

## **Statement of Basis**

**Permit to Construct No. P-2012.0034  
Project ID 61335**

**Idaho Forest Group LLC  
Riley Creek-Moyie Springs  
Moyie Springs, Idaho**

**Facility ID 021-00001**

**Final**

**July 7, 2014  
Harbi Elshafei HE,  
Permit Writer**

The purpose of this Statement of Basis is to satisfy the requirements of IDAPA 58.01.01. et seq, Rules for the Control of Air Pollution in Idaho, for issuing air permits.

<b>ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE.....</b>	<b>3</b>
<b>FACILITY INFORMATION.....</b>	<b>4</b>
Description .....	4
Permitting History .....	4
Application Scope .....	4
Application Chronology .....	5
<b>TECHNICAL ANALYSIS.....</b>	<b>5</b>
Emissions Units and Control Equipment .....	5
Emissions Inventories .....	6
Ambient Air Quality Impact Analyses.....	7
<b>REGULATORY ANALYSIS .....</b>	<b>8</b>
Attainment Designation (40 CFR 81.313) .....	8
Facility Classification.....	8
PSD Classification (40 CFR 52.21) .....	8
Permit to Construct (IDAPA 58.01.01.201).....	9
Tier II Operating Permit (IDAPA 58.01.01.401).....	9
MACT Applicability (40 CFR 63).....	9
NSPS Applicability (40 CFR 60).....	10
Other Rules as Applicable.....	10
Permit Conditions Review .....	10
“Incorporation of Federal Requirements by Reference.....	10
<b>PUBLIC REVIEW.....</b>	<b>12</b>
Public Comment Opportunity .....	12
<b>APPENDIX B – PROCESSING FEE .....</b>	<b>24</b>

## ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE

acfm	actual cubic feet per minute
AFS	AIRS Facility Subsystem
AIRS	Aerometric Information Retrieval System
BACT	Best Available Control Technology
BF/yr	Board feet per year
CAA	Clean Air Act
CFR	Code of Federal Regulations
CO	carbon monoxide
DEQ	Department of Environmental Quality
gr	grain (1 lb = 7,000 grains)
dscf	dry standard cubic feet
EFB	Electrified Filter Bed
EPA	U.S. Environmental Protection Agency
GHG	greenhouse gases
HAP	hazardous air pollutants
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
lb/hr	pounds per hour
MACT	Maximum Achievable Control Technology
MMBtu	million British thermal units
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO <sub>x</sub>	nitrogen oxides
NSPS	New Source Performance Standards
PC	permit condition
PM	particulate matter
PM <sub>10</sub>	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
PSD	Prevention of Significant Deterioration
PTC	permit to construct
PTE	potential to emit
Rules	Rules for the Control of Air Pollution in Idaho
scf	standard cubic feet
SIP	State Implementation Plan
SO <sub>2</sub>	sulfur dioxide
T2 OP/PTC	Tier II Operating Permit and Permit to Construct
TAP	toxic air pollutant
Tier I	Tier I operating permit
T/yr	tons per year
VOC	volatile organic compound

## **FACILITY INFORMATION**

### ***Description***

Logs are delivered by truck to Idaho Forest Group, LLC (IFG), unloaded, and stored in the log yard. The logs are then transported from the log yard by truck and loaded into the log deck by a dedicated crane. At the log deck, an infeeder sends the logs to one of two debarkers, which are the first step in the manufacturing process. Debarked logs are then trimmed to a desired length and transferred to the studmill. Sawing operations within the studmill reduce logs to the desired dimensions, and the lumber is then transferred to one of four kilns to be dried. After drying, the lumber is transferred to one of the planers which then surfaces the lumber to final dimensions and trimmed to a marketable length. Lumber is then graded, waxed or inked, stacked, and banded. Finished lumber is shipped off-site, primarily by rail and also by truck.

Emissions sources at the facility include a wood-fired boiler with a rated capacity of 80,000 pounds steam per hour, four drying kilns, two planer mills, and traffic on unpaved roads.

### ***Permitting History***

The following information was derived from a review of the permit files available to DEQ. Permit status is noted as active and in effect (A) or superseded (S).

- December 5, 2012 PTC No. P-2012.0034 Proj No. 61070. This permit revised T2-050113, issued August 31, 2009 by limiting the HAP emissions from the facility to below major source thresholds; increased the VOC emissions rate limits for the lumber drying kilns; and added specific VOC monitoring requirements for the kilns, (A, but will become S upon issuance of this permit )
- August 31, 2009 PTC/T2 No. T2-050113, this permit is issued to the facility to fulfill the requirements of the compliance schedule contained in the facility's Tier I operating permit, issued October 29, 2002, and modified on March 7, 2005, (S)
- August 18, 2003 PTC No. P-030119, sawmill equipment modification (re-issuance). This PTC was issued to Louisiana-Pacific Corporation. The company requested that PTC No. 021-00001, issued on July 23, 2001, be reissued because modification of the facility had not yet commenced and the July 23, 2001 PTC was due to expire, (A)
- July 23, 2001 PTC No. 021-00001, sawmill equipment modification. This PTC was issued to Louisiana-Pacific Corporation, (S)

### ***Application Scope***

This permitting action is to convert the Tier II Operating Permit and Permit to Construct (T2 OP/PTC) No. P-2012.0034 Proj No. 61070 to a stand-alone PTC at an existing Tier I facility.

## Application Chronology

February 28, 2014	DEQ received an application and an application fee.
March 26, 2014	DEQ determined that the application was incomplete.
April 2, 2014	DEQ received supplemental information from the applicant.
April 2, 2014	DEQ determined that the application was complete.
May 27, 2014	DEQ made available the draft permit and statement of basis for peer and regional office review.
June 6, 2014	DEQ made available the draft permit and statement of basis for applicant review.
June 26, 2014	DEQ received the permit processing fee.
July 8, 2014	DEQ issued the PTC to IFG.

