

Final Project Agreement
May 31, 2000

Georgia - Pacific Corporation
Big Island, Virginia
Project XL
Final Project Agreement

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I. Introduction to the Agreement

A. Project Summary

Georgia-Pacific Corporation owns and operates a non-sulfur, non-bleaching, semi-chemical pulp and paper Mill in Big Island, Virginia (Mill). The Mill produces corrugated medium and liner board (the inside and outside components of cardboard) from hardwood pulp and secondary recycled fiber. The Mill is subject to the Pulp and Paper Mill Cluster Rule (a hazardous air pollution standard promulgated under the federal Clean Air Act (CAA)), which is based on installation of Maximum Achievable Control Technology (MACT) on regulated emission sources. A second MACT standard applicable to pulp and paper Mills (MACT II), was proposed on April 15, 1998 to specifically address emissions from combustion sources associated with the recovery of pulping chemicals. At the Mill pulping liquor is added to hardwood chips, and the mixture is passed through digesters to produce the pulp. Presently the Mill takes the spent pulping or black liquor, reduces it through evaporation, and flame combusts the resultant concentrated liquor in two "smelters," also called "recovery furnaces." The smelters recover the sodium carbonate in a molten smelt that is then dissolved in water to produce new pulping liquor.

Due to the age and physical condition of the existing smelters at the Mill, to comply with MACT II Georgia-Pacific would have to substantially upgrade or rebuild these units and add additional emission control devices. Alternatively, they would need to replace the smelters with a new recovery boiler that uses conventional technology. Georgia-Pacific has investigated, and proposes to install, a third alternative for recovering pulping chemicals at its facility, using an innovative black liquor gasification system. Under this alternative, the concentrated black liquor would be pyrolyzed (thermal conversion of organic compounds) to liberate a combustible gas (primarily hydrogen), which in turn would be burned as an energy source to drive the pyrolysis and to produce steam to be used elsewhere in the Big Island facility. Sodium carbonate pellets would be recovered during this process for reuse in fresh pulping liquor.

Georgia-Pacific's proposed installation of a black liquor gasification system would be the first commercial application of this innovative gasification technology in the United States. Deployment of the proposed gasification technology promises reduced consumption of fossil fuel, increased efficiency in energy conversion and chemical recovery, elimination of the smelt-water explosion hazard (inherent to the operation of conventional recovery boilers), reduced maintenance costs, and significantly lower environmental emissions of criteria pollutants (particulate, SO₂, NO_x, VOC, CO), greenhouse gases' and Hazardous Air Pollutants (HAPs). If Georgia-Pacific experiences no problems or delays in construction and testing of the

gasification technology, Georgia-Pacific expects that its gasifier could be operational in time to meet the MACT II standards when they become effective. However, Georgia-Pacific is pursuing an XL Project for its Mill for the following reasons:

- 1) to be able to operate the existing smelters past the as otherwise applicable MACT II compliance date, if necessary, while the gasification system is brought on line and tested, and during Kraft liquor trials;
- 2) to assure that if the gasification system fails, Georgia-Pacific would be allowed to operate its existing smelters, as necessary, past the MACT II compliance date while it constructs a conventional recovery boiler; and
- 3) to allow the steam generated by the new process to be utilized elsewhere at the Mill.

This project does not include modifications to production areas of the Mill. This project is not intended to increase pulp or paper production. The new gasification system will be similar in capacity to the existing smelters.

B. Purpose of the XL Program

The U.S. Environmental Protection Agency (EPA), with the cooperation of State and local authorities, has initiated Project XL to work with interested companies or other potential Project Sponsors to develop innovative approaches to environmental protection. Project XL encourages potential sponsors to come forward with new approaches that can advance our nation's environmental goals more effectively and efficiently than current regulatory and policy tools or procedures. Project XL provides an opportunity for outside Parties, including local community and environmental groups, to be involved in the project. This "Stakeholder" process allows all interested individuals or groups to have input, voice concerns, and help shape the final project. This process is described further in section III.C.

C. Purpose of this Final Project Agreement

This Final Project Agreement (Agreement or FPA) is a joint statement of the plans, intentions, and commitments of the U.S. Environmental Protection Agency (EPA), USDA Forest Service, Virginia Department of Environmental Quality (VADEQ), Georgia-Pacific Corporation, and other Stakeholders, to carry out this demonstration Project at Georgia-Pacific's Big Island, VA Facility. This Project will be part of EPA's Project XL program which promotes innovative approaches to environmental protection. This Agreement does not create legal rights or obligations and is not an enforceable contract or a regulatory action such as a permit or a rule. The previous statement applies to both the substantive and the procedural provisions of this Agreement. While the Parties to the Agreement fully intend to follow these procedures, this Agreement by itself does not legally obligate them to do so. Federal

and State flexibility and enforceable commitments described in this Agreement will be implemented and become effective through a legal implementing mechanism such as a rule or permit. All Parties to this Agreement will strive for a high level of cooperation, communication, and coordination to assure successful, effective, and efficient implementation of the Agreement and the Project.

D. List of the Parties that Will Sign the Agreement

The Parties to this Final Project XL Agreement are the EPA, VADEQ, USDA Forest Service, and Georgia-Pacific. Citizen stakeholders and other organizations will not be signatories to the document, but are encouraged to write separate letters of support of the FPA or to file letters of objection in the event they did not agree with the consensus. See III. C. Stakeholder Involvement and Support for additional information.

E. List of the Project Contacts

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II. Detailed Description of the Project

A. Description of the Facility

Georgia-Pacific owns and operates a non-sulfur, non-bleaching pulp and paper Mill at Big Island, Virginia. The facility produces two products: corrugating medium, which is used by box manufacturing plants to make the fluted inner layer of corrugated boxes; and linerboard, which is used for the inside and outside layers of the boxes. "Medium" is made from semi-chemical (sodium carbonate/sodium hydroxide) hardwood pulp and secondary (recycled) fiber, and linerboard is made from fiber recycled from old corrugated containers, clippings and rejects from corrugated container manufacturing plants, and some mixed office waste paper. The Secondary Fiber (OCC) Mill produces an average of 950 tons per day and supplies 100% of the fiber for the linerboard Mill and about 20% of the fiber for the medium Mill. The paper Mills produce an average 870 tons per day of corrugating medium and 730 tons per day of linerboard.

The Mill is located in Bedford County, adjacent to the James River, which is the dividing line between Bedford and Amherst Counties. Big Island is approximately 20 miles northwest of Lynchburg, Virginia. The main operating area of the Mill is located along, and just east of, U. S. Highway 501 in Bedford County. About 2 miles north of the Mill, U.S. Highway 501 intersects with the Blue Ridge Parkway, which runs in a southwest to northeast direction. The James River borders the main operating area of the Mill on the east. The Mill owns additional land, and operates a landfill, east of the river, in Amherst County, Virginia.

A principal concern for this area is air quality due to the close proximity of the Big Island facility to the James River Face Wilderness. The James River Face Wilderness is about 3 miles to the northwest of the Mill and is a Federal Class I air quality area. The USDA Forest Service, a signatory to this FPA, is the designated Federal Land Manager for assuring that the air quality criteria for this designated Class I wilderness area are maintained. Other areas nearby include the George Washington National Forest to the north and east, and the Jefferson National Forest to the west.

To the west of the Mill lies the un-incorporated village of Big Island. The population of the village is approximately 400. The population within a five-mile radius is about 2,100. Within a twenty-five mile radius of the Mill (which includes the city of Lynchburg), is a population of approximately 111,500.

B. Description of the Project

The Mill currently takes the spent liquor from the wood pulping operations, reduces its water content by evaporation by using a conventional multiple effect

evaporation train, and combusts the resultant concentrated (about 60% solids) liquor in two smelters. Molten smelt is discharged from the smelters and dissolved in water to recover the sodium carbonate. This solution is used to make up the cooking liquor added to the hardwood chips going to the digesters (cooking vessels) to produce the pulp.

The proposed MACT II¹ is a performance-based regulation the purpose of which is to reduce HAPs; it does not specify a particular technology that must be used to meet its emission standards. To meet the standard proposed in the MACT II regulation, the current smelters would require a substantial upgrade. The age and physical condition of the smelters themselves would require that they be rebuilt with additional emission control devices or replaced with a conventional technology recovery boiler. Georgia-Pacific has investigated, as a third alternative for chemical recovery, a PulseEnhanced™ Steam Reforming black liquor gasification system to replace the existing smelter type recovery furnaces. The Parties believe implementation of this system will allow the Big Island facility to reduce emissions well below the proposed MACT II emission standards, and will significantly lower emissions of other criteria pollutants compared to installation of conventional technology.

Georgia-Pacific is seeking regulatory flexibility under federal and state air regulations to accommodate bringing this new technology on line. This requested flexibility is detailed in Section IV of the Agreement. Additionally, Georgia-Pacific seeks the ability to utilize the steam generated from this unit in place of steam currently being generated from the high-cost natural gas fired boiler.

The Parties believe that gasification of black liquor represents a new and better approach for the chemical recovery process and eliminates many of the deficiencies of the conventional recovery furnace and fluid bed combustion technologies. The benefits of gasification to the paper industry, generally are expected to include: increased efficiency in energy conversion and chemical recovery, elimination of the smelt-water explosion hazard, reduced operation and maintenance costs, and significantly lower environmental emissions. The expected emissions to be reduced include: particulates (PM, PM₁₀), Sulfur Dioxide (SO₂), Total Reduced Sulfur (TRS), Nitrogen Oxides (NO_x), Volatile Organic Compounds (VOC), Carbon Monoxide (CO), HAPs, and greenhouse gases, specifically Carbon Dioxide (CO₂). These benefits are particularly attractive to pulp Mills such as Georgia-Pacific's Big Island that use a semi-chemical non-sulfur process that requires auxiliary fossil fuel to sustain combustion of the black liquor. Actual benefits to the Big Island facility and surrounding areas, include significant reductions in SO₂, NO_x, VOC, CO, and particulates.

¹ MACT II and many other terms used in the FPA are defined in the Glossary of Terms in Appendix 1

Georgia-Pacific has evaluated and plans to install the PulseEnhanced™ Steam Reforming chemical recovery system, developed by StoneChem, Inc. This technology converts the organics in the spent pulping liquor to a hydrogen-rich gas fuel, without combustion, leaving the chemicals (sodium carbonate) for reuse. The gas fuel can then be used as a low emission energy source for heat in the gasification unit and as an alternative boiler fuel, replacing fossil-fuel based (non-renewable) natural gas.

C. Specific Project Elements

Please see Appendix 2 for an expanded schedule and milestone descriptions.

