected improvement on a daily basis is much more difficult. Surrine analyzed Bangor air quality data from March - October, before and after institution of the sweeping program using a statistical technique (log-Pearson III) and determined that one can be 99 percent confident that the daily values have been reduced by 35.4 percent. The staff noted that Surrine analysis was applied to non winter months (March-October). The staff analysis calculated annual average reductions on a two year period both before and after institution of the Bangor sweeping program and determined a 24 percent reduction in air quality levels was achieved. This difference accounts for the remaining 10 ug/m^3 difference between the future concentrations determined by Surrine and staff. The Board finds that neither analyses is absolutely accurate. The average may be a good estimator of reductions but its use alone ignores improvements caused by reductions in variability in short term concentrations. Neither analysis accounted for mill road improvements that should effect year-round particulate levels. The staff applied an annual average reduction to daily periods throughout the year. Both analyses are limited in that they assume that street sweeping will be as effective in Lincoln as it was in Bangor. The Board believes the practical limitations of this analysis has been reached and is accepting the lower final background for a number of reasons (1) to do otherwise could jeopardize issuance of this license which would jeopardize operation of this mill therefore, the Board is prepared to accept less of conservatism in the analysis. (2) The Board is satisfied that there are large scale improvements appearing at Lincoln Pulp & Paper and that accurate estimation of environmental changes that will result is complicated and further theoretical calculations not worth the resources used to produce them. (3) In addition the analysis has some tendencies to over estimate resulting air quality because worst case background concentrations are assumed to occur at the same time and place that worst case Lincoln Pulp & Paper impacts occur. (4) The Board is also requiring in this order Lincoln Pulp & Paper to establish a fine particulate monitoring system to assess the presence of fine particles that have a greater health damage potential than larger particles on which the present data is based. Therefore, the Board will be able to assess the risk to health unaccounted for by omitting emissions from the modeling and assuming total elimination of mill chemicals in blowback adjustments to background.

In addition the Board notes that should this control strategy fail additional actions, already under consideration by Lincoln Pulp & Paper, can be taken to reduce emissions further. Conversion of an existing boiler or construction of a new boiler capable of utilizing wood waste and treatment plant sludge would reduce both particulate and sulfur dioxide emissions. Solutions to the dump problems would eliminate some fugitive emissions.

The staff determined two sets of TSP background concentrations: rural and urban. Rural annual concentrations are considerably less than used by Serrine and use of Serrine's concentrations will provide a greater protection of the standards. The staff 24-hour rural TSP background is 74 vs. the one overall background concentration used by Serrine of 69 ug/m³. Use of either background in the rural areas will not cause standard violations.

Background levels used for this analysis are as follows:

3 hour sulfur dioxide 85 ug/m³
 24-hour sulfur dioxide 24 ug/m³
 Annual sulfur dioxide 4 ug/m³
 24-hour TSP 69 ug/m³
 Annual TSP 33 ug/m³

Future monitoring may indicate these concentrations need to be adjusted.

7. STUDY RESULTS

The following table represents the results of the air quality's analysis:

TABLE
 Low Terrain Case (micrograms per cubic meter)

<u>Averaging Time and Standard</u>	<u>Background</u>	<u>LPP Max. Impact</u>	<u>Total</u>	<u>Standard</u>
3 hr.sulfur dioxide	85	1057	1142	1150
24 hr.sulfur dioxide	24	192	216	230
Annual sulfur dioxide	4	17	21	57
24 hr.TSP	69	73	142	150
Annual TSP	33	8	41	60

High Terrain Case (micrograms per cubic meter)

<u>Averaging Time and Standard</u>	<u>Background</u>	<u>LPP Max. Impact</u>	<u>Total</u>	<u>Standard</u>
24 hr.sulfur dioxide	24	269	293*	230
Annual sulfur dioxide	4	32	36	57
24 hr.TSP	69	49	118	150
Annual TSP	33	7	40	60

*Violation

In order to achieve these air quality levels the following actions must be taken:

- a. Install viscosity controls on the fuel supplies to power boilers #3 and 7;
- b. Install oxygen monitors on power boilers #1 and 3;
- c. Install wet scrubber on the lime slaker vent;
- d. Install a demister scrubber on the lime causticizer vent;
- e. Install wet bottom on the electrostatic precipitator controls for the recovery boiler (completed);
- f. Use only low sulfur 0.5 percent oil in power boiler #1;
- g. Limit the sulfur content of oil burned in power boilers #3,6 and 7 to 2.3 percent;
- h. Limit power boiler operation so that no more than two of the three largest boilers operate at any one time;
- i. Install air foil system on sawdust pile (completed);
- j. Implement mill road dust control program to include paving and sweeping of paved areas and chemical stabilization of the unpaved areas;
- k. Install a wet scrubber on the starch tank vent capable of achieving 70-90 percent efficiency;
- l. Install bag house on lime silo vent capable of achieving 99 percent control efficiency;
- m. Replace lime kiln induced draft expansion joint with permanent fix (completed);
- n. Overhaul the salt cake silo bag house, replace bags with ones of tighter mesh and reduce spillage through careful management;
- o. Maintain sufficient inventory and control of flow of black liquor to the recovery boiler such that the opacity standards are met and periods of switching to oil are limited
- p. Town of Lincoln must purchase and use a vacuum street sweeper in accordance with agreements with D.E.P.

Additional requirements placed on Lincoln Pulp & Paper so that the Board can order issuance of this license are:

- a. Upgrade meteorological monitoring data to eliminate local interferences, include temperature and stability and be of sufficient quality to enable use of onsite data in sequential models.
- b. Place and operate a second continuous sulfur dioxide monitor on Fish Hill near or in the area of maximum impact;
- c. Remodel high terrain using a sequential model using on-site meteorological data after one year of new meteorological data has been obtained;
- d. Place and operate for at least one year inhalable particulate monitor at the Thomas Motel site;
- e. Maintain the following monitoring program:
 - i. Thomas Motel site - continuous SO₂ TSP , inhalable TSP;
 - ii. Fish Hill base - continuous SO₂;
 - iii. Vocational Ed building - TSP;
 - iv. Lincoln Post Office (or its vicinity) - TSP;
 - v. Fish Hill (peak) - continuous SO₂;
 - vi. Continue petrographic analysis on all samples that show violations of TSP standards.

8. TOTAL REDUCE SULFUR (TRS) EMISSIONS

Section 111 of the Clean Air Act requires EPA to set performance standards for new sources commonly referred to as New Source Performance Standards (NSPS). Generally these emission standards are for "criteria pollutants" or pollutants for which an ambient standard has been established and emissions of which states already regulate from existing sources. Section 111-D requires the states to control emissions for other pollutants from existing sources when a NSPS is promulgated for a pollutant for which there is no existing standard. Since these pollutants do not have air quality standards they are commonly referred to as Section 111-D pollutants. Maine has chosen to comply with the requirements of this section on a case by case basis on each license.

EPA issued an NSPS for Kraft pulp mills that applies to new construction or modification after September 24, 1976. Since this was after replacement of much of the Lincoln Pulp & Paper mill equipment Lincoln Pulp & Paper is regarded as an existing source. One pollutant for which an NSPS was established for Kraft pulp mills was for TRS emissions from digesters, evaporators, black liquor oxidation systems or condensate stripping systems, and systems in which the gases are combusted, Kraft recovery furnaces, smelt dissolving tanks and lime kilns. LPP has the following equipment digesters, evaporators, smelt dissolving tanks brown stack washers, recovery boilers lime kilns. Lincoln Pulp & Paper installed equipment of modern design which is able to meet the EPA guidelines standards for TRS emissions from existing equipment. Those standards have been imposed on Lincoln Pulp & Paper in previous licenses. They are reimposed on this license.