## TECHNICAL ANALYSIS

### Emissions Units and Control Equipment

Table 1 EMISSIONS UNIT AND CONTROL EQUIPMENT INFORMATION

Emission Unit /ID No.	Emissions Unit Description	Control Device Description	Emissions Discharge Point ID No. and/or Description
Hog fuel boiler	<u>Hog fuel boiler:</u> Manufacturer: Kipper and Sons Burner type: stoker-fired unit Maximum capacity: 80,000 pounds steam per hour or 128 MMBtu/hr.	<u>Multiclone:</u> Manufacturer: Joy Manufacturing <u>Electrified Filter Bed (EFB):</u> Manufacturer: EFB, Inc. Model No.: FDC 50 particulate control system Maximum flow rate: 50,000 acfm  Disengagement stack baghouse Manufacturer: NA Control efficiency (PM <sub>10</sub> ): 99.8%	<u>EFB stack:</u> Height above ground: 80 feet (ft) Exit velocity: 35.7 ft/sec Exit temperature: 298 °F Stack diameter: 3.45 ft  <u>Disengagement baghouse stack:</u> Height above ground: 80 ft Exit velocity: 89.2 ft/sec Exit temperature: 92 °F Stack diameter: 1.0 ft
Dry kilns – four total	<u>Dry Kilns:</u> Kilns 1-3 were manufactured by Moore; kiln No. 4 was manufactured by Coe.	None	None 32 Vents from four kilns. Height above ground: 26 ft Exit velocity: 4.92 ft/sec Exit temperature: 229.7 °F Stack diameter: 1.13 ft
Planer mill: Stetson planer mill	<u>Planer mill: Stetson planer mill:</u> Manufacturer: Stetson; installed in 1989; rate: 1600 ft/min. Shaving generated from the process are pneumatically transferred to a cyclone. A baghouse was added to the planer's cyclone in 1994.	<u>Cyclone:</u> Manufacturer: NA <u>Baghouse:</u> Manufacturer: Donaldson-Day (Torit) Model: 276-RFW-10 Air-to-cloth ratio: 9:1	<u>Stetson Cyclone</u> Height above ground: 68 ft Exit velocity: 62.5 ft/sec Exit temperature: 68 °F Stack diameter: 3.0 ft <u>Baghouse</u> Height above ground: 80.0 ft Exit velocity: 26.9 ft/sec Exit temperature: 68 °F Stack diameter: 1.95 ft

## ***Emissions Inventories***

### **Potential to Emit**

Since this proposed project is only for a conversion of the facility's existing T2 OP/PTC permit to stand-alone PTC, emissions will not change as a result of issuance of this permit. The emission inventory existed in the permit No. T2-2012.0034, Project No. 61070, issued December 5, 2012 is used for this permitting action. All emission rates and throughput/production limits in the existing permit are carried over to the revised permit. There are no changes have occurred at the IFG facility that would result in an emissions increase of any regulated air pollutant since the issuance of the T2 OP/PTC on December 5, 2012. The main purpose of this permitting action is to eliminate the expiration date on the T2 OP/PTC so that it would not be in conflict with the expiration date of the facility's Tier I operating permit.

However, the permit writer assigned to this project has carried over the emissions inventories found in T2 OP/PTC's statement of basis (SoB) for permit No.P-2012.0034 Proj 61070, issued December 5, 2012 to the SoB for this permitting action, which is as follows:

With the exception that HAPs are now limited to less than 10 tons per year for any one HAP and less than 25 tons per year for all HAPs combined and the allowable VOC emission increases to 75.7 tons per year the existing facility-wide emission inventory provided in the August 31, 2009 statement of basis has not changed.

IFG has proposed to limit HAP emission to below 10 tons per year for any one HAP and below 25 tons per year for all HAPs and to calculate emission each month to assure compliance. The application included a spreadsheet to calculate HAP emissions from the drying kilns which is based on emission factors given in a 2008 research paper<sup>1</sup>. DEQ reviewed IFG's calculations and determined that some changes needed to be made to the emission factors used in the spreadsheet. Table 2 presents the applicants proposed emission factors submitted on October 5, 2012 and DEQ changes to those factors, including a description of why the changes were made. IFG's October 5, 2012 emission factor submittal is included in Appendix A.

Volatile organic compound (VOC) emissions increase solely due to a change in the VOC emissions factors. The change in the VOC emission limit is detailed in the PSD Classification section of this Statement of Basis.

---

<sup>1</sup> Emissions of hazardous air pollutants from lumber drying, Mike Milota/Paul Mosher, Forest Product Journal, July/August 2008  
2012.0034 PROJ 61335

**Table 2. Emissions Factors**

Lumber Type	Total HAP (lb/mbf) <sup>1</sup>	Methanol (lb/mbf) <sup>1</sup>	VOC (lb/mbf) <sup>1</sup>	Explanation for Changing the Emission Factor Proposed by IFG
Ponderosa Pine	0.148	0.102	2.46	
Douglas Fir	0.171	0.096	1.03	
Larch	0.291	0.187	0.25	
Hemlock	<del>0.25</del> 0.243	0.133	0.24	IFG's method of using the average of source test results was used to determine the total HAP factor as was used for the methanol factor
Grand (White) Fir	0.189	0.122	<del>0.68</del> 0.70	96' study emission factor is 0.57 lb/mbf as carbon, multiply times 1.22 = 0.7 as propane
Hem Fir	<del>0.25</del> 0.243	0.133	<del>0.68</del> 0.70	Emission factors changed for the reasons discussed above. Hem Fir is made up of wood from the Grand Fir and Hemlock groups. The maximum factor from the two groups is used.
Lodgepole	<del>0.07</del> 0.092	0.060	<del>1.3</del> 1.32	IFG states HAPs similar to spruce, therefore spruce total HAP factor (.092) is used. Same logic was used for Methanol. VOC factor from 00' study - VOC is 1.08 lb/mbf as carbon, multiply times 1.22 = 1.32 as propane
Spruce	0.092	0.054	0.11	
Engleman Spruce/Lodge Pole (ESLP)	0.092	0.054	<del>1.3</del> 1.32	The maximum factor from the two groups is used.
Alpine Fir	0.291	0.187	<del>0.68</del> 0.70	
Cedar	0.092	0.054	<del>0.14</del> 0.15	The factor from the 96' study is 0.12 lb/mbf as carbon, multiply times 1.22 = .15 as propane.
Any other type	0.291	0.187	2.46	The maximum of all factors is used.

<sup>1</sup> Pounds per thousand board feet.

The carbon dioxide gas emissions and its equivalent (CO<sub>2</sub>e) are equal to 925.55 T/yr – see supplemental information submitted by IFG on April 2, 2014 (Trim Record Number 2014AAG600).