1. Project Element 1: Final Project Agreement and DOE Partial Project Funding.

In order for Georgia-Pacific to commit the funds necessary to construct the gasification system, two items must be secured: acceptance of the Final Project Agreement with all requested regulatory flexibility, and an executed Agreement with the Department of Energy (DOE) for partial funding of the project. The cost of implementing this project as the first commercial scale, black liquor gasification system, far exceeds the cost of putting in place conventional chemical recovery technology. As such, the DOE funding is crucial to Georgia-Pacific's final decision to proceed. Moreover, the involvement of the DOE will have a direct bearing on construction and start-up schedule.

Just as crucial to implementation of the project is Georgia-Pacific's being granted regulatory flexibility in accord with this Final Project Agreement. The stakeholders recognize that the black liquor gasification system is a comparatively new technology, and that Georgia-Pacific may need additional time for commissioning or, in the worst case scenario, will require an extended time period for replacement of a failed gasification system with a conventional recovery boiler. The stakeholders also recognize that Georgia-Pacific is depending on being able to use the steam generated by the gasification system to replace the higher cost steam generated in its natural gas-fired boiler. The ability to use the steam will be obtained by changing an existing permit issued by VADEQ according to state and federal regulations.

2. Project Element 2: Regulatory Action

Virginia State Air permitting will be required for the construction and operation of the new gasification system and operation of the smelters during the Kraft liquor trial. Georgia-Pacific will be working with the State and other agencies to develop the permits. Additionally, Georgia-Pacific is requesting to use

steam generated from the new unit to replace steam generated by the natural gas boiler, that will require a change to an existing permit.

Finally, a federal site-specific provision in the CAA MACT II will be required to allow the time flexibilities discussed in this FPA.

3. Project Element 3: Construction

The construction phase of the project will begin after the culmination of the above- mentioned Agreements. Georgia-Pacific will not purchase equipment for the gasification system unless and until DOE funding has been approved, and a cooperative Agreement with the DOE has been executed.

4. Project Element 4: Commissioning

Due to the innovative nature of the technology and the fact that the equipment has never been operated on a commercial scale, this FPA includes a schedule that will permit the adjustment or modification of parts of the process or equipment to ensure their proper functioning. During this time, Georgia-Pacific operators, engineers and maintenance personnel will learn how to operate the equipment more efficiently. During the commissioning period each part of the chemical recovery system will be checked to ensure it is complete, installed properly, and operational. After individual parts are checked, the entire system will be operated for a period of time to ensure it is functioning properly. Commissioning will conclude with the successful completion of the gasification technology supplier's performance warranty demonstration. This demonstration comprises a series of trials to prove the technology and equipment are capable of performing to the contractual levels, required prior to release of final payment to the supplier.

5. Project Element 5: Start-up

a. Gasification System

For this innovative XL project, start-up of the gasification system will occur at the end of the commissioning phase and in any event no later than three years following the execution of the Department of Energy Cooperative Funding Agreement for this project. For the purposes of this FPA, the term "start-up" refers to the gasification system unless otherwise noted. This start-up date will trigger the 180-day period for performance testing as may be required by the site-specific MACT II.

b. Boiler Subsystem

The boiler portion of the gasification system (also identified as the gasifier boiler and HRSG2 in this project) meets the definition of an “affected facility” as contained in the Federal New Source Performance Standards (NSPS) subpart Db. As stated in State regulations 9VAC 5-50-20 B, the state construction permit will require that this portion of the gasification system be tested in accordance with the requirements of NSPS subpart Db. As defined in both the State regulations and 40 CFR 60 (Federal New Source Performance Standards), start-up means the “setting in operation of an affected facility for any purpose.” Consequently, the boiler subsystem may achieve “start-up” and therefore, trigger NSPS testing requirements, before the gasification system achieves “start-up”.

6. Project Element 6: Kraft Liquor Trials

As a condition of receiving DOE funding, there also will be a trial on Kraft black liquor. This trial will be detailed at a later date; however, it is anticipated that the trial will take place after start-up of the gasification system and not last more than three weeks (500 operating hours). Georgia-Pacific anticipates some gasification system downtime during the Kraft liquor trial, such as to make adjustments to optimize gasification operations. As a result, the total time period encompassing the 500-hour Kraft trial could be as much as 1500 hours. During the trial, the Mill will process the Kraft liquor through one of the gasification vessels, while the other vessel remains out of service. The Kraft liquor feed to the gasification system will be limited to allow the gas clean-up equipment to maintain adequate performance. Georgia-Pacific will maintain the emissions from the stack at or below the total levels stated in the construction permit for the gasification system. This will be accomplished by a combination of limiting the amount of Kraft liquor processed as well as temporary modifications to the equipment or process. During the trial phase, it will be necessary to maintain separation of the process chemicals of the trial liquor and the Mill liquor. To do that, the smelters will need to be operated during this time period to process the Mill’s black liquor. Therefore, the Mill will be processing more liquor during this time period than is normal and the emissions will increase as well. The excess green liquor produced, as well as any sulfur containing green liquor from the H₂S Absorber, will be returned to the facility that supplies the Kraft liquor. Flexibility required for this project element is described in Section IV.A. Georgia-Pacific will work with the Forest Service to determine the time that will have the least impact on the Class I Wilderness area and will attempt to hold the trials at that time.

7. Project Element 7: Air Emissions Performance Testing

a. Background

The VADEQ permit to construct and operate the new chemical recovery system at Big Island will include emission limits. Generally, the permit will set initial limits based on the estimated (higher) emission rate for each pollutant that would be expected if using conventional recovery boiler technology. These limits will satisfy the existing state and federal requirements as well as the proposed requirements of MACT II.

b. Initial Performance Test(s) of emissions

The VADEQ construction permit may include pollutant-specific emissions testing in order to verify the initial performance of the chemical recovery system. The scope of these tests will be determined from federal and state requirements in effect at that time. The state requirements will be determined by VADEQ's assessments of the reliability of data on which the initial permit limits are based, which in turn will be based on the maturity of technology and department's familiarity with it. Any required initial tests will have to be performed not later than 180 days after start-up as defined in Project Element 5. The measurement location for these tests will be the exhaust stack. Process parameters will be measured during testing.

c. Emission-limit-reducing Performance Tests

If the black liquor gasification technology option is constructed, it is expected that the actual emissions of most, if not all, pollutants will be substantially lower than the emissions limits set by the initial permit that will have been based on the expected emissions for conventional recovery boiler technology. Therefore, in addition to the performance testing described above, the construction permit will describe a method to reduce the permitted emissions to a level representative of the actual emissions from the black liquor gasification system. The emission-limit-reducing performance tests will be a series of tests to account for variations in system performance caused by factors such as the seasonal variations in raw materials, possible process degradation, and the learning curve of the operators. These tests will be specific for the criteria pollutants and HAPs as defined in the construction permit. This series of tests will commence after the black liquor gasification system operation has been stabilized, tuned, and normalized, but not later than 1 year after system start-up. It is anticipated that these tests, upon which revised permit levels of emissions will be established, will be completed within two years after start-up. However, based on permitting experience of the VADEQ, these tests may take up to four years from start-up of the unit to completion of the performance testing due to unanticipated systems degradation. The Stakeholders recognize the inherent difficulty in achieving

optimal performance with an untried technology and believe that allowing Georgia-Pacific time to come to actual operating conditions will enable environmental regulatory authorities to set appropriate final emissions limits. Any requests for deviation from this time frame will be considered by VADEQ.

The VADEQ will analyze the results of this series of tests and apply a compliance safety factor to reduce the allowable emission limits in the construction permit through a permit amendment. The construction permit emission-limit-reducing method will not allow for increases in allowable emission rates. Any requests for such increases will be subject to the appropriate state permitting review.

d. Air Emission Testing not covered by Virginia Permitting

HAP characterization of the gasification system emissions will be performed once during normal operation of the gasification system (no later than two years after start-up) on Mill liquor and once during the Kraft trial, using test methods acceptable to the EPA. Currently, Georgia-Pacific anticipates using the Fourier Transform Infrared Spectroscopy (FTIR) methodology. As the time approaches for the testing to occur, Georgia-Pacific and appropriate EPA representatives will reevaluate current test methodology and jointly select the method best suited for the desired information. The selection will be based on method applicability, reliability, and economics.

8. Project Element 8: Time Flexibility

Should the commissioning phase (Project Element 4) extend past the as otherwise applicable MACT II compliance date, the Mill will require regulatory flexibility in order to continue to operate the smelters, whose operation is necessary to keep the Mill running.

9. Project Element 9: Failure Contingency

Should the gasification technology fail, Georgia-Pacific expects to install alternate technology (Conventional Recovery Boiler) in its place. The smelters will need to be operated during the recovery boiler construction period to maintain Mill operation. Assuming MACT II has been made final, the smelters will be operating after the as otherwise applicable MACT II compliance deadline. Georgia-Pacific anticipates that it will take three years from the date it determines that the gasification system has failed to construct the recovery boiler and make it operational.

The stakeholders recognize that Georgia-Pacific intends to make a significant commitment of time and resources to the implementation of the project. The stakeholders also recognize that ultimately Georgia-Pacific alone will define and decide the success or failure of the gasification project, including how much Georgia-Pacific effort, manpower and assorted resources it should continue to invest in the project if Georgia-Pacific experiences difficulties in its construction or operation. Georgia-Pacific recognizes that in the event it determines that construction of the gasification system will be delayed, or that a conventional recovery boiler system must be installed, the stakeholders should receive a full explanation of the basis for Georgia-Pacific's decision.

In assessing the success/failure of the project Georgia-Pacific will consider the project's ability:

- (1) to achieve and maintain continuous compliance with environmental requirements,
- (2) to operate in a fashion that does not present unreasonable risks to human life, health, or property,
- (3) to support the Mill's requirements for the recovery of process chemicals, and
- (4) to operate economically, considering relative energy, operating and maintenance costs.

No later than 6 months after Start-up, Georgia-Pacific will determine whether the project is successful or must be replaced with alternative technology. Once this determination has been made Georgia-Pacific will send written notification to all of the stakeholders. If the project is deemed a failure, a three-year period to install this technology will be started at this time.

III. How the Project Will Meet the XL Acceptance Criteria

A. Superior Environmental Performance

1. Environmental Performance without Project XL

Without Project XL conventional recovery technology would be installed with control equipment designed to operate with emissions at or below the MACT II limits as established by the construction permit (see table below).