ORDER

Based on the above the Board concludes that with the attached special conditions the Lincoln Pulp & Paper Company emissions will be receiving Best Practicable Treatment or reasonably available control technology will be applied as appropriate, will not violate applicable emission standards, or can be controlled so as to not violate the same, and either or alone or in conjunction with existing emissions will not violate, or can be controlled so as not to violate applicable ambient air quality standards, and the equipment to be used is reliable in design specifications, expected operated characteristics, and dependable in performance. The Board hereby grants an Air Emission License to Lincoln Pulp & Paper Company, Inc., subject to standard conditions a,b,c,d,e, and f plus the following special conditions:

- g. Place and operate for at least a one year period an inhalable particulate sampler at the Thomas Motel site by July 1, 1983;
- h. Upgrade within 7 months of the issuance of this order the meteorological monitoring data obtained from the Lincoln area to include hourly continuous wind speed, wind direction, and stability (sigma) data at a site to be agreed upon within one month of issuance of this order. If agreement onsite location does not occur within one month of issuance the location and deadline dates will be reconsidered by the Board. Sigma data are to be computed directly, through the application of the formula for a variance and not through a range estimator. The data should be collected at a height of 10 m above the ground, with the area surrounding the tower clear of obstructions from (including trees for a distance equal to at least 7.5, and preferably 10, times the height of the obstructions. If there are obstructions within 10 x their ht (but . 7.5) and it is determined from

the strip chart recordings that there is interference from these obstructions, either the obstructions must be removed or the sensor raised so it is reasonably unaffected. In addition, hourly temperature data from the Bangor FSS should be submitted to DEP on a regular basis with the onsite data. Instrument specifications shall follow EPA ambient monitoring guidance.

- i. Place and operate a second continuous sulfur dioxide monitor on Fish Hill peak at a location approved by the Commissioner by July 1, 1983;.
- j. Remodel the high terrain case using a sequential model with on-site meteorological data such as Complex I, after one year of upgraded meteorological data has been obtained. Achieve within 6 months of issuance of this order unless required earlier elsewhere and maintain the following monitoring network unless the Commissioner approves any alteration in this program:
 1. Thomas Motel continuous sulfur dioxide, 24 hour TSP, inhalable fine particulate monitor.
 2. Fish Hill base - continuous sulfur dioxide,;
 3. Vocational Education building - 24 hour TSP;
 4. Lincoln Post Office or its vicinity - 24 hour TSP;
 5. Fish Hill (peak) - continuous sulfur dioxide;
 6. Continued petrographic analysis and sulfate analysis on all 24 hour TSP violations.
- k. Control black liquor inventory and recovery boiler operations in such a manner as to comply with the opacity standards as indicated by the instack opacity monitor and limit the periods when oil is fired.
 1. Calibrate and maintain the recovery boiler instack opacity monitor in accordance with the manufacturer's specifications;
- m. Maintain and operate the recovery boiler electrostatic precipitator in accordance with manufacturer's specifications;

- n. Limit TRS emissions from the recovery boiler stack to not exceed 5ppm of TRS as H₂S, 12 hour average at eight percent oxygen;
- o. Treat all noncondensable emissions from the digester system, evaporators, smelt tank to achieve compliance with EPA TRS Guidelines for existing sources by December 30, 1984; unless after expeditions design, the Board finds that this date is unachievable;
- p. Limit TRS emissions from the lime kiln to 20ppm TRS as H₂S on a dry gas basis as a 12 hour average corrected to 10 percent oxygen and install an oxygen monitor by December 31, 1983;
- q. Maintain and operate the venturi scrubber on the lime kiln in accordance with manufacturer's specifications with at least 20 inches water column pressure drop, a media flow rate of 300 gallons per minute or greater and with a solids content of the media not to exceed 10 percent unless stack testing shows compliance can be attained at a lower differential pressure, lower media flow rate or higher solids content, and limit emissions from the lime kiln to not exceed 0.65 lbs./air dried ton;
- r. Limit sulfur content of oil used in boilers #3,6 and 7 to not exceed 2.3 percent sulfur as a one year running average, upon issuance of this order;
- s. Limit sulfur content of oil used in #1 boiler to not exceed 0.5 percent sulfur byweight by November 1, 1983;
- t. Install and operate fuel viscosity controls on boilers #3, 6, and 7 and oxygen monitors on boilers #1,3,6 and 7 and maintain a particulate emission rate of 0.12 lbs/million btu for each boiler by September 1, 1983
- u. Limit operation of boilers #1, 6 and 7 so that no more than two boilers operate simultaneously and that #6 boiler never operate alone except in the event of a Bangor Hydro Power outage or cold mill startup;
- v. Not operate power boiler #4 and 8/9;
- w. Perform stack testing for the recovery boiler and/or lime kiln in accordance with 40 CFR, part 60, methods 1-5, and submit the results to the Department of Environmental Protection as follows:
 - 1. By October 1, 1983 for the lime kiln and for the lime slaker vent at maximum normal production rates;