### **Ambient Air Quality Impact Analyses**

Since emissions will not increase as a result of this permitting action, the ambient impact analysis is not required.

## **REGULATORY ANALYSIS**

### ***Attainment Designation (40 CFR 81.313)***

The facility is located in Boundary County which is designated as attainment or unclassifiable for PM<sub>2.5</sub>, PM<sub>10</sub>, CO, NO<sub>2</sub>, SO<sub>2</sub>, and Ozone. Refer to 40 CFR 81.313 for additional information.

### ***Facility Classification***

This facility is a major facility as defined by IDAPA 58.01.01.008.10 because it emits or has the potential to emit CO in amounts greater than or equal to major facility threshold(s) listed in Subsection 008.10. The Aerometric Information Retrieval System (AIRS) facility classification is A.

### ***Title V Classification (IDAPA 58.01.01.300, 40 CFR Part 70)***

The facility is classified as a major facility, as defined by IDAPA 58.01.01.008.10.c, because it emits or has the potential to emit carbon monoxide above the major source threshold of 100 tons per year. The facility has a Tier I operating permit that was issued on May 24, 2010, and expires on May 24, 2015.

### ***PSD Classification (40 CFR 52.21)***

The following section of the PSD Classification in this statement of basis is taken directly from T2/PTC No. P-2012.0034 Project No. 61070, issued December 5, 2012.

The facility is classified as an existing major stationary source, because the estimated emissions carbon monoxide have the potential (700 T/yr) to exceed major stationary source thresholds. The facility is not a designated facility as defined in 40 CFR 52.21(b)(1)(i)(a).

As described in detail in the August 31, 2009 Statement of Basis VOC emissions from the lumber drying kilns has been limited to 61.7 tons per year in order to prevent triggering PSD permitting requirements for the kiln modifications that occurred in 1988. Since the August 31, 2009 Statement of Basis more information has become available regarding VOC emissions from lumber drying kilns. Because the VOC emissions factors change the PSD avoidance analysis in the August 31, 2009 Statement of Basis was re-analyzed to determine an updated VOC emission limit to avoid triggering PSD.

IFG proposed increasing the allowable VOC emission limit for the kilns from 61.7 T/yr. to 75.7 tons per year. This increase is solely due to changes in emission factors. The facility wide VOC emission limit is set at 39.9 tons per year greater than the actual annual average emissions at the facility during 1986 and 1987 time period as described in the August 31, 2009 Statement of Basis. This limits emissions below PSD thresholds for the 1988 Kiln modifications. Using the IFG PSD avoidance review methodology, which is the same as DEQ's August 31, 2009 methodology, and the updated emission factors in Table 2 the allowable VOC emissions from the Kilns was determined.

**Determining the average VOC emissions from the Kilns during the 1986 and 1987 period.**

Species	Percent	VOC EF (lb/mbf)	VOC Weighted Average (lb/mbf)
Ponderosa	0.7	2.46	0.017
Douglas Fir	45.6*2/3	1.03	0.313
Larch	45.6*1/3	0.25	0.038
Hem Fir	22.6	0.70	0.158
ESLP	29.6	1.32	0.391
Cedar	1.5	0.146	0.0022
Weighted Factor			0.92

Annual average lumber throughput during 1986 and 1987 was 91,960 mbf. VOC emissions from the kilns are 91,960 mbf x 0.92 lb/mbf x ton/2,000 lb = 42.3 tons per year. VOC emissions from the boiler were 18.9 tons per year. Total VOC emissions were 61.2 tons per year (42.3 + 18.9).

The facility wide VOC limit is then 61.2 + 39.9 = 101.1 tons per year to avoid triggering PSD for the 1988 kiln modification.

Boiler VOC emissions are now inherently limited to 25.4 tons per year by the existing permit. This leaves 101.1 – 25.4 = 75.7 tons per year for the kilns.

**Permit to Construct (IDAPA 58.01.01.201)**

IDAPA 58.01.01.201 ..... Permit to Construct Required

The permittee has requested that a PTC be issued to the facility to convert the facility' existing combo T2/PTC to a stand-alone PTC. The requirements for the conversion have been met by the permittee; therefore, a PTC is required to be issued in accordance with IDAPA 58.01.01.220. This permitting action was processed in accordance with the procedures of IDAPA 58.01.01.200-228.

**Tier II Operating Permit (IDAPA 58.01.01.401)**

IDAPA 58.01.01.401 ..... Tier II Operating Permit

The applicant requested, in writing, that the existing T2/PTC No. P-2012.0034 Project No. 61070, issued December 5, 2012 be replaced by a PTC to avoid recurring renewals and fees. This request is consistent with current permitting practice. Therefore, the requirements under IDAPA 58.01.01.400-410 do not apply and a PTC will be issued instead.

**MACT Applicability (40 CFR 63)**

**40 CFR 63, Subpart DDDDD** National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters

The facility is classified as not major source for HAP emissions; therefore it is not subject to the requirements of 40 CFR 63, Subpart DDDDD.

**40 CFR 63, Subpart JJJJJJ** National Emission Standards for Area Sources: Industrial/Commercial/Institutional Boilers

Because the facility-wide HAP emissions are below major source thresholds, IFG Moyie Springs is subject to the area source boiler MACT, Subpart JJJJJJ. The facility is operating under a Tier I operating permit No. T1-2007.0072 which will expire on May 24, 2015, it is best to address the applicable requirements of Subpart JJJJJJ during the renewal process of the TV operating permit to the facility.

### ***NSPS Applicability (40 CFR 60)***

The facility is not subject to any NSPS requirements 40 CFR Part 60.

**40 CFR 60, Subpart Db** Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units

The Kipper and Sons hog fuel fired boiler at the facility has a capacity of 128 MMBtu/hr and was installed in 1972, before the promulgated construction date (June 19, 1984) of the NSPS, subpart Db. Therefore, in accordance with 40 CFR 60.40b, the NSPS does not apply to the boiler.

### ***Other Rules as Applicable***

For a complete listing of applicable rules for this facility, refer to the detailed emission inventory information provided in the Statement of Basis for the Tier I operating permit that is being prepared concurrently with this PTC.

### ***Permit Conditions Review***

This section describes only those permit conditions that have been added, revised, modified or deleted as a result of this permitting action.