2. Environmental Performance if Project XL is Implemented

Based on the limited data available from the gasification system pilot trials to date, emissions were estimated and compared to those estimated from a conventional recovery boiler with current Best Available Control Technology (BACT) type controls. A comparison of predicted emissions from the current technology (smelters), black liquor gasification system technology, and a conventional recovery boiler is listed below:

Table 1
Comparison of Chemical Recovery Units

Pollutant	Without Project X/L		With Project XL		Without Project X/L		With Project XL	
	Smelter	Recovery Boiler	Smelter	Gasification System	Smelter	Recovery Boiler	Smelter	Gasification System
	tons/year				lbs/ton BLS*			
NOx	168	90.4	19.3		4.90	2.48	0.53	
SO2	13	10.3	1.1		0.39	0.28	0.03	
CO	7,592	146.1	11.7		221.00	4.00	0.32	
CO2	103,450	117,800	96,662		3,015.40	3,227.40	2,648.27	
VOC	1,646	7.5	0.88		47.90	0.21	0.02	
Particulate	440	14.8	1.88		12.80	0.41	0.05	

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Note: BLS – Black Liquor Solids. Table assumes 800 tons per day of semi-chemical virgin pulp production, or 400,000 pounds per day of BLS.

The estimated emissions calculations are based on operating the pulp Mill at 800 tons per day annual average. (In 1999, the pulp Mill ran at approximately

90% of this number.) The projected gasification system emissions are based on best available information but are not vendor guaranteed. Since this will be the first, full-scale unit, it is not possible to predict precisely the level of emissions that will ultimately be achieved. The units used in this table are tons per year, which show the total annual emissions for each pollutant, and pounds per ton of black liquor solids (BLS) which describes the amount of pollutant emitted for each ton of black liquor solids that is consumed.

The column labeled “Smelters” shows calendar year 1999 emissions (using existing technology) extrapolated up to 800 tons per day from the pulp Mill. The column labeled “Recovery Boiler”, shows the estimated maximum emissions if this XL Project is not approved or if the technology fails and a conventional recovery boiler is installed. The column labeled “Gasification System” shows the estimated maximum emissions using the new gasification technology. The emission of regulated hazardous air pollutants (HAP) is the reason the existing smelters fall under the proposed MACT II regulations. Georgia-Pacific expects that recovery boiler emissions for HAPs would meet the new emission limitations in the proposed regulations. However, as is evident from the table, the gasification technology will further reduce all emissions, including the VOCs, which include the regulated HAP compounds. The Parties believe the available data demonstrates that the gasification system is more desirable than a conventional recovery boiler. It is anticipated that additional data on HAP emissions, collected after the gasification system is operational, will confirm the belief that the low VOC data correlates with low HAP emissions.

The effect on total Mill emissions is another way of evaluating the benefit of the gasification project. The following table, (Table 2) reflects how this XL Project will impact the total Mill emissions. The emissions are estimated assuming 800 tons per day production from the pulp Mill and the new steam generated will offset steam from the natural gas boiler. The first column represents what the emissions would be if the Mill continued to use its existing technology (smelters). The second column shows what the emissions would be without Project XL (Conventional Recovery Boiler) and the third column show emissions with a successful XL Project (Gasification System).

Table 2
Annual Mill Emissions
Tons/Year

Parameter	Estimated Total Mill	Without Project XL Recovery Boiler	With Project XL Gasification System
NOx	988	922	849
SO2	1324	1322	1312
CO	8121	1288	1148
CO2	N/A	N/A	N/A
VOC	2149	561	554
Particulate	475	97	84

In addressing the ability to use the steam generated by the gasifier anywhere in the Mill, data was generated to compare the effect on emissions depending on which existing boiler's steam is offset with the new steam. The next table (Table 3) shows this comparison. The data reflects estimated emissions assuming a pulp Mill production rate of 800 tons per day. The first column shows what the emissions would be if the Mill continued to use its existing technology (smelters). The second column shows the total emissions if steam from the natural gas boiler was replaced by steam from the gasification system. The ability to replace this more costly steam is necessary to make this project economically feasible. The final column shows what the emissions would be if the gasification system steam was used to offset steam from the coal and refuse boilers.

**Table 3
Steam Generation Scenarios**

Tons per Year

Parameter	Estimated Total Mill	Using Gasification System Steam to replace natural gas steam	Using Gasification System Steam to replace Coal & Refuse Steam
NOx	988	849	729
SO2	1324	1312	1144
CO	8121	1148	1121
CO2	N/A	N/A	N/A
VOC	2149	554	548
Particulate	475	84	83

While plant-wide emissions would be lower if Georgia-Pacific were to replace steam from the coal and refuse boilers, this would result in a potential loss of \$700,000 per year in fuel savings. This annual cost savings is imperative to the project being economically viable for Georgia-Pacific. Without these savings the gasification project would be abandoned and a conventional recovery boiler would be constructed. The Gasification project would be constructed as soon as the State permit and DOE funding allow which could occur before MACT II requires. Please see Section III.H for further discussion of the risks involved in project failure and not doing the project.

Additionally, there is potential environmental benefit in using the residue from the green liquor filtration system as an agricultural soil amendment. Initial analyses indicate a high calcium carbonate content in this residue. Once the system is operational, samples will be collected and analyzed to determine its potential use. This could divert an estimated 20 cubic yards of waste per day from the Georgia-Pacific landfill.

B. Anticipated Benefits, such as Cost Savings, Paperwork Reduction, and Operational Flexibility

The installation of the first commercial black liquor gasification system poses considerable financial risk but could generate some cost savings compared to installation of a conventional recovery boiler. The estimates of investment capital for a black liquor gasification system versus recovery boiler are \$36 Million versus \$25 Million. The comparison on estimated annual operating costs are \$2.1 Million

versus \$2.5 Million. This \$400,000+ annual saving in operating costs is a significant factor in choosing this technology over a recovery boiler. As part of its evaluation of proceeding with the black liquor gasification system, Georgia-Pacific has been discussing with the DOE its willingness to provide some cost sharing to mitigate the risk of constructing a full scale demonstration unit. While the DOE has expressed considerable support and willingness to participate, funding for a project can only be guaranteed for one year at a time. Additionally, the percentage of DOE participation is uncertain and their involvement might also require engaging in a competitive, “open solicitation” process for funds. Georgia-Pacific intends to continue its solicitation of DOE funds for this project and will request 50% funding. This percentage of funding is crucial to the final decision to move forward with this project. Commercial demonstration of the technology could result in future installations producing more substantial economic benefits through improved capital effectiveness. History has shown that first time installations incur much higher costs than subsequent installations. This demonstration should allow future installations at other facilities to occur at lower capital costs.

Besides the environmental and energy benefits described above and in the section on innovation, the black liquor gasification system would have a safety benefit over a recovery boiler. In the black liquor gasification process the concentrated liquor is pyrolyzed by heat applied indirectly through the heater units liberating the gas, which is burned as part of the energy source for the heaters. The sodium carbonate pellets are drawn from the fluidized bed into a conventional dissolving tank. Other gasification and recovery technologies utilize flame combustion within a reactor vessel or an intermediate smelt phase. The steam reformed black liquor gasification process thus eliminates the potential for smelt water explosions, which are a major safety concern in the operation of recovery boilers.

C. Stakeholder Involvement and Support

The XL process has included developing an ongoing dialogue with a mix of stakeholders from the local community, as well as interested state and federal organizations, such as the USDA Forest Service, National Park Service and the DOE, in addition to the VADEQ and EPA. (See Appendix 3 for the complete list) G-P plans to maintain regular communication with all the current stakeholders as well as others that may express interest throughout the life of the project.

Prior to beginning the FPA development process, meetings were held with VADEQ, Southern Environmental Law Center, the Sierra Club (VA Chapter), as well as several public meetings in Bedford and Lynchburg, and a regularly scheduled Big Island community meeting. Information about the project was distributed to local newspapers, radio and TV stations.

Once the FPA negotiation process began, a series of eight stakeholder meetings were held. The first two meetings included tours of the Big Island facility and

detailed briefing and discussions of the Mill's operations, manufacturing process, the proposed gasification system process and the anticipated air quality improvements associated with the proposed new equipment.

A collection of project documents has been established in the two local county libraries in Big Island, (Bedford County) and Amherst (Amherst County). The address and telephone numbers for these libraries are at the end of Appendix 3. These collections contain records of all stakeholder meetings, identification of the stakeholders, relevant materials and minutes. Those on the project mailing list, including all stakeholders, participants in the FPA development process and any members of the general public who have expressed interest in the project, have received copies of all minutes and other materials from the meetings, including drafts of the FPA. The stakeholders and interested Parties on the project mailing list can be found in Appendix 3. EPA has established a web-site located at www.epa.gov/Projectxl that also contains project documents.

The stakeholder participants agreed to act as an advisory group and further agreed on a consensus method of decision-making. In the event of lack of consensus, the group decided that a simple majority of the stakeholders would make a determination. The FPA will be signed by, Georgia-Pacific, EPA, the USDA Forest Service, and VADEQ. Other stakeholders will not be signatories to the document, but are encouraged to write separate letters of support of the FPA or to file letters of objection in the event they did not agree with the consensus.

Future Stakeholder Involvement

US EPA will provide a 14-day public comment period after publication of the notice of availability of the draft FPA in the Federal Register, at which time stakeholders again will have an opportunity to review and comment. EPA will brief the stakeholders following the comment period and discuss any necessary adjustments in response to the comments received from the public at large. After consideration and incorporation of any additional changes as appropriate to the public response, the formal signing of the Final Project Agreement will occur. Further, as construction starts, the stakeholders will be kept informed of progress through the following:

- (1) the quarterly newsletter mailed to the community and stakeholders;
- (2) DOE update reports; and
- (3) EPA XL Project summaries available at the EPA web site, placed in the project repositories in the local libraries and mailed directly to stakeholders.

In addition, the annual Mill Community Meeting, held during the third week of February each year, will discuss the XL Project along with other topics of local interest. A second meeting, focusing in greater detail on the status of the Project, also will be scheduled mid-summer each year for the duration of the project for the community and other interested stakeholders. All these reports and regular meetings will track progress and verify such progress with data summaries.

See the schedule in Appendix 2 Schedule and Milestones for specific dates and details of future stakeholder updates and meetings.

D. Innovative Approach and Multi-Media Pollution Prevention in the Project

Since about the mid 70s, the pulp and paper industry around the world has been searching for ways to make its energy conversion systems more efficient and less capital intensive, while improving safety and environmental standards. One of the technologies that has been evaluated is gasification. Gasification can be defined as the conversion of low cost organic solids or liquids into clean burning gases for replacement of expensive fossil fuels. The pilot studies and conditions within the industry are converging to create a window of opportunity to commercialize this technology. Three situations creating this window are:

- 1) The scientific community and suppliers have brought the technologies to the point where a first large-scale demonstration is the next step;
- 2) The capital replacement cycle and pending MACT II requirements will result in the industry focusing on significant rebuilds or replacements of its powerhouse infrastructure;
- 3) The current world emphasis on global climate change may provide significant additional incentive to utilize this technology because of the reduced fossil fuel usage and subsequent reduction in greenhouse gas emissions.