2. Within 60 days a written notice from the Department that the lime kiln venturi scrubber parameters indicate that the kiln may be operating out of compliance;
 3. Within 60 days of written notice from the Department of Environmental Protection that the opacity monitor fails to indicate compliance on the recovery boiler;
- x. Install and operate in accordance with manufacturers specifications a wet scrubber on the lime slaker vent capable of maintaining 95 percent control efficiency by July 10, 1983;
 - y. Install and operate in accordance with manufacturers specifications a wash demister pad scrubber on the lime causticizer vent capable of maintaining 70 percent particulate collection efficiency by July 10, 1983;
 - z. Install a baghouse on the lime silo vent capable of maintaining a collection efficiency of 99 percent by July 10, 1983 and operate the baghouse to keep opacity under 10%;
- aa. Install and operate a wet scrubber or alternative controls system subject to approval by the Commissioner on the starch slaker tank vent capable of maintaining a collection efficiency at least 70 percent by August 1, 1983;
 - bb. Unload sawdust from the conveyor to the pile in the vicinity of the air foil when sawdust is observed under any wind conditions to be migrating from the pile area during unloading operations. Unload using boots whenever pile goes below foil level. Should air quality data indicate violations due to sawdust emissions, unloading shall occur in the vicinity of the foils when average wind speeds exceed 10 miles per hour.
 - cc. Pave the area indicated on Attachment A and sweep weekly with a vacuum street sweeper, weather permitting, all paved areas indicated on Attachment A. Chemically stabilize other traffic area in the mill as indicated on Appendix A using the process indicated in the Sirrine Air Quality Analysis.
 - dd. Limit emissions from the smelt tank to not exceed 0.3 lb. particulate matter per air dried ton of pulp produced;

ee. Upon the occurrence of any of the following, the Board shall reopen this license and require such actions as may be necessary to achieve the air quality standards:

- 1. Any monitored sulfur dioxide air quality standard violation;
- 2. Any three monitored particulate matter air quality standard violations within any 12 month period in which saltcake either is the primary air contaminant, by weight, or makes a substantial contribution to the violation;
- 3. Any three monitored particulate matter air quality standard violations within any 12 month period in which lime either is the primary air contaminant, by weight, or makes a substantial contribution to the violation;
- 4. Any three monitored particulate matter air quality standard violations within any 12 month period in which sawdust either is the primary air contaminant, by weight, or makes a substantial contribution to the violation.

ff. Maintain for the period of this license adequate records to prove to the satisfaction of the Commissioner that the licensee is in compliance with conditions k, l, m, n, o, p, q, r, s, and v.

DONE AND DATED IN AUGUSTA, MAINE THIS NINTH DAY OF MARCH 1983.

BOARD OF ENVIRONMENTAL PROTECTION



 HENRY E. WARREN, CHAIRMAN

*Copy mailed to
 Doug Walsh
 Aug 3-22-83 m
 Cert. # 9040437*

*Copy to Hinger Davis, NRC
 Aug Sample
 J. J. Emery
 G. J. Chandler
 All Board members
 given or mailed 4-21-83*