#### New Permit Condition 2.13

### ***"Incorporation of Federal Requirements by Reference***

Unless expressly provided otherwise, any reference in this permit to any document identified in IDAPA 58.01.01.107.03 shall constitute the full incorporation into this permit of that document for the purposes of the reference, including any notes and appendices therein. Documents include, but are not limited to:

- Applicable requirements of National Emission Standards for Hazardous Air Pollutants (NESHAP), 40 CFR Part 63

For permit conditions referencing or cited in accordance with any document incorporated by reference (including permit conditions identified as NESHAP), should there be any conflict between the requirements of the permit condition and the requirements of the document, the requirements of the document shall govern, including any amendments to that document."

#### Existing Permit Condition 3.18

The following permit condition existed in PTC No.P-2012.0034 Project No. 61070, issued December 5, 2012:

"The permittee shall comply with all applicable provisions of 40 CFR 63 Subpart JJJJJJ – National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources. This subpart was promulgated on March 21, 2011 with a compliance date of March 21, 2014. EPA proposed changes to the emission standards of this subpart on December 23, 2011, the outcome of the proposed changes are pending at the time of permit issuance.

### New Permit Condition 3.18

#### **“40 CFR 63 Subpart JJJJJJ – National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources**

The permittee shall comply with all applicable provisions of 40 CFR 63 Subpart JJJJJJ.”

The MACT Subpart JJJJJJ applies to the hog fuel boiler existing at IFG at Moyie Springs. The requirements of this subpart are included in this permitting action as a high level citation instead of a detailed citation because the MACT requirements will be addressed in details in the forthcoming Tier I operating permit renewal, which expires on May 24, 2015.

For more detailed Permit Condition Review for this permitting action, the reader can refer to the Statement of Basis for the PTC No. P-2012.0034 Project No. 61070, issued on December 5, 2012.

### Permit Condition 3.9

The previous wording of “Within 60 days of permit issuance” existed in permit No. P-2012.0034 Project No. 61070, issued on 12/5/2014 is deleted for this permitting action. Also, the previous statement in the same permit condition which states the following: “The baghouse procedures document shall be submitted to DEQ within 60 days of permit issuance for review and comment” has been removed. Comments on the draft permit from the Coeur d’Alene Regional Office staff has confirmed that the requested document was submitted to DEQ (see Trim Record No. 2014AAG474).

### Permit Condition 3.11

The following permit condition No. 3.11 which states “The permittee shall remove the chip surge bin and the hog fuel mix bin cyclones and their associated stacks, as requested by the permittee.” is deleted from this permitting action because these processes are no longer existing at the facility per the DEQ’s Regional Office inspector (see Trim Record No. 2014AAG474).

### Permit Condition 5.3

Permit Condition No. 5.3 which states the following “The baghouse procedures document shall be submitted to DEQ within 60 days of permit issuance for review and comment and shall contain a certification by a responsible official.” is deleted from this permitting action because the baghouse procedure document is already submitted to DEQ by the permittee, per the DEQ’s Regional Office comments on the draft permit (see Trim Record No. 2014AAG474).

### PTC General Provisions:

The most current version of PTC General Provisions is used in this permit, as described below:

The duty to comply general compliance provision requires that the permittee comply with all of the permit terms and conditions pursuant to Idaho Code §39-101.

The maintenance and operation general compliance provision requires that the permittee maintain and operate all treatment and control facilities at the facility in accordance with IDAPA 58.01.01.211.

The obligation to comply general compliance provision specifies that no permit condition is intended to relieve or exempt the permittee from compliance with applicable state and federal requirements, in accordance with IDAPA 58.01.01.212.01.

The inspection and entry provision requires that the permittee allow DEQ inspection and entry pursuant to Idaho Code §39-108.

The requirement in Permit Condition 7.5 that “this permit shall expire if construction has not begun within two years of its issue date, or if construction is suspended for one year” does not apply to this permit revision.

The construction and operation notification provision in Permit Condition 7.6 requires that the permittee notify DEQ of the dates of construction and operation, in accordance with IDAPA 58.01.01.211. For this permitting action, the notification requirements in Permit Condition 7.6 do not apply.

The performance testing notification of intent provision requires that the permittee notify DEQ at least 15 days prior to any performance test to provide DEQ the option to have an observer present, in accordance with IDAPA 58.01.01.157.03.

The performance test protocol provision requires that any performance testing be conducted in accordance with the procedures of IDAPA 58.01.01.157, and encourages the permittee to submit a protocol to DEQ for approval prior to testing.

The performance test report provision requires that the permittee report any performance test results to DEQ within 30 days of completion, in accordance with IDAPA 58.01.01.157.04-05.

The monitoring and recordkeeping provision requires that the permittee maintain sufficient records to ensure compliance with permit conditions, in accordance with IDAPA 58.01.01.211.

The excess emissions provision requires that the permittee follow the procedures required for excess emissions events, in accordance with IDAPA 58.01.01.130. If a reportable excess emission event occurs, send the notifications to the DEQ Coeur d'Alene Regional Office as described in the rule.

The certification provision requires that a responsible official certify all documents submitted to DEQ, in accordance with IDAPA 58.01.01.123.

The false statement provision requires that no person make false statements, representations, or certifications, in accordance with IDAPA 58.01.01.125.

The tampering provision requires that no person render inaccurate any required monitoring device or method, in accordance with IDAPA 58.01.01.126.

The transferability provision specifies that this permit to construct is transferable, in accordance with the procedures of IDAPA 58.01.01.209.06.

The severability provision specifies that permit conditions are severable, in accordance with IDAPA 58.01.01.211.

## **PUBLIC REVIEW**

### ***Public Comment Opportunity***

Because this permitting action does not authorize an increase in emissions, an opportunity for public comment period was not required or provided in accordance with IDAPA 58.01.01.209.04 or IDAPA 58.01.01.404.