Specifically for Big Island, the predicted total thermal efficiency of the black liquor gasification technology is slightly better than that for conventional recovery boilers. The black liquor gasification system does not require auxiliary fossil fuel to maintain a stable, liquor combustion, as is the case for a conventional recovery boiler. Reducing the Mill's consumption of fossil fuels while maintaining the same level of production is a clear demonstration of pollution prevention and innovation.

E. Transferability of the Approach to Other Entities or Sectors

Successful completion of this project will demonstrate this technology to be capable of providing the full chemical recovery capacity for a semi-chemical Mill. The Parties expect the project will demonstrate the reliability and operational flexibility of the technology and all of the associated equipment. Once the technology is demonstrated, the industry can apply it at other pulp and paper facilities to obtain better energy conversion, improved safety, and environmental performance. The Big Island semi-chemical Mill is similar in characteristics to 12 other Mills in the U. S. producing virgin medium for containers. Success and demonstration of this technology at Big Island would also contribute significantly to

its implementation in the much larger number of Kraft Mills based on the trial to be run using Kraft black liquor. This technology also has applications for the conversion of non-wood liquors, sludges, and agricultural wastes to energy.

Additionally, the energy efficiency of this technology, once demonstrated, will produce steam as a by-product of the chemical recovery process, which can offset steam generated with fossil fuel.

In addition to producing steam, gasification technology could be used to generate on-site electricity, thereby offsetting the Mill's demand for electricity purchased from the utility grid. By configuring the black liquor gasification system to burn the product gas in a combined cycle gas turbine system, energy released in the chemical recovery process would be harnessed to generate clean electricity. The subsequent reduction in fossil fuel use would dramatically decrease production of greenhouse gases. Compared to average utility grid emissions, generating electricity from a gasification unit would result in lower emissions of conventional air pollutants. Displacing old, coal based utility boilers with a biomass based fuel, in this instance black liquor, would significantly lower emissions of CO₂, a pervasive greenhouse gas (GHG) contributing to global climate change. When this technology can be successfully demonstrated with combined cycle technology and utilization of available biomass, current studies show that the energy savings could result in the Pulp and Paper Industry being a net exporter of electrical power instead of the industry importing 6 gigawatts. The studies also indicate that as an industry, successful development of gasification technology would result in the potential to decrease greenhouse gas emissions by 18 Million metric tons per year. [Source: The Forest Products Industry Gasification Combined Cycle Initiative, American Forest & Paper Association (AF&PA) Agenda 2020, July 1998 www.agenda2020.org]

F. Feasibility of the Project

From a financial perspective, Georgia-Pacific is currently poised to make the necessary investments to proceed with implementation of gasification system technology at the Big Island facility, provided that the FPA and State air permits are successfully negotiated, and the DOE provides the anticipated funding. Georgia-Pacific realizes that annual DOE funding is not guaranteed, and is prepared to accept the remaining financial burden, should DOE funds not be available in subsequent years.

The PulseEnhanced™ Steam-Reforming Gasification technology, developed with research funding from the U.S. Department of Energy, is currently at the point in its development to be instituted in a full-scale operation. Pilot scale studies have proven its capabilities and superior attributes over current recovery technology. The

following is a list of the Steam-Reforming Gasification pilot studies performed by the technology developers:

- Pilot plant in Zaragoza, Spain, processing 240 kg/day silica-laden straw pulping liquor.
- Pilot testing of silica-laden rice straw spent liquor from RAKTA Mill in Alexandria, Egypt.
- 25-ton per day demonstration plant for spent liquor from bagasse and straw pulp, Erode, India, sponsored by the U.S. Agency for International Development.
- 50-ton per day demonstration at the Weyerhaeuser Company Kraft pulp Mill in North Carolina.
- 12-ton per day test of sludge containing short fiber rejects and plastics at the Inland Container plant in California.

Additionally, the technology developer has a test facility in Baltimore, Maryland, where over 5,000 hours of testing have been conducted. Part of those hours consisted of two pilot trials on Georgia-Pacific Big Island spent pulping liquor.

The first pilot test for Georgia-Pacific occurred in January of 1998 and consisted of 86 continuous hours of operation on the 20-lb/day unit. The 86 hours included 73 hours of pre-conditioning for the unit and fluidized bed and 13 hours of actual test period to generate the required performance data. Results of this initial test conclusively demonstrated the feasibility of this technology for the Big Island liquor. The test achieved a 91.6% carbon conversion rate, generating a product gas with a higher heating value (HHV) of 254 Btu per dscf. The product gas yield was 7,564 Btu per pound of Black Liquor Solids (BLS).

The second pilot test, conducted in January of 1999, consisted of a total of four weeks of steam-reforming tests. Two tests were conducted over this time, including a low bed temperature (~1080 degrees F) and a higher temperature (~ 1124 degrees F) test. The tests processed a total of 5,094 pounds of BLS. The pilot plant operated well over the four-week period, with steady temperature profiles and no evidence of agglomeration, de-fluidization, channeling or heater fouling. The tests achieved carbon conversion rates of 81.3% and 99% for the low temperature and higher temperature runs, respectively. Product gas heating value ranged from 279 to 253 Btu per dscf and product gas yields were 5,081 Btu per pound BLS at the low temperature and 7,191 at the high temperature. Results of this trial confirm the results of the 1998 trial and the additional information will aid the engineers in finalizing the design for the full-scale plant proposed for the Big Island facility.

G. Monitoring, Reporting, Accountability, and Evaluation Methods

Evaluation and monitoring of the gasification system will be a major effort as the equipment is brought on-line. Information concerning performance testing and compliance emission monitoring can be found in Section II.C.7 of this Agreement. Although it is unknown what details will be required, other reports regarding gasification system technology related to this project, that are produced for the Department of Energy will also be made available to the stakeholders and the public. The stakeholders will be notified of the availability of issued permits.

The potential reduction in greenhouse gasses is another aspect of the project that will be monitored. Greenhouse gasses have been implicated in causing global warming. The compounds most commonly associated with greenhouse gasses are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), sulfur hexafluoride (SF₆), perfluorocarbons, and hydrofluorocarbons. Of these, carbon dioxide is the gas most likely to be affected by the gasification process. Although the application of gasification technology at the Big Island Mill is not expected to have a dramatic effect on greenhouse gas emissions, some moderate reductions are anticipated. More importantly, the application of this technology to the industry as a whole, including the gasification of all biomass and implementation of combined cycle technology, is expected to yield very large reductions in greenhouse gasses. This is discussed in more detail in Section III.E.

The reductions in carbon dioxide anticipated from this project at Big Island will be a result of not burning auxiliary fuel to sustain black liquor combustion and because the project offsets approximately 50,000 lbs per hour of steam currently generated by another natural gas fired boiler. In order to document the future reduction of CO₂ and the increased efficiency of energy conversion, Georgia-Pacific must establish a baseline for current emissions and a reporting mechanism for future emissions. An estimation of the reduced CO₂ emissions from not burning auxiliary fuel will be documented. CO₂ data will be collected during normal operation of the gasification system. This can then be compared to baseline CO₂ data from the smelters. Increases in thermal efficiency can be ascertained by measuring the increase in steam output per unit fuel input in the chemical recovery process.

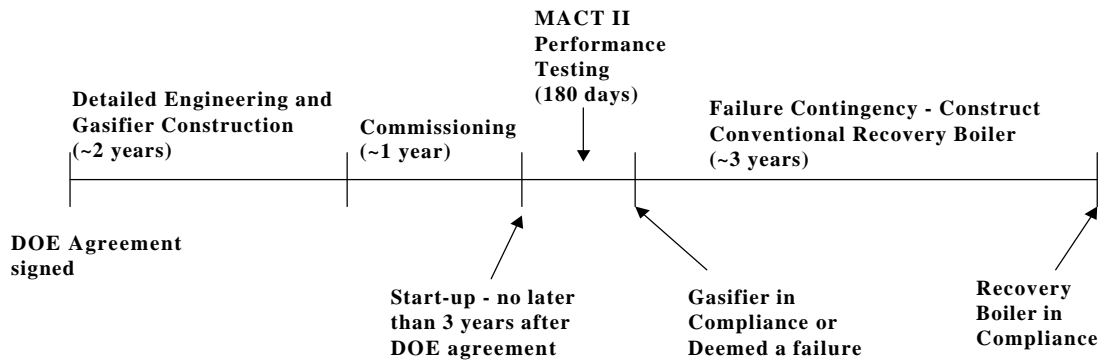
The VADEQ has responsibility to ensure that the new emission source is adequately monitored to maintain compliance with all applicable federal and state requirements. Monitoring requirements will be established by the VADEQ in the relevant permits. Any request for alternate monitoring parameters will need to be approved by the Administrator for MACT II.

H. Avoidance of Shifting the Risk Burden to Other Areas or Media

The emission reductions anticipated from this innovative process are believed to be true pollution reductions and not merely a movement of contaminants to another media. As indicated in the comparative emissions data in Tables 1 and 2 in Section III.A, the greatest reductions are in NO_x, SO₂, VOCs, CO and Particulates. The reduction in NO_x is a function of NO_x control technology in the gasification system boiler. Georgia-Pacific intends to utilize low-NO_x burners for both natural gas and product gas. VOCs are converted to energy and the particulates are captured and added to the bed solids as additional sodium carbonate. Some of the sulfur compounds could be purged to the Mill wastewater treatment system for assimilation. No significant impact to water quality is anticipated.

An area of concern is the potential risk of failure of the black liquor gasification system and the subsequent construction of a recovery boiler. During this construction period the smelters would be operated to maintain production at the Mill. This time period could very possibly run past the MACT II compliance date. There then is a risk that total emissions over the project period would exceed emissions if the project were not pursued and conventional technology was put into place by the compliance date. The following relative time line and data table will help clarify the project schedule and its potential effect on overall project emissions. Table 4 shows emissions in total tons for a set period of time during the project under four different scenarios.

Relative Project Time Line



**Table 4
Comparison of Different Project Scenarios**

Potential Total Project Emissions in tons from Jan.1, 2001 to March 01, 2007

Pollutant	Gasification Project Successful	Gasification Fails Replace w/Recovery Boiler Boiler Startup 2007	MACT II Final Dec. 2000 No Project XL Recovery Boiler Startup 2003	Recovery Boiler Startup 2005
NOx	402	828	759	869
SO2	30	66	71	75
CO	14461	34867	20389	30956
CO2	608812	632229	685370	665004
VOC	3127	7546	4334	6659
PM	770	2023	1203	1806

The first column shows the total emissions estimated if the gasification project is successful. The second column shows estimated emissions if the project fails and a recovery boiler is built, during which time the smelters would continue to operate. The third column is an estimate of the emissions if gasification technology is not pursued and the MACT II promulgation date occurs in December 2000. The fourth column of data shows total emissions if Georgia-Pacific does not pursue gasification technology and the smelters continue to operate until replaced by a recovery boiler in 2005. The conclusions which can be drawn from this data are as follows: 1) a successful gasification technology implementation has much lower tons of emissions than the other scenarios; 2) the worst case additional pollutant burden would be the difference between column 2 (failed project) and column 3 (earliest MACT II date w/o Project XL); and 3) the best case additional pollutant burden would be the difference between column 2 and column 4 (delayed replacement of the smelters with a recovery boiler). An early and a late smelter replacement date were selected and stated in Table 4 in order to describe the possible range in emissions and provide a comparison of the scenarios. In summary, the Parties agree that the potential additional pollutant burden in pursuing this project do not out-weigh the potential benefits.