**APPENDIX A – EMISSION FACTORS  
(Trim Record Number 2012AAG2928)**

**Idaho Forest Group, Moyie Springs**  
**Evaluation of Dry Kiln VOC and HAP Emission Factors**

**Table of Contents**

I.	Executive Summary.....	15
II.	IFG Kiln Drying Temperatures.....	15
III.	Development of VOC Emission Factors.....	15
a.	Dry Kiln VOC Emission Research .....	16
b.	VOC Emission Factors by Wood Species .....	16
c.	Revision of Table 8 Using Updated VOC Emission Factors.....	19
IV.	Re-evaluation of Previous Actions .....	19
a.	1985 #4 Kiln Addition .....	19
b.	1988 Kiln Extension .....	20
V.	Permit Limits to Avoid Triggering PSD.....	20
VI.	Kiln HAP Emission Factors.....	21
a.	Dry Kiln HAP Emission Research.....	21
b.	Methanol Emission Factors by Wood Species.....	21
VII.	Revised Table 4.4 from Facility Draft Permit .....	23

## **I. Executive Summary**

Idaho Forest Group (IFG) owns and operates a sawmill at Moyie Springs, Idaho which has Facility ID No. 021-0001. The mill is regulated under Idaho Tier I Operating Permit #T1-2007.0072 and Tier II/PTC #T2-050113.

IFG has filed a PTC application requesting limits on hazardous air pollutants (HAPs) so that the mill will be classified as a minor HAPs source. DEQ has provided a facility draft permit which includes conditions that change the way method for tracking compliance with the volatile organic compound (VOC) emissions limits.

IFG understands that DEQ has the authority to include VOC tracking conditions in the modified PTC permit. IFG's concern is that the VOC emission factors proposed for tracking VOC compliance are different from the factors used to set the current kiln VOC limit. It isn't accurate to demonstrate compliance with the existing kiln VOC limit using current VOC emission factors.

IFG has reviewed all available VOC emission factor research and developed revised VOC emission factors to be used in setting the VOC permit limit. The same factors will be used in demonstrating compliance with the kiln VOC emission limit.

IFG is requesting revisions to the baseline VOC emission calculations used to develop the kiln VOC limit, based on current VOC emission factors. The analysis would result in the dry kiln VOC limit being increased from 61.7 tons per year (tpy) to 75.7 tpy. The corresponding dry kiln production limit would decrease from 199 million board feet per rolling 12-month period (mmbf/yr) to 165 mmbf/yr. The current IFG permit application includes a proposed reduction of the allowable lumber production to 160 mmbf/yr to ensure compliance with the proposed HAPs limits.

## **II. IFG Kiln Drying Temperatures**

Much of the original kiln VOC emission research was performed at dry kiln temperatures of 180°F or less. The revised VOC emission calculations are based on more recent research using kiln drying temperatures as high as 235°F. The current and previous owners of the Moyie Springs sawmill have routinely dried lumber at temperatures higher than 200°F; therefore the current emission factors are appropriate for evaluating kiln emissions from past projects.

IFG determines the maximum kiln set temperature for each species based on the optimal balance between kiln drying time and lumber quality. The purpose of the drying method is to dry the lumber as quickly as possible, while minimizing drying defect, which downgrades the product quality, resulting in financial losses. IFG has identified the highest temperature each wood species can be dried at while minimizing the drying defect. Any increases in kiln temperature above that level would not decrease drying time but could increase drying defect.

IFG has no operational incentive to dry wood at temperatures higher than those used in this analysis. Therefore, there is no reason to assign maximum kiln temperature limits in the air quality permit.

## **III. Development of VOC Emission Factors**

Tier II/PTC #T2-050113 includes an emission limit for VOCs that was developed through a previous permitting action. The VOC limit of 61.7 tpy VOC from the dry kilns is considered a Prevention of Significant Deterioration (PSD)-avoidance condition, and compliance is demonstrated by staying within a kiln production limit of 199 mmbf/yr. The kiln production limit was arrived at by applying the VOC emission factors contained in Table 8 of the Tier II/PTC #T2-050113 Statement of Basis (Table 8).

Table 8 lists emissions factors for some of the species dried at the Moyie Springs mill, but other key species are omitted. Furthermore, the references used to develop the emission factors do not account for recent VOC emission studies using higher dry kiln temperatures. The dry kilns at Moyie Springs are operated at kiln set point temperatures higher than 200°F, and have been operated at those temperatures as long mill history is available. The emission factors included in Table 8 are based on studies that used kiln temperatures less than 200°F for all species (except lodgepole pine as discussed below).

As shown in Table 8, the current kiln PTC limit was developed based on the average species mix of wood dried at Moyie Springs from 1996 to 2000. The species mix is still representative, but a number of issues have been identified as described below.

#### **a. Dry Kiln VOC Emission Research**

The definitive studies for VOC emissions from kiln drying were performed in 1996 at the University of Idaho (U of I) and 2000 at the Oregon State University (OSU). Subsequent kiln drying research focused on primarily on HAP emissions. The VOC emission factors listed in Table 8 are based on the 1996 U of I study and the 2000 OSU study. OSU researchers published an additional study in the July 2008 Forest Products Journal, which examined the effect of higher kiln temperatures on HAP from dry kilns. This study was submitted for publication in August 2007, and is referred to as the 2007 OSU study. The 2007 OSU study also measured total hydrocarbons, as a measurement of VOC.

The various dry kiln emissions studies have produced a range of VOC emission values at various temperatures. IFG has concluded that that the available data does not support the idea that VOC and HAP emissions have an linear relationship with the test temperature. Therefore, the emission factors used in this analysis were determined by interpolating between the emission factors for the two temperatures most closely bracketing the target temperature.

#### **b. VOC Emission Factors by Wood Species**

The following is a discussion of the VOC emission factors for each wood species processed by IFG. Some of the research results were reported as ‘pounds per thousand board feet (lb/mbf) as carbon’ and were converted to units of ‘lb/mbf as propane’ using the conversion factor presented in Table 8. All the emissions factors discussed below are in units of lb/mbf as propane.

**Ponderosa Pine (p-pine).** The p-pine emission factor in Table 8 is equivalent to 2.23 lb/mbf as propane. The p-pine emission factor came from the 1996 U of I study, in which p-pine was dried at a dry bulb set point temperature of 170°F. The 2000 OSU study dried p-pine at 170°F and developed an emission factor of 1.66 lb/mbf. The 2007 OSU study dried p-pine at temperatures of 170°F and 235°F, and produced respective VOC emission factors of 1.59 and 3.00 lb/mbf.