Another area of concern is that of Environmental Justice (EJ). The two criteria reviewed to determine if the project area is an EJ area are, 1) Does the minority population in the area of concern exceed the State average for minority population?, and 2) Does the income level in the area of concern exceed the state average for

poverty?. The average minority population in Virginia is 27.09%, compared to a project area average minority population of 18.9%. The average percentage of population living at or below the poverty level in Virginia is 12.25%, compared to a project area poverty average of 5.0%. Both are well below state averages, therefore, this is not considered an Environmental Justice community.

IV. Description of the Requested Flexibility and Legal Implementing Mechanisms

A. Requested Flexibility

This XL Project requires regulatory flexibility for the chemical recovery system (including the existing smelters and the black liquor gasification system); and the flexibility to change the Mini-Mill (No. 4 Paper Machine complex and its ancillary equipment) permit in accordance with current regulations.

There are no current full-scale commercial applications of the black liquor Steam-Reforming gasification technology of the type proposed by Georgia-Pacific. Georgia-Pacific has identified two principal risks in attempting to construct and operate a gasification system. The first risk is that, once constructed, the gasification system will require an extended period of unforeseen problem resolution. During this commissioning period, the existing smelters must be available to process liquor to accommodate Georgia-Pacific's ongoing production demands. The Parties recognize that the existing smelters cannot meet the standard of performance expected to be promulgated under MACT II, and that the commissioning period for the gasification system may extend beyond the applicable MACT II compliance date for existing sources (once established).

The second risk is that the gasification system will fail (as defined in Project Element 9). In this case, Georgia-Pacific will construct a standard chemical recovery boiler in lieu of a gasification system to comply with MACT II, and will need to continue to operate the existing smelters, while the standard recovery boiler is constructed. Should either of these two situations occur, as part of this XL Project, Georgia-Pacific is requesting the flexibility to operate the existing smelters past the MACT II compliance date for existing sources (once established).

There are three VADEQ permit actions necessary to implement this XL project. The first is a permit to construct and operate the new chemical recovery system. The second is to permit a Kraft liquor trial and the third is to change the steam utilization set in the permit for the Mini-Mill. The change is requested to account for the new steam production expected from combustion of the gasification system product gas.

As a condition of receiving DOE funding for the gasification project, Georgia-Pacific has agreed to test a Kraft black liquor sample from a yet to be determined source. The details of this trial will be worked out at a later date; however, it is anticipated that the trial will take place after start-up and will not last more than a total of 500 hours, over the course 1500 hours. During these trials, Georgia-Pacific will need to operate the smelters to process the Mill's black liquor production.

Finally, Georgia-Pacific also has requested modification of certain steam utilization restrictions that were imposed in a permit issued by the VADEQ for the construction and operation of a mini-Mill at the Big Island facility. The restrictions stem from new source review (NSR) regulations issued by EPA under the Clean Air Act (CAA) which are implemented by VADEQ.

Details of these requested flexibilities are further discussed below.

B. Legal Implementing Mechanisms

To accommodate the requested flexibilities, and implement this XL project, the EPA will propose a rule for public comment. This rule will establish site-specific MACT II compliance date extensions, effective under certain circumstances, for the existing smelters at the Georgia-Pacific Big Island plant and the gasification system or conventional recovery boiler system; as well as a site-specific definition for the term “start-up” applicable to the gasification system.

VADEQ intends to incorporate the federal MACT II rule, including the site-specific provisions, into the State regulations and thus be granted delegation of this program from the EPA, per the April 20, 1998 delegation agreement.

Additionally, to accommodate the requested flexibilities and implement this XL project, VADEQ intends to propose and issue a permit to construct and operate a new chemical recovery system at Georgia-Pacific’s Big Island facility. Finally, VADEQ expects to: (1) modify the steam utilization requirements in the current permit for the mini-Mill, and (2) undertake an approval process, separate from the permit for the new chemical recovery system, to allow for the limited duration Kraft liquor trial.

Nothing in this Final Project Agreement has the effect of relieving Georgia-Pacific of its existing duty to comply with all permit and/or regulatory requirements which currently exist or which will be developed as a part of this XL project, except to the extent that they are specifically modified by the legal implementation mechanisms described in this Agreement. EPA and VADEQ reserve their right to enforce any applicable permit or regulatory requirements or standards during the XL project term.

1. Federal

Compliance Date Flexibility

The need for an extension of the MACT II compliance date (as described in Project Element 9) will depend on the occurrence of certain events and completion of certain actions:

a. Georgia-Pacific will undertake the installation and operation of a prototype, black-liquor steam-reforming gasification system. EPA will provide a later compliance date for the MACT II applicable to the Georgia-Pacific Big Island facility if either of the following events takes place and Georgia-Pacific provides timely notification to the other stakeholders:

- i. Georgia-Pacific experiences an unavoidable delay that is likely to prevent the gasification system from achieving startup by the promulgated MACT II compliance date for existing sources (applicable to the existing smelters), or
- ii. Georgia-Pacific determines at some point during the construction, commissioning, and/or startup of the new gasification system, that the system has failed (as described in Project Element 9), and the installation of a conventional recovery boiler system cannot be completed by the MACT II compliance date for existing sources (applicable to the existing smelters).

b. The new compliance date will be determined as follows:

i. If paragraph a.i above applies, the extended compliance date would be based on a period consistent with the amount of delay experienced in construction of the gasification system, or the time needed to effect modifications to the gasification system that will lead to start-up. EPA does not expect to extend the compliance date beyond 03/01/04 (presuming the promulgated MACT II compliance date precedes 03/01/04. If it does not precede 03/31/07, it is believed that flexibility will not be needed).

ii. If paragraph a.ii above applies, and Georgia-Pacific determines that the gasifier project has failed, the rule will provide Georgia-Pacific an extension to the MACT II compliance date of three years from the date of its notification of failure to EPA. This will allow Georgia Pacific to operate the existing smelters while a new conventional chemical recovery system is installed. EPA does not expect to extend the compliance date beyond 3/31/07.

c. EPA expects the site-specific MACT II rule to include information/reporting requirements and procedures for Georgia-Pacific to follow to obtain a compliance extension. These information/reporting requirements will define

the notice Georgia-Pacific must submit, as described in Project Element 9, to support the need for a compliance extension and any follow-up or progress reports necessary after such notification. Such support may include: evidence of good faith attempts to make the gasification system work, description of delays or operational problems experienced, and details of the plan to continue to pursue operation of the gasification system or details of the reasons for declaring failure of the project.

d. See also item 3, “Kraft Liquor Trials,” under this section.

2. State

While no regulatory flexibility will be required for this project by the State, the VADEQ intends to propose and issue a permit to construct and operate a chemical recovery system for the Georgia-Pacific Mill located in Big Island, Virginia. This permit will be issued under the authority of 9 VAC 5-80-10 of the Virginia Regulations for the Control and Abatement of Air Pollution. VADEQ expects this permit will include conditions derived from 9 VAC 5 Chapter 50 Article 5 (i.e., Virginia’s “New Source Performance Standards” (NSPS)) and from 9 VAC 5 Chapter 60 Article 2 (i.e., Virginia’s “National Emission Standards for Hazardous Air Pollutants for Source Categories” (commonly known as the MACT provisions)). Furthermore, VADEQ expects that this permit will include conditions to ensure that the permit for the new chemical recovery system is NOT subject to review under 9 VAC 5 Chapter 80 Article 8 (i.e., Virginia’s Prevention of Significant Deterioration (PSD) regulations), either during regular operation or during the Kraft liquor trial.

Georgia-Pacific also has requested modification of certain steam utilization restrictions that were imposed in a construction and operating permit previously issued by VADEQ for the Mini-Mill. The modification is requested to account for the new steam production expected from combustion of the gasification system product gas. Currently, the permit to construct and operate the Mini-Mill requires that the No.6 Power Boiler, which is fueled by natural gas, provide a portion of the steam to power the linerboard machine and secondary fiber equipment in the Mini-Mill. VADEQ expects to modify this permit to allow steam generated by the gasification system and associated steam-generating equipment to supply steam in place of the same amount of steam from the No. 6 boiler. Specifically, the gasification system-generated steam will be used to offset steam generated by higher cost natural gas. The associated cost savings are critical in G-P’s financial evaluation determining if it can proceed with the project. To accomplish this change, VADEQ intends to propose and issue a permit to change the construction permit for the Mini-Mill at the Georgia-Pacific Mill, under the authority of 9 VAC 5-80-10 (i.e., Permits – New and Modified

Stationary Sources) of the Virginia Regulations for the Control and Abatement of Air Pollution.

3. Kraft Liquor Trial

In addition to the regulatory flexibility contemplated above, the Parties recognize that Georgia-Pacific, as a condition of receiving DOE funding, intends to conduct a trial of the suitability of the gasification system for use with black liquor generated in Kraft pulp and paper Mills. Kraft black liquor is different from the type of black liquor used in semi-chemical pulp and paper Mills such as the Big Island facility. While the precise timing of the trial will be detailed at a later date, the parties anticipate that the trial will not last more than three weeks (500 operating hours) in total (see schedule). During the Kraft liquor trial phase, it will be necessary to operate the existing smelters to process the Mill's black liquor. EPA expects that the site-specific section of the MACT II will allow operation of the smelters during this period. The trial will be permitted by the VADEQ. The VADEQ construction permit will have record keeping and reporting requirements necessary to ensure that during this trial the smelters will operate in accordance with their pre-MACT II regulatory requirements. In no case will the smelter operations, during the Kraft liquor trial, exceed 1500 hours.

V. Discussion of Intentions and Commitments for Implementing the Project

A. Georgia-Pacific Corporation's Intentions and Commitments

Georgia-Pacific expects that ultimately it will be able to complete construction, commissioning and start-up of the gasifier system within a defined period of time, after which it expects that the system will comply with the MACT II requirements for new sources and that it will decommission the existing smelters.