IFG dries ponderosa pine with a maximum kiln set temperature of 210°F. The VOC emission factor for drying p-pine at 210°F was developed by interpolating between the two temperatures in the 2007 OSU study. The resulting p-pine VOC emission factor is 2.46 lb/mbf.

**Douglas Fir (DF)**. Table 8 does not list DF, but the percentage of larch produced clearly represents the combined DF and larch production. DF emission factor information is available in all three of the VOC emission factor studies being considered. The 1996 U of I study included both DF heartwood and DF sapwood, and the samples were dried at a dry bulb set point temperature of 180°F. The 1996 U of I test results were 0.25 lb/mbf for sapwood and 0.97 lb/mbf for DF heartwood. Later VOC studies tested DF wood as received, without differentiating between sapwood and heartwood. The 2000 OSU study dried DF at 160°F and developed an emission factor of 0.59 lb/mbf.

The 2007 OSU study ran 5 DF tests at temperatures ranging from 170°F to 235°F. The emission factor at 170°F was 0.24 lb/mbf and the emission factor at 180 F was 0.58 lb/mbf, showing good consistency with previous studies.

The 2007 OSU study produced an average emission factor of 0.79 lb/mbf at 200°F, and 1.21 lb/mbf for DF dried at 235°F. IFG dries DF with a maximum kiln set temperature of 220°F, and the VOC emission factor of 1.03 lb/mbf at 220°F was developed by interpolating between the 200°F and 235°F factors.

**Larch**. Larch has not been studied separately in any of the VOC emission studies, but IFG has found that larch dry kiln schedules are similar to hemlock schedules. Table 8 of the current permit uses the emission factor for hemlock to represent larch emissions, which seems appropriate.

The larch emission factor in Table 8 is 0.29 lb/mbf and came from the 1996 UI study, in which hemlock was dried at a dry bulb set point temperature of 200°F. The 2000 OSU study did not include hemlock or larch. The 2007 OSU study dried western hemlock at temperatures ranging from 180°F to 235°F, and produced respective VOC emission factors ranging from 0.14 to 0.25 lb/mbf. IFG dries larch with a maximum kiln set temperature of 235°F, so the appropriate emission factor for larch is 0.25 lb/mbf.

**Hemlock or Western Hemlock**. IFG currently tracks hemlock production in a wood group referred to as Hem-Fir (HF). This evaluation also includes a separate hemlock emission factor to be used if IFG chooses to track hemlock separately in the future, Hemlock emission factors are discussed above in the Larch section. However, IFG dries hemlock at a maximum kiln set temperature of 220°F, so the appropriate emission factor for hemlock is 0.24 lb/mbf based on interpolation of the 2007 OSU study results.

**Hem-Fir (HF)**. HF includes western hemlock and grand (white) fir, which are currently tracked as a group in the kiln production. Alpine fir (AF) is dried separately, and will be evaluated using the same emission factor as grand (white) fir.

The 1996 U of I study included grand fir and white fir separately, but IFG considers them to be the same species. The grand (white) fir test results were 0.64 lb/mbf at 200°F and 0.68 lb/mbf at 190°F. The 2000 OSU study dried white fir at 180°F and developed an emission factor of 0.31 lb/mbf. The 2007 OSU study includes a wood group called “white wood”, but this group is at least 50 percent ponderosa pine, and is therefore not representative of fir species.

The HF group contains both hemlock and fir, but emissions will be calculated using the fir emission factor to provide a conservative result. IFG dries HF with a maximum kiln set temperature of 220°F. Since the firs in the HF group dry similarly to hemlock, the hemlock results in the 2007 OSU study were used to evaluate the increase of grand (white) fir VOC emissions as a result of increased kiln temperature. VOC emissions from drying hemlock increased by 4% between temperatures of 200°F and

235°F. Therefore, grand (white) fir emissions are expected to increase from 0.64 to 0.67 lb/mbf as a result of the higher drying temperature. Since the 1996 U of I test showed 0.68 lb/mbf at 190°F, this VOC emission factor will be used for HF.

**Engelmann Spruce, Lodge Pole and Alpine Fir (ESLPAF).** IFG dries lodgepole (LP) and Engelmann spruce (ES) together and alpine fir (AF) separately. LP was included in the 2000 OSU study, but not the other studies. The emission factor of 1.30 lb/mbf developed from this study is listed in Table 8. During the 2000 OSU study, the LP was dried at a temperature of 240°F, so the single emission factor is applicable for all temperatures. White spruce was included in the 2007 OSU study, and showed VOC emissions of 0.11 lb/mbf at a drying temperature of 235°F. IFG dries the ESLP group at a maximum kiln set temperature of 210°F, so the LP factor of 1.30 lb/mbf is used for ESLP.

IFG dries and tracks AF separately and dries AF at a maximum kiln set temperature of 235°F. As with grand (white) fir, the drying of AF is expected to be similar to hemlock, although it is dried at a higher temperature. The VOC emission factor of 0.68 lb/mbf will be used for AF. If IFG dries any other white wood species that are not specifically identified, the VOC emissions will be calculated using the AF factor.

**Cedar and Redwood.** Cedar and redwood were tested in the 1996 U of I study and both species were found to have VOC emissions of 0.14 lb/mbf, when dried at 160°F to 170°F. IFG occasionally dries cedar, using kiln temperatures within the range of the test method. The emission factor of 0.14 lb/mbf is used for cedar.

**c. Revision of Table 8 Using Updated VOC Emission Factors**

Table 8 from the SOB of the current Moyie Springs permit has been revised using the species-specific VOC emission factors, as discussed in the previous section. The larch category from the original Table 8 is presumed to be 2/3 DF and 1/3 larch. The mixed category in the original Table 8 is presumed to be cedar.