B. EPA's and VADEQ's Intentions and Commitments

1. EPA intends to propose and issue (subject to applicable procedures and review of public comments) site-specific regulations within the MACT II rule (40 CFR part 63 subpart MM), to provide a compliance date extension for the Georgia-Pacific Big Island pulp and paper Mill for the situations described in Section IV.B of this FPA. Specifically, EPA intends to amend 40 CFR Sections 63.861, 63.863, and 63.867 (as presently proposed) to allow implementation of this gasification system project and to allow for various contingencies surrounding the project's success or failure. Appendix 4 contains a description of anticipated rule-making.
2. The VADEQ intends to propose and issue (subject to applicable procedures and review of public comments) a construction permit for the gasification system project under 9 VAC 5-80-10 incorporating all relevant applicable requirements for the SIP and a separate permit action to provide for the Kraft Liquor Trials. Furthermore, VADEQ intends to propose and issue (subject to applicable procedures and review of public comments) a change to the construction permit for the Mini-Mill under 9 VAC 5-80-10 incorporating all relevant applicable requirements for the SIP.

C. Proposed Schedule of Major Events and Milestones Performance Targets

See Appendix 2.

D. Project Tracking, Reporting and Evaluation

Quarterly reports will be generated and distributed to Stakeholders and other interested Parties. Evaluation of the project will be accomplished by reviewing performance and compliance data. This information will be available to all Stakeholders.

E. Periodic Review by the Parties to the Agreement

The Parties will hold periodic performance review conferences to assess progress in implementing this Project. Unless they agree otherwise, the date for those conferences will be concurrent with annual Stakeholder meetings. No later than thirty (30) days following a periodic performance review conference, Georgia-Pacific will provide a summary of the minutes of that conference to all Stakeholders. Any additional comments of participating Stakeholders will be reported to EPA.

F. Duration

This Agreement will remain in effect for eight years, unless the Project ends at an earlier date, as provided under Section VIII (Amendments or Modifications), Section XI (Withdrawal or Termination), or Section IX (Transfer of Project Benefits and Responsibilities). This Project will not extend past the agreed upon date, and Georgia-Pacific will comply with all applicable requirements following this date (as described in Section XII) unless all Parties agree to an amendment to the Project term (as provided in Section VII).

VI. Legal Basis for the Project

A. Authority to Enter into the Agreement

By signing this Agreement, EPA, VADEQ, the USDA Forest Service, and Georgia-Pacific acknowledge and agree that they have the respective authorities, discretion, and resources to enter into this Agreement and to implement all applicable provisions of this Project, as described in this Agreement.

B. Legal Effect of the Agreement

This Agreement states the intentions of the Parties with respect to Georgia-Pacific's XL Project. The Parties have stated their intentions seriously and in good faith, and expect to carry out their stated intentions.

This Agreement in itself does not create or modify legal rights or obligations, is not a contract or a regulatory action, such as a permit or a rule, and is not legally binding or enforceable against any Party. Rather, it expresses the plans and intentions of the Parties without making those plans and intentions binding requirements. This applies to the provisions of this Agreement that concern procedural as well as substantive matters. However, while the Parties fully intend to adhere to these procedures, they are not legally obligated to do so.

EPA intends to propose and issue (subject to applicable procedures and review of public comments) site specific regulations within the MACT II rule (40 CFR part 63 subpart MM) to provide compliance date extensions for the Georgia-Pacific Big Island Pulp and Paper Mill for the contingent situations described in Section IV.B of this FPA. The provisions for the rule EPA intends to prepare are outlined in Appendix 4. Any rules, permit modifications, or legal mechanisms that implement this Project will be effective and enforceable as provided under applicable law.

This Agreement is not a "final agency action" by EPA, because it does not in and of itself, create or modify legal rights or obligations and is not legally enforceable. This Agreement itself is not subject to judicial review or enforcement. Nothing any Party does or does not do that deviates from a provision of this Agreement, or that is alleged to deviate from a provision of this Agreement, can serve as the sole basis for any claim for damages, compensation or other relief against any Party.

C. Other Laws or Regulations that May Apply

Except as provided in the legal implementing mechanisms for this Project, the parties do not intend that this Agreement will modify any other existing or future laws or regulations.

D. Retention of Rights to Other Legal Remedies

Except as expressly provided in the legal implementing mechanisms described in Section IV and V, nothing in this Agreement affects or limits Georgia-Pacific's, EPA's, the VADEQ's, or the USDA Forest Service's legal rights. These rights include legal, equitable, civil, criminal or administrative claims or other relief regarding the enforcement of present or future applicable federal and state laws, rules, regulations or permits with respect to the facility.

Although Georgia-Pacific does not intend to challenge agency actions implementing the Project (including any rule amendments or adoptions, permit actions, or other action) that are consistent with this Agreement, Georgia-Pacific reserves any right it may have to appeal or otherwise challenge any EPA or Virginia action to implement the Project. With regard to the legal implementing mechanisms, nothing in this Agreement is intended to limit Georgia-Pacific's right to administrative or judicial appeal, or review of those legal mechanisms, in accordance with the applicable procedures for such review.

VII. Unavoidable Delay during Project Implementation

“Unavoidable delay” (for purposes of this Agreement) means any event beyond the control of any Party that causes delays or prevents the implementation of the Project described in this Agreement, despite the Parties’ best efforts to put their intentions into effect. An unavoidable delay can be caused by, for example, a fire or acts of war.

When any event occurs that may delay or prevent the implementation of this Project, whether or not it is avoidable, the Party to this Agreement who knows about it will immediately provide notice to the remaining Parties. Within thirty (30) days after that initial notice, the Party should confirm the event in writing. The confirming notice should include 1) the reason for the delay; 2) the anticipated duration; 3) all actions taken to prevent or minimize the delay; and 4) why the delay was considered unavoidable, accompanied by appropriate documentation.

If the Parties agree that the delay is unavoidable, relevant parts of the Project schedule (see Appendix 2) will be extended to cover the time period lost due to the delay. Such agreements will be documented in a written amendment to this Agreement. If the Parties don’t agree that the delay is unavoidable, then they will follow the provisions for Dispute Resolution outlined below.

This section applies only to provisions of this Agreement that are not implemented by legal implementing mechanisms. Legal mechanisms, such as permit provisions or rules, will be subject to modification or enforcement as provided under applicable law.

VIII. Amendments or Modifications to the Agreement

This Project is an experiment designed to test new approaches to environmental protection and there is a degree of uncertainty regarding the environmental benefits and costs associated with activities to be undertaken in this Project. Therefore, it may be appropriate to amend this Agreement at some point during its duration.

This Final Project Agreement may be amended by mutual agreement of all parties at any time during the duration of the Project. The parties recognize that amendments to this Agreement may also necessitate modification of legal implementation mechanisms (*such as a rule or permit*) or may require development of new implementation mechanisms. If the Agreement is amended, EPA, VADEQ, the USDA Forest Service, and Georgia-Pacific expect to work together with other regulatory bodies and stakeholders to identify and pursue any necessary modifications or additions to the implementation mechanisms in accordance with applicable procedures. If the Parties agree to make a substantial amendment to this Agreement, the general public will receive notice of the amendment and be given an opportunity to participate in the process, as appropriate.

In determining whether to amend the Agreement, the parties will evaluate whether the proposed amendment meets Project XL acceptance criteria and any other relevant considerations agreed on by the parties. All parties to the Agreement will meet within ninety (90) days following submission of any amendment proposal (or within a shorter or longer period if all parties agree) to discuss evaluation of the proposed amendment. If all Parties support the proposed amendment, the Parties will (after appropriate stakeholder involvement) amend the Agreement.

IX. Transfer of Project Benefits and Responsibilities to a New Owner

The Parties expect that the implementing mechanisms will allow for a transfer of Georgia-Pacific's benefits and responsibilities under the Project to any future owner or operator upon request of Georgia-Pacific and the new owner or operator, provided that the following conditions are met:

- A.** Georgia-Pacific will provide written notice of any such proposed transfer to the EPA, VADEQ and other signatories at least ninety (90) days before the effective date of the transfer. The notice is expected to include identification of the proposed new owner or operator, a description of its financial and technical capability to assume the obligations associated with the Project, and a statement of the new owner or operator's intention to take over the responsibilities in the XL Project of the existing owner or operator.
- B.** Within forty-five (45) days of receipt of the written notice, the Parties expect that EPA and VADEQ, after consultation with other stakeholders, will determine whether: 1) the new owner or operator has demonstrated adequate capability to meet EPA's requirements for carrying out the XL Project; 2) is willing to take over the responsibilities in the XL Project of the existing owner or operator; and 3) is otherwise an appropriate Project XL partner.

It will be necessary to modify the Agreement to reflect the new owner and it may also be necessary for EPA and VADEQ to amend appropriate rules, permits, or other implementing mechanisms (subject to applicable public notice and comment) to transfer the legal rights and obligations of Georgia-Pacific under this Project to the proposed new owner or operator.

X. Process for Resolving Disputes

Any dispute, which arises under, or with respect to this Agreement, will be subject to informal negotiations between the Parties to the Agreement. The period of informal negotiations will not exceed twenty (20) calendar days from the time the dispute is first documented, unless that period is extended by a written agreement of the Parties to the dispute. The dispute will be considered documented when one party sends a written Notice of Dispute to the other Parties.

If the Parties cannot resolve a dispute through informal negotiations, the Parties may invoke non-binding mediation by describing the dispute with a proposal for resolution in a letter to the Regional Administrator for EPA Region 3. The Regional Administrator will serve as the non-binding mediator and may request an informal mediation meeting to attempt to resolve the dispute. He or she will then issue a written opinion that will be non-binding and does not constitute a final EPA action. If this effort is not successful, the Parties still have the option to terminate or withdraw from the Agreement, as set forth in Section XI below.

XI. Withdrawal From or Termination of the Agreement

A. Expectations

Although this Agreement is not legally binding and any party may withdraw from the Agreement at any time, it is the desire of the Parties that it should remain in effect through the expected eight year duration of the project (as stated in section V.G.), and be implemented as fully as possible unless one of the conditions below occurs:

1. Failure by any party to: (a) comply with the provisions of the enforceable implementing mechanisms for this Project, or (b) act in accordance with the provisions of this Agreement. The assessment of the failure will take its nature and duration into account.
2. Failure of any party to disclose material facts during development of the Agreement.
3. Failure of the Project to provide superior environmental performance consistent with the provisions of this Agreement.
4. Enactment or promulgation of any environmental, health or safety law or regulation after execution of the Agreement, which renders the Project legally, technically or economically impracticable.
5. Decision by an agency to reject the transfer of the Project to a new owner or operator of the facility.

In addition, EPA, the USDA Forest Service, and VADEQ do not intend to withdraw from the Agreement if Georgia-Pacific does not act in accordance with this Agreement or its implementation mechanisms, unless the actions constitute a substantial failure to act consistently with intentions expressed in this Agreement and its implementing mechanisms. The decision to withdraw will, of course, take the failure's nature and duration into account.

Georgia-Pacific will be given notice and a reasonable opportunity to remedy any "substantial failure" before EPA's withdrawal. If there is a disagreement between the Parties over whether a "substantial failure" exists, the Parties will use the dispute resolution mechanism identified in section X of this Agreement. EPA, VADEQ, and the USDA Forest Service retain their discretion to use existing enforcement authorities, including withdrawal or termination of this Project, as appropriate. Georgia-Pacific retains any existing rights or abilities to defend itself against any enforcement actions, in accordance with applicable procedures.

B. Procedures

The Parties agree that the following procedures will be used to withdraw from or terminate the Project before expiration of the Project term. They also agree that the implementing mechanism(s) will provide for withdrawal or termination consistent with these procedures.

1. Any party that wants to terminate or withdraw from the Project is expected to provide written notice to the other Parties at least sixty (60) days before the withdrawal or termination.
2. If requested by any party during the sixty- (60) day period noted above, the dispute resolution proceedings described in this Agreement may be initiated to resolve any dispute relating to the intended withdrawal or termination. If, following any dispute resolution or informal discussion, a party still desires to withdraw or terminate, that party will provide written notice of final withdrawal or termination to the other Parties.

If any agency withdraws or terminates its participation in the Agreement, the remaining agencies will consult with Georgia-Pacific to determine whether the Agreement should be continued in a modified form, consistent with applicable federal or State law, or whether it should be terminated.

3. The procedures described in this Section apply only to the decision to withdraw or terminate participation in this Agreement. Procedures to be used in modifying or rescinding any legal implementing mechanisms will be governed by the terms of those legal mechanisms and applicable law. It may be necessary to invoke the implementing mechanism's provisions that end authorization for the Project (called "sunset provisions") in the event of withdrawal or termination.

XII. Compliance After the Project is Over

The Parties intend that there be an orderly return to compliance upon completion, withdrawal from, or termination of the Project, as follows:

A. Regulatory Compliance at the Conclusion of the Project

See the regulatory flexibility description in Section IV of this Agreement.

B. Early Withdrawal or Termination

In the event of a withdrawal or termination not based on the end of the Project term and where Georgia-Pacific has made efforts in good faith, the Parties to the Agreement will determine an interim compliance period to provide sufficient time for Georgia-Pacific to return to compliance with any regulations deferred under the Project. The interim compliance period will extend from the date on which EPA and VADEQ provides written notice of final withdrawal or termination of the Project, in accordance with Section XI of this Project Agreement. By the end of the interim compliance period, Georgia-Pacific will comply with the applicable deferred standards as described in Section IV of this Agreement. During the interim compliance period, EPA and/or VADEQ may issue an order, permit, or other legally enforceable mechanism establishing a schedule for Georgia-Pacific to return to compliance with otherwise applicable regulations as soon as practicable. This schedule cannot extend beyond three years from the date of withdrawal or termination. Georgia-Pacific intends to be in compliance with all applicable Federal, State, and local requirements as soon as it is practicable, as will be set forth in the new schedule.

XIII. Signatories and Effective Date

Effective this day, Wednesday, May 31, 2000.

Patrick J. Purdy, General Manager, Georgia-Pacific Big Island Operations

Dennis H. Treacy, Director, Virginia Department of Environmental Quality

Bradley M. Campbell, Regional Administrator, US Environmental Protection Agency,
Region III

William E. Damon, Jr., Forest Supervisor, George Washington and Jefferson National
Forests

Appendix 1: Glossary of Terms

BACT – Best Available Control Technology

Black Liquor - Spent pulping liquor; Pulping chemicals with organics cooked out of wood chips

Black Liquor Solids (BLS)- Used cooking liquor after the water has been evaporated

Clean Air Act (CAA) – Federal regulations generally addressing air pollution issues

Commissioning – The period of time between construction and Start-up

Construction Permit – VADEQ Air permit allowing construction of a facility and outlining compliance limits

Containerboard – material used to make containerboard boxes (cardboard)

Cooking Liquor – The chemicals used to cook (pulp) wood chips. In the case of Big Island these chemicals are sodium carbonate and sodium hydroxide.

Corrugating Medium – Paper used to make the fluted inner layer of containerboard (cardboard)

Criteria Pollutants – Any pollutant for which an ambient air quality standard is established (e.g., Particulate matter, Sulfur dioxide, Carbon monoxide, Ozone, and Nitrogen dioxide)

DOE – U.S. Department of Energy

EPA – U.S. Environmental Protection Agency

Fourier Transform Infrared Spectroscopy (FTIR) – Analytical method for identifying and quantifying hazardous air pollutants

Furnish – The raw materials (fiber, pulp) used to make paper

FPA – Final Project Agreement

Gasification - Converting organics into a combustible gas through heat input

Green Liquor - Pulping chemicals after removal of the organics and inert material

HAPs – Hazardous Air Pollutants as defined in CAA 122 B

Higher Heating Value (HHV) – A term used to quantify the amount of heat generated by combustion of a specific fuel

Appendix 1 (continued)

Kraft Black Liquor – Black liquor generated using a sodium sulfate/sodium hydroxide cooking liquor

Linerboard – Paper used to make the inner and outer layer of containerboard

MACT - Maximum Achievable Control Technology - Federal Air Regulations for HAPs

MACT II – Proposed federal regulations (April 15,1998) 40 CFR Part 63 Subpart MM addressing HAPs from Pulp and Paper Mill Chemical Recovery systems

Medium Machine – Paper machine that makes corrugating medium

Mini-Mill - a manufacturing complex at G-P Big Island originally permitted for construction and operation by VADEQ on 12/27/94. The 1994 permit was modified on 6/30/95. This complex produces linerboard from OCC. The natural gas fired Power Boiler No. 6 has been considered part of the Mini-Mill complex since the original permit.

NEPA – National Environmental Policy Act

NO_x – Nitrogen oxides

Old Corrugated Container (OCC) – Post-consumer waste containerboard

Particulates (PM, PM₁₀) – Particulate matter or particulate matter less than 10 microns in size.

PSD – Prevention of Significant Deterioration

Secondary Fiber – Pulp made from post-consumer waste paper

Smelter – A technology used to combust the organics from pulp cooking liquor

SO₂ – Sulfur dioxide

Start-up – The day Commissioning ends. This also triggers the 180-day performance testing period

Steam-Reforming Gasification - Using indirect heat and steam to drive the gasification process

Total Reduced Sulfur (TRS) – Emissions of sulfur in a chemically reduced state (i.e.: hydrogen sulfide, methyl mercaptan, etc.)

VADEQ – Virginia Department of Environmental Quality

Appendix 1 (continued)

VOCs – Volatile Organic Compounds

XL – eXcellence in Leadership

Appendix 2: Schedule and Milestones

	<u>Start</u>	<u>Completion</u>
1. Negotiation of Project XL FPA	02/18/99	05/03/00
2. DOE Solicitation and Contract	01/04/00	06/15/00
3. Project XL FPA signing time frame	05/31/00	07/03/00
4. VADEQ Construction Permit review	01/21/00	06/01/00
5. Project XL Federal Register/ EPA Response to Public Comment	05/08/00	07/30/00
6. Detailed Engineering	05/01/00	12/30/00
7. Procurement of Major Equipment	08/01/00	12/30/00
8. Purchase Remaining Equip. and Mat'l.	08/01/00	02/28/01
9. MACT II Promulgation		12/15/00
10. Project XL Stakeholder Update meeting	02/20/01	02/25/00
11. Select Construction Contractors	03/01/01	02/28/02
12. Construction/ Equipment Installation	09/01/01	08/30/02
13. Project XL Stakeholder Update meeting	02/18/02	02/22/02
14. Commissioning/Modifications/Training	08/01/02	09/01/03
15. DOE Demonstration and Final Report	02/01/03	05/30/05
16. Project XL Stakeholder Update	02/17/03	02/21/03
17. Gasification system Start-up (latest)		09/01/03
18. MACT II Performance Testing	09/01/03	03/01/04
19. Kraft Liquor Trial (~ 500 hours)	09/01/03	05/01/04
20. Project XL Stakeholder Update meeting	02/16/04	02/21/04
21. Final success/failure decision date for the Gasification System*		03/01/04
22. Modify State Const/Operating Air Permit	02/28/04	05/30/05
23. Decommission Existing Smelters*		05/01/04*
24. Final EPA Project XL Stakeholder Update		09/30/04
25. Estimated latest MACT II compliance date		03/01/07

* No later than 6 months after Start-up, G-P will determine whether the project is successful or must be replaced with alternative technology. If the project is deemed a failure, a three-year period to install conventional recovery boiler technology will be started at this time, and de-commissioning of the existing smelters will occur not later than 03/01/07.

Description of the Schedule Activities

1. Negotiation of Project XL FPA: Completion of the Project XL FPA is not critical unless it extends beyond the DOE's NEPA review. The Parties hope that negotiations on the FPA will be completed and published in the Federal Register for comment before that time so that it will have a positive influence on the NEPA review.
2. DOE Solicitation and Cooperative Agreement: G-P prepares a proposal responding to DOE's solicitation for projects to develop and demonstrate Black Liquor/Biomass Gasification in the Forest Products Industry (DE-PS26-00NT40772). G-P's proposal will include a project description, cost-benefit, how it will be built, how it will be tested, and how the technology will be commercialized in the future. If DOE selects the project for funding, a NEPA review will be conducted. This is a process where the funding agency conducts an analysis of the potential environmental and public consequences that could result from the project.

G-P completed the proposal and submitted it to DOE by 2/29/00. DOE anticipates that selections of the winning proposals will be announced in May and that cooperative agreements will be negotiated and awarded within the following 90 days, although the length of time required to finalize an agreement depends on the complexity of the negotiation process.

Following the selection announcement, DOE will initiate the NEPA review and begin negotiation of the agreement. During the negotiation period, DOE can authorize an organization to perform agreed-on work prior to completing actual award of an agreement, and DOE would subsequently reimburse the organization for these allowable costs, up to the amount of DOE's cost-share, after the agreement is awarded. However, until the NEPA review is completed, DOE cannot authorize use of funds for construction or other activities that would have an adverse environmental impact or limit DOE's choice of reasonable alternatives.

DOE's anticipated schedule for completing awards within 90 days following selection (i.e., before the end of June 2000) will not affect G-P's critical date of 8/1/00 for starting procurement of major equipment. An award can be made prior to completing the NEPA review. The length of time that DOE will require for completing the NEPA review, however, is uncertain and can vary considerably depending on the complexity and controversy of the activity being reviewed. While the Project XL stakeholder process conducted by G-P, and the Federal Register/public comment step used by EPA as part of the FPA process, should aid and be a positive influence on DOE's NEPA review, a review time extending more than about 4 months from the target date for selection of winning proposals will have a critical impact on schedules for installing the black liquor gasification technology.