**Table 8, Updated August 22, 2012  
IFG Moyie Springs Facility  
Species Mix and Estimated VOC Emission Factor**

Average Species Mix for 1996 through 2000

Species	Percent	VOC EF (lb/mbf)	Weighting/ Weighted Average	Notes
Ponderosa Pine	0.7	2.46	0.017	2007 OSU Study
Douglas Fir	45.6 * 2/3	1.03	0.313	2007 OSU Study
Larch	45.6 * 1/3	0.25	0.038	1996 U of I Study
Hemlock		0.24		2007 OSU Study
Grand (White) Fir		0.68		1996 U of I Study
Hem Fir	22.6	0.68	0.154	1996 U of I Study
Lodgepole		1.3		2000 OSU Study
Spruce		0.11		2007 OSU Study
ESLP	29.6	1.30	0.385	2000 OSU Study
Alpine Fir		0.78		1996 U of I Study
Cedar	1.5	0.14	0.012	1996 U of I Study
		<b>Weighted Factor</b>	<b>0.92</b>	

**IV. Re-evaluation of Previous Actions**

The regulatory review for Tier II/PTC #T2-050113, contained in Section 4 of the SOB, determined whether previous changes at the mill had triggered PSD permitting requirements. The previous mill modifications were the 1985 #4 kiln addition, the 1988 kiln extension, the 1989 Stetson planer modification, and the 1996 stud mill 2x4 stacker modification. Only the kiln addition and kiln extension projects are affected by the revised VOC emission factor.

**a. 1985 #4 Kiln Addition**

The 1983 actual steam production was 322,538 thousand pounds of steam (mlb) and the 1984 actual steam production was 291,852 mlb, giving an average actual steam production of 307,195 mlb/yr. Using the boiler VOC emission factor of 0.13 lb/mlb, the actual VOC emissions were 20.0 tpy. The 1983 actual kiln production was 58,650 mbf in the stud mill kilns and 23,335 mbf in the sawmill kilns, for a total of 81,985 mbf. The sawmill kilns were deactivated in August 1983 and not used again. The 1984 actual kiln production was 63,590 mbf, giving an average actual kiln production of 72,788 mbf. Using the revised VOC emission factor of 0.92 lb/mbf, the actual kiln VOC emissions were 33.5 tons. Total actual VOC emissions were 53.5 tpy.

The post-modification potential steam production was 324,120 mlb/yr, giving a potential VOC emission from the boiler of 21.1 tpy. The post-modification potential kiln production was 129,650 mbf/yr, giving a potential VOC emission from the kilns of 59.6 tpy and a total VOC potential of 80.7 tpy. The net

emissions increase resulting from the 1985 #4 kiln addition was 27.2 tpy (80.7 tpy – 53.5 tpy), which is below the PSD significant emission rate (SER) of 40 tpy. Therefore, using the revised VOC emission factor, the 1985 #4 kiln addition did not trigger PSD permitting.

#### **b. 1988 Kiln Extension**

The 1986 actual steam production was 293,304 mlb and the 1987 actual steam production was 288,948 mlb, giving an average actual steam production of 291,126 mlb/yr. Using the boiler VOC emission factor of 0.13 lb/mlb, the actual VOC emissions were 18.9 tpy. The 1986 actual kiln production was 88,630 mbf and the 1987 actual kiln production was 95,290 mbf, giving an average actual kiln production of 91,960 mbf. Using the revised VOC emission factor of 0.92 lb/mbf, the actual kiln VOC emissions were 42.3 tons. Total actual VOC emissions were 61.2 tpy.

The post-modification potential steam production was 512,480 mlb/yr, giving a potential VOC emission from the boiler of 33.3 tpy. The post-modification potential kiln production was 204,980 mbf/yr, giving a potential VOC emission from the kilns of 94.3 tpy and a total VOC potential of 127.6 tpy. The net emissions increase resulting from the 1988 Kiln Extension would have been 66.4 tpy (127.6 tpy – 61.2 tpy), which exceeds the PSD SER of 40 tpy. Therefore, using the updated VOC emission factor, the 1988 kiln extension would have triggered PSD permitting if permit limits were not implemented to avoid PSD.

#### **V. Permit Limits to Avoid Triggering PSD**

In order to avoid triggering PSD, the PTC must limit the potential VOC emissions to the 1986/87 actual emissions plus an increase of 39.9 tpy. The resulting allowable VOC emission rate is 101.1 tpy (61.2 tpy + 39.9 tpy). Tier II/PTC #T2-050113 imposed a boiler steaming limit of 391,000 mlb steam/yr, resulting in a boiler VOC potential of 25.4 tpy. As a result, the allowable potential kiln VOC emissions are 75.7 tpy (101.1 tpy – 25.4 tpy). Using the revised kiln VOC emission factor of 0.92 lb/mbf, the mill dry kiln production limit would have to be 164,565 mbf/yr (165 mmbf/yr).

By revising the dry kiln composite emission factor, and reevaluating historical mill modifications, IFG has determined that the current PTC production limit of 199 mmbf/yr needs to be reduced to 165 mmbf/yr to avoid the PSD trigger. The current IFG PTC application requests a production limit of 160 mmbf/yr to allow the mill to comply with the proposed HAP emission limits. Therefore, the updated VOC emission limits can be used to show compliance with the revised kiln VOC emission limit of 75.7 tpy. The change of VOC emission factors and re-establishment of the VOC kiln emission limit is not a relaxation of permit limits.

## **VI. Kiln HAP Emission Factors**

### **a. Dry Kiln HAP Emission Research**

Dry kiln HAP emissions research was first published in the 2000 kiln emissions study, which included methanol and formaldehyde emissions in addition to VOCs. OSU researchers published an additional study in the July 2008 Forest Products Journal, which examined the effect of higher kiln temperatures on HAP emissions for dry kilns (2007 OSU Study). In August 2007, EPA Region 10 issued a letter to affected sawmills which provided dry kiln HAP emission factors based on the 2007 OSU study. The EPA list of VOC emission factors differentiated between dry kiln temperatures above and below 200°F for individual wood species.

Dry kiln HAP research has included five individual HAPs; methanol, formaldehyde, acetaldehyde, propionaldehyde and acrolein. The results have consistently shown that methanol is emitted in higher levels than the other HAPs at temperatures above 200°F. The following discussion will address species-specific methanol emission factors. Emission factors for the other HAPs and for total HAPs have been determined using the same methodology.

### **b. Methanol Emission Factors by Wood Species**

The following is a discussion of the methanol emission factors for each wood species processed by IFG.

**Ponderosa Pine (p-pine).** The 2000 OSU study dried p-pine at 170°F and developed a methanol emission factor of 0.065 lb/mbf. The 2007 OSU study dried p-pine at temperatures of 170°F and 235°F, and produced respective methanol emission factors of 0.035 and 0.144 lb/mbf.