Appendix 2 (continued)

3. Project XL FPA signing time frame: The Project XL FPA will be signed by the Stakeholder signatories after the close of the public comment period and addressing any necessary response to comments.
4. DEQ Construction Permit review: The permit schedule does not become critical unless it extends beyond the contract date.
5. Project XL Federal Register/Public Comment/EPA Response: The notice of availability of the final FPA will be published in the Federal Register, with any EPA response to comments as appropriate. It is hoped that these dates are not critical, as negative comments are not expected due to the nature of the XL process, particularly the involvement of stakeholders.
6. Detailed Engineering: The actual design of the project is done during this phase. This includes specifying the equipment required, designing the foundations, piping, electrical, building steel and instrumentation required. The start of detailed engineering is a critical date. Georgia-Pacific should be able to meet this date if 'pre-contract costs' are approved.
7. Procurement of Major Equipment: During this activity, the major pieces of process equipment are purchased. This must occur early, due to the length of time required to design many components and to custom build them. The start of procurement is critical. Before this starts, items 1, 2, & 3, above, must be completed. This drives the rest of the project schedule. If this is delayed, it may be possible to compress the schedule by paying a premium for expedited delivery of critical portions of the equipment.
8. Purchase Remaining Equipment and Material: During this activity all of the generic equipment such as pumps and motors are purchased. Also, piping, electrical and instrument materials are ordered. This is not a time critical activity.
9. MACT II Promulgation: Compliance required upon final promulgation for new sources and three years after promulgation for existing sources.
10. Project XL Stakeholder Update: Stakeholders are briefed on project progress.
11. Select Construction Contractors: During this phase, the engineering information from items 6 and 7 above, is used to obtain bids and select a construction contractor. From this point forward, the contractor helps to determine the best ways to build the project. This is not a time critical activity.
12. Construction/ Equipment Installation: The period when the project is under construction.

Appendix 2 (continued)

13. Project XL Stakeholder Update: Second XL Stakeholder briefing.
14. Commissioning/Modification/Training: Due to the innovative nature of the technology and the fact that the equipment has never been operated on a commercial scale, this FPA includes a schedule that will permit the adjustment or modification of parts of the process or equipment to ensure their proper functioning. During this time, operators, engineers and maintenance personnel will learn how to operate the equipment more efficiently. During the commissioning period each part of the chemical recovery system will be checked to ensure it is complete, installed properly, and operational. After individual parts are checked, the entire system will be operated for a period of time to ensure it is functioning properly. Commissioning will culminate with the successful completion of the gasification technology supplier's performance warranty demonstration. This demonstration comprises a series of trials to prove the technology and equipment are capable of performing to the contractual levels, required prior to release of final payment to the supplier.
15. DOE Demonstration and Final Report: During this period, the process will be operated normally as it will in the future. The equipment and process will be monitored to determine if there is any long-term problem that needs to be addressed. Examples of items to be checked include the corrosion and wear rates of the equipment, whether the process is reliable and stable, and if there are any maintenance or operations problems.
16. Project XL Stakeholder Update: Third Stakeholder briefing.
17. Start-Up: For this innovative XL project, start-up of the gasifier system will occur at the end of the commissioning phase and in any event no later than three years following the execution of the Department of Energy Cooperative Funding Agreement for this project. For the purposes of this FPA, the term "start-up" refers to the gasifier system unless otherwise noted. This start-up date will trigger the 180-day period for performance testing as required by the site-specific MACT II.
18. MACT II Performance Testing: The environmental testing required by the EPA will be complete by this time. Mill "start-up" triggers obligation for compliance testing period.
19. Kraft Liquor Trial: After the plant is running well on Big Island black liquor, Georgia-Pacific will try to run the system on liquor from a Kraft Mill. This is required to determine how this technology can be applied to other facilities. This is part of the commercialization plan with DOE to make the technology benefits available to more users. Please see section II.B.5 for more information regarding the Kraft black liquor trials.
20. Project XL Stakeholder Update: Fourth Stakeholder briefing.

Appendix 2 (continued)

21. Final Success/Failure Decision Date for the Gasification System: Last date to make a decision on success or failure of the gasification system.
22. Modify State Construction/Operating Permit: Based on the results of Emission-Limit Reducing Testing performed over a period of time, the permit limits will be adjusted, reflecting new limits for the gasification system.
23. Decommission Existing Smelters: After the gasification system is proven and reliable, the smelters will be physically isolated from the process and removed. If the gasification system fails the smelters will operate during conventional recovery system start-up.
24. Final EPA Project XL Stakeholder Update: The final report to DOE detailing all the events of the project along with documentation of the benefits predicted and achieved as well as problems and flaws will be prepared and provided to all participants.
25. Estimated Latest MACT II Compliance Date: If the gasification system fails, this would be the last date that the Georgia-Pacific Big Island Mill would be allowed to operate its existing smelters, as necessary, past the MACT II compliance date while it constructs a conventional recovery boiler.

Appendix 3: Stakeholders and Interested Parties

Stakeholder

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James Watson
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Big Island, VA 24526

Libraries

Big Island Public Library, Bedford County
1111 Schooldays Road
Big Island, VA 24526
804/299-5604

Amherst Public Library
Main Branch
P.O. Box 370
Amherst, VA 24521
804/946-9388

Appendix 4

Outline of Changes to MACT II Proposal to Accommodate the Georgia-Pacific XL Project

Below is an outline of the modifications EPA intends to make to the existing MACT II proposal to provide the flexibility G-P needs to undertake this XL Project. The actions in the “Compliance Extensions” section of the outline are described in greater detail on the two pages following the outline.

I. Definitions

A. Add a definition to Section 63.861 of the proposed rule for “startup,” to establish for the new gasification unit the point in time that it must be in compliance with the MACT II standard. The definition will be based on the successful completion of commissioning which will explain the process of bringing the new black liquor gasification system on-line and will apply only to the Big Island facility.

II. Compliance Extensions

A. Modify Section 63.863 of the proposed rule as follows:

1. Modify 63.863(a) to read: “The owner or operator of an existing affected source shall comply with the requirements in this subpart no later than [insert date 3 years after the effective date of the final rule], *except as specified in paragraph (c) of this section.*”
2. Add paragraph (c) to Section 63.863 to specify the types of possible compliance extensions for the Big Island facility’s existing smelters. (See next page for more detail on this paragraph).
3. Add three subparagraphs to Section 63.867(a) - Notifications - to describe the notices G-P must provide to appropriately document the need for any of the compliance extensions from 63.863(c). (See next page for more detail on this paragraph).

III. Record Keeping Requirement

Add subparagraph (c)(7) to Section 63.866 – Record Keeping Requirements – a new provision requiring that G-P keep records of the hours the smelters operate during the Kraft liquor trials.

**Expected Content of MACT II Rule Changes
for the Georgia-Pacific XL Project**
[Note: This is not actual rule language, but rather a description
of the expected content of future MACT II rule changes
to allow for the implementation of this XL Project]

Add to Section 63.863 - Compliance Dates

(c) Georgia-Pacific must make sure that the two existing semi-chemical combustion units (i.e., smelters) at the Big Island facility comply with this MACT II rule no later than _____ [three years after MACT II is promulgated], except as provided in paragraphs (c)(1) through (c)(3) below.

(1) If Georgia-Pacific constructs a new black liquor gasification system to replace the existing smelters at Big Island (as further described in the XL Project Final Project Agreement), and the gasification system will not achieve startup by the compliance date for existing affected sources (three years after this MACT II rule is promulgated), then the MACT II compliance date for the existing smelters will be when the new gasification system achieves startup or March 1, 2004, whichever occurs first. (As stated in proposed Section 63.867(a)(2)(i) of the MACT II, Georgia-Pacific must notify the EPA Administrator that startup of the new gasification system will occur after the compliance date for existing affected sources [three years after this MACT II rule is promulgated]).

(2) If Georgia-Pacific determines that its attempt to construct and startup a new black liquor gasification system at Big Island, Virginia, is not successful, and Georgia-Pacific must construct another type of semi-chemical combustion unit to replace the existing smelters, then the MACT II compliance date for the existing smelters will be three years after Georgia-Pacific declares the gasification system unsuccessful, or upon startup of the new, replacement semi-chemical combustion unit(s), or March 1, 2007, whichever occurs first.. (As stated in proposed Section 63.867(a)(2)(ii), Georgia-Pacific must notify the EPA Administrator at the time the gasification system is declared a failure.)

(3) After the compliance date for existing sources [three years after this MACT II rule is promulgated] and if Georgia-Pacific constructs and successfully starts-up a new black liquor gasification system to replace the existing smelters, the existing smelters at Georgia-Pacific's Big Island facility may be operated without complying with this MACT II rule for a period that will allow 500 hours of Kraft liquor trials, but in no case will smelter operations during the Kraft liquor trial exceed 1500 hours, and only while Georgia-Pacific conducts a trial of the new gasification system using black liquor imported from, a Kraft pulp Mill.. (Georgia-Pacific must submit the notice as required in proposed Section 63.867(a)(2)(iii) to activate this compliance extension.)

Add to Section 63.867 - Reporting Requirements

(a)(2) Notifications specific to Georgia-Pacific. For the compliance extensions described in Section 63.863(c)(1), (c)(2), or (c)(3), Georgia-Pacific must submit the following notices to the Administrator.

(i) For a compliance extension under proposed Section 63.863(c)(1), submit a notice that includes: an expected date for startup of the new black liquor gasification system and a description of the events that delayed the startup. The notice must be submitted prior to the compliance date for existing sources.

(ii) For a compliance extension under Section 63.863(c)(2), submit a notice that states: the date of Georgia-Pacific's determination that the black liquor gasification system is not successful and the reasons why the technology was not successful. The notice must be submitted within 15 working days of Georgia-Pacific's determination.

(iii) For a compliance extension under Section 63.863(c)(3), submit a notice that includes: a statement that Georgia-Pacific intends to run the Kraft black liquor trial(s), identifies the period in which the trial will take place, and why the trial cannot be run prior to the compliance date for existing affected sources. The notice must be submitted at least 10 working days before the start of the Kraft black liquor trial.

Section 63.861 Definitions

Start-up means, for the purpose of the Georgia-Pacific Big Island, VA black liquor gasification project, that notwithstanding the definition of "start-up" in 40 CFR Section 63.2, start-up will occur at the end of the commissioning phase or three years following the execution of the US Department of Energy Cooperative Funding Agreement for the prototype gasifier, whichever is earlier. (Commissioning means, for the purpose of the Georgia-Pacific Big Island, VA black liquor gasification project, that period of time during which each part of this new type of chemical recovery system will be checked and operated on its own to make sure it is complete and is installed properly. Commissioning will conclude with the successful completion of the gasifier technology supplier's performance warranty demonstration proving the technology and equipment are performing to the contractual levels and is ready to be placed in active service.)