IFG dries ponderosa pine with a maximum kiln set temperature of 210°F. The methanol emission factor for drying p-pine at 210°F was developed by interpolating between the two temperatures in the 2007 OSU study. The resulting p-pine emission factor is 0.102 lb/mbf.

**Douglas Fir (DF).** The 2000 OSU study dried DF at 160°F and developed a methanol emission factor of 0.023 lb/mbf. The 2007 OSU study produced an average emission factor of 0.068 lb/mbf at 200°F, and 0.117 lb/mbf for DF dried at 235°F. IFG dries DF with a maximum kiln set temperature of 220°F, and the methanol emission factor of 0.096 lb/mbf at 220°F was developed by interpolation.

**Larch.** Larch has not been studied separately in any of the VOC emission studies, but IFG has found that larch dry kiln schedules are similar to hemlock schedules. The 2007 OSU study dried western hemlock at temperatures ranging from 180°F to 235°F, with the highest methanol emissions occurring at the 235°F temperature. IFG dries larch with a maximum kiln set temperature of 235°F, so the selected methanol emission factor for larch is the hemlock factor of 0.187 lb/mbf.

**Hemlock or Western Hemlock.** IFG currently tracks hemlock production in a wood group referred to as Hem-Fir (HF). Because IFG may track hemlock separately in the future, this discussion also includes a separate hemlock emission factor. IFG dries hemlock at a maximum kiln set temperature of only 220°F, so the methanol emission factor is based on interpolation of the average emission rate at 200°F of 0.61 lb/mbf, and the emission rate at 235°F of 0.187 lb/mbf. The selected methanol emission factor for hemlock dried at 220°F is 0.133 lb/mbf.

**Hem-Fir (HF).** HF is a wood group including western hemlock and grand fir (white fir).

The 2000 OSU study dried white fir at 180°F and developed a methanol emission factor of 0.122 lb/mbf. The available information for grand (white) fir has been used to develop a separate emission factor for this species to be used if IFG decides to track the species separately in the future. Since the HF group includes both hemlock and fir, and hemlock has a higher methanol emission factor, the methanol emission factor of 0.133 lb/mbf is used for HF.

**Engelmann Spruce, Lodge Pole and Alpine Fir (ESLPAF).** IFG dries lodgepole (LP) and Engelmann spruce (ES) together and alpine fir (AF) separately. During the 2000 OSU study, the LP was dried at a temperature of 240°F and the methanol emissions were found to be 0.060 lb/mbf. White spruce was included in the 2007 OSU study, and produced methanol emissions of 0.025 lb/mbf at 180°F and 0.078 lb/mbf at 235°F. IFG dries the ESLP group at a maximum kiln set temperature of 210°F, so the interpolated methanol emission factor for spruce would be 0.054 lb/mbf. Because the LP and spruce emission factors are very close, and the spruce factor can be interpolated for the lower drying temperature, the methanol emission factor of 0.054 lb/mbf is used for the ESLP group.

IFG dries and tracks AF separately and dries AF at a maximum kiln set temperature of 235°F. As with grand (white) fir discussed in the HF group above, the drying of AP is expected to be similar to hemlock. Because AF is dried at the top of the temperature range for the 2007 OSU study, the peak hemlock methanol emission factor of 0.187 lb/mbf will be used for AF. Other white wood species that are not specifically identified will use the AF HAP emission factors.

**Cedar and Redwood.** Cedar and redwood have not been included in the HAPs emissions testing. Because the cedar and redwood VOC emissions are similar to spruce emissions, IFG will use the spruce methanol emission factor of 0.054 lb/mbf for cedar and redwood.

**VII. Revised Table 4.4 from Facility Draft Permit**

In the draft PTC, DEQ included a Table 4.4 that summarized the kiln emission factors to be used for determining compliance with HAP and VOC limits. IFG proposes revising Table 4.4 of the facility draft permit as shown below. The rationale for each VOC and methanol emission factor is discussed above. Development of emission factor for the other HAPs is explained in the Moyie Springs emissions spreadsheet. Total HAP emissions are the sum of methanol, formaldehyde, acetaldehyde, propionaldehyde and acrolein emission factors.

**Table 4.4 EMISSIONS FACTORS  
IFG SUGGESTED REVISIONS**

Lumber Type	Total HAP (lb/mbf) <sup>1</sup>	Methanol (lb/mbf) <sup>1</sup>	VOC (lb/mbf) <sup>1</sup>
Ponderosa Pine	0.148	0.102	2.46
Douglas Fir	0.171	0.096	1.03
Larch	0.291	0.187	0.25
Hemlock	0.250	0.133	0.24
Grand (White) Fir	0.189	0.122	0.68
Hem Fir	0.250	0.133	0.68
Lodgepole	0.079	0.060	1.30
Spruce	0.092	0.054	0.11
ESLP	0.092	0.054	1.30
Alpine Fir	0.291	0.187	0.68
Cedar	0.092	0.054	0.14

<sup>1</sup> Pounds per thousand board feet.

## APPENDIX B – PROCESSING FEE

### PTC Fee Calculation

**Instructions:**

Fill in the following information and answer the following questions with a Y or N. Enter the emissions increases and decreases for each pollutant in the table.

**Company:** IFG LLC-Riley Creek-Moyie Springs  
**Address:** 3082 Roosevelt Drive  
**City:** Moyie Springs  
**State:** ID  
**Zip Code:** 83845  
**Facility Contact:** Chris Pease  
**Title:** Plant Manager  
**AIRS No.:** 021-00001

**N** Does this facility qualify for a general permit (i.e. concrete batch plant, hot-mix asphalt plant)? Y/N

**Y** Did this permit require engineering analysis? Y/N

**N** Is this a PSD permit Y/N (IDAPA 58.01.01.205.04)

<b>Emissions Inventory</b>			
Pollutant	Annual Emissions Increase (T/yr)	Annual Emissions Reduction (T/yr)	Annual Emissions Change (T/yr)
NO <sub>x</sub>	0.0	0	0.0
SO <sub>2</sub>	0.0	0	0.0
CO	0.0	0	0.0
PM10	0.0	0	0.0
VOC	0.0	0	0.0
TAPS/HAPS	0.0	0	0.0
<b>Total:</b>	<b>0.0</b>	<b>0</b>	<b>0.0</b>
<b>Fee Due</b>	<b>\$ 1,000.00</b>		

Comments:

