URS

April 27, 2007

Mr. Dan Jamieson
Air Permits Division
Texas Commission on Environmental Quality
12100 Park 35 Circle
Austin, TX 78753

AIR PERMITS DIVISION
APR 2 7 2007
RECEIVED

RE: Demonstration of Exemption From BART Requirements
TIN Inc., dba Temple-Inland
Orange Linerboard Mill
Orange County
Regulated Entity Number: RN100214428
Customer Reference Number: CN602787053
Account Number: OC-0019-C

Dear Mr. Jamieson:

On behalf of Temple-Inland, URS Corporation is submitting the attached BART modeling demonstration for the Orange Linerboard Mill as required in §116.1510. An electronic version will also be submitted directly to you. It is our understanding that the TCEQ will forward the modeling demonstration to EPA and the appropriate Federal Land Managers. The modeling demonstration shows that the Orange Linerboard Mill has a minimal impact on visibility at the modeled Class 1 areas and is not subject to BART requirements.

If you have any questions or require any additional information, please contact me at (512) 419-5453 or Mr. John Melancon with Temple-Inland at (409) 746-7416.

Sincerely,

Carole J. Stapper

Carole J. Stapper
Project Manager

cc: Mr. John Melancon, Environmental Manager, Temple-Inland

URS Corporation
P.O. Box 201088
Austin, TX 78720-1088
9400 Amberglen Blvd.
Austin, TX 78729

URS

April 27, 2007

Mr. Dan Jamieson
Air Permits Division
Texas Commission on Environmental Quality
12100 Park 35 Circle
Austin, TX 78753

Re: Best Available Retrofit Technology (BART) Modeling Demonstration
TIN Inc., dba Temple-Inland
Orange Linerboard Mill
Orange County, Texas
Regulated Entity Number: RN100214428
Customer Reference Number: CN602787053
Account Number: OC-0019-C

Dear Mr. Jamieson:

The enclosed modeling report demonstrates that the Temple-Inland Orange Linerboard Mill is exempt from the Best Available Retrofit Technology (BART) requirements since the Mill does not contribute to visibility impairment at a Class I area. I have reviewed the enclosed report, and to the best of my knowledge, the representations in the report are true and correct based on the information provided to me. Engineering design and operational data provided by other parties were reviewed for reasonableness. No expressed warranty is made on the accuracy of third party software and meteorological data sets that were used to develop the modeled impacts in support of the BART analysis. URS has used meteorological data sets and dispersion modeling software that are commonly used and implemented by professionals working in this field, and has exercised professional judgment when reviewing and using these data and software.

Sincerely,

Christopher J. Loughran

Christopher J. Loughran, P.E.

STATE OF TEXAS
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DEMONSTRATION OF EXEMPTION FROM BART REQUIREMENTS

Orange, Texas

Prepared by:

URS Corporation
9400 Amberglen Blvd.
Austin, TX 78729

April 2007

DEMONSTRATION OF EXEMPTION FROM BART REQUIREMENTS

TIN Inc., dba Temple-Inland
Orange, Texas

April 2007

Prepared for:

TIN Inc., dba Temple-Inland
Orange, Texas

Prepared by:

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9400 Amberglen Blvd.
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April 2007

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1.0 Introduction

Federal law requires Best Available Retrofit Technology (BART) for any BART-eligible source that ‘‘emits any air pollutant which may reasonably be anticipated to cause or contribute to any impairment of visibility” in any mandatory Class I federal area. Pursuant to federal regulations, states have the option of exempting a BART-eligible source from the BART requirements based on dispersion modeling demonstrating that the source cannot reasonably be anticipated to cause or contribute to visibility impairment in a Class I area. According to 40 CFR Part 51, Appendix Y (BART guideline), a BART-eligible source is considered to “contribute” to visibility impairment in a Class I area if the modeled change in deciviews is equal to or greater than the “contribution threshold.” Any BART-eligible source determined to cause or contribute to visibility impairment in any Class I area is subject to BART. Based on current regulatory guidance a “contribution threshold” of 0.5 deciviews (dv) is considered the value where a modeled BART eligible source may contribute to visibility impairment.

BART exemption modeling procedures for the Temple Inland Orange Mill (TIO), were outlined in a document titled *BART Exemption CALPUFF Modeling Protocol, Visibility Impairment Modeling Analysis for Temple-Inland, Orange, Texas* submitted on April 26, 2007. The modeling protocol describes the process and all model settings used in the exemption modeling. This document provides additional information about the modeled sources and presents the results of the exemption modeling. The results of this modeling analysis show that TIO has a minimal impact on visibility at the modeled Class 1 areas and is not subject to BART requirements specified in 40 CFR 51 Subpart P, 40 CFR 51 Appendix Y, or 30 TAC 116 Subchapter M.

2.0 BART Source Information

Emissions units at the TIO Mill that are considered BART eligible were constructed or reconstructed between August 7, 1962 and August 7, 1977 and emit at least one visibility-impairing air pollutant (in this case NO_x, SO_2, PM_{10} or $PM_{2.5}$). The BART eligible units at TIO include boilers, recovery furnaces, smelt dissolving tanks, a lime kiln, lime slakers, and fugitive sources. A list of modeled sources, stack parameters, and emission rates are provided in Table 2-1 (point sources) and Table 2-2 (area sources). Table 2-3 lists the basis of the modeled emission rates.

It should be noted that some of the modeled emission rates are actually higher than current permitted emission limits. Per TCEQ guidance, these additional emissions were included to accommodate proposed changes to permit limits for a new project at TIO. These additional emission rates have not been finalized as this project is still in the planning phase. Temple-Inland expects the permit application to be submitted to the TCEQ in June 2007.

2.1 Model Refinements

Several model refinements were used in the TIO BART exemption modeling that were not explicitly outlined in the modeling protocol. These model refinements are described below.

2.1.1 Assumed all Emitted Particulate is $PM_{2.5}$

No speciated particulate information was readily available for the TIO Mill. Instead, the emission rates for PM_{10} were used in the exemption modeling for both PM_{10} and $PM_{2.5}$. The $PM_{2.5}$ emissions listed in Table 2-3 are equal to the PM_{10} emissions. By modeling the PM_{10} emissions as PMC (coarse particulate matter) and the $PM_{2.5}$ emissions as PMF (fine particulate matter), the emissions are essentially being double-counted in the model. The TCEQ BART modeling protocol suggests that in the absence of particulate speciation data, it may be assumed that all particulate is $PM_{2.5}$ (PMF). This is still a conservative assumption because PMF has a greater impact on visibility impairment than does PMC. Although both PM_{10} and $PM_{2.5}$ emission rates were included in the CALPUFF runs, the PM_{10} (PMC) was removed in the CALPOST runs using the setting LVPMC = F.

This refinement was only utilized with those model runs that initially predicted impacts above 0.5 dv.

2.1.2 Class 1 Area Specific Rayleigh Scattering

The default value of 10 Mm^{-1} is used to describe Rayleigh scattering in the TCEQ BART modeling protocol. This value is used in the visibility impact calculations performed in CALPOST. Rayleigh scattering is the scattering of light by particles much smaller than the wavelength of the light, and the Rayleigh scattering value describes the efficiency of such light scattering. Each Class 1 area was given a specific Rayleigh scattering value by the Interagency Monitoring of Protected Visual Environments program (IMPROVE).

These values are available in Table A2 in one of their "Gray Literature" documents titled *Revised IMPROVE Algorithm for Estimating Light Extinction from Particle Speciation Data*. This document is available at

http://vista.cira.colostate.edu/IMPROVE/Publications/GrayLit/gray_literature.htm.

TIO used Class 1 area specific Rayleigh scattering values from this document in the CALPOST runs for the BART exemption modeling.

This refinement was only utilized with those model runs that initially predicted impacts above 0.5 dv.

2.1.3 New IMPROVE Visibility Equation

A revised algorithm used to calculate visibility was adopted for use by the IMPROVE Steering Committee in December 2005, and is described in the report referenced in Section 2.1.2. This document is a summary report by a subcommittee established by the IMPROVE Steering Committee at their July 2005 meeting to recommend a refined algorithm that would replace or be made available as an alternative to the current approach. The subcommittee included those who worked on the internal review as well as scientists who have been critical of the original IMPROVE algorithm. The primary purpose of this document is to describe the subcommittee's recommended revised algorithm, characterize its performance, and summarize the rationale for each of the changes from the currently used algorithm.

This revised algorithm used to calculate visibility has not yet been incorporated into CALPOST. In order to take advantage of the new IMPROVE equation, a section of the CALPOST output file may be copied into a spreadsheet (included in Appendix B), which applies the new equation and predicts visibility impacts. This spreadsheet was developed by Dr. Ivar Tombach, technical consultant to the VISTAS regional planning organization. This post-processing tool and accompanying instructions can be downloaded from the VISTAS website as follows:

http://www.vistas-sesarm.org/BART/CALPOST-NewIMPROVEformulaCalculationNO2RevP_Dec92006.xls

http://www.vistas-sesarm.org/BART/CALPOST-IMPROVEWorkbook_InstructionsV2_16-Oct06.pdf

The use of this post-processing tool has been allowed by states in the VISTAS region with regard to BART exemption modeling. TIO used the new IMPROVE equation (via the use of Dr. Tombach's spreadsheet), in conjunction with the standard CALPOST runs to calculate visibility impacts.

This refinement was only utilized with those model runs that initially predicted impacts above 0.5 dv.

Table 2-1 Stack Parameters for BART Eligible Units – Point Sources

Model ID	Unit Description	Coordinates				Base Elevation		Stack Height		Temperature		Exit Velocity		Stack Diameter	
		UTM Easting (m)	UTM Northing (m)	LCC Easting (m)	LCC Northing (m)	(ft)	(m)	(ft)	(m)	(F)	(K)	(ft/s)	(m/s)	(ft)	(m)
1A	No. 1 Recovery Furnace	428652	3342950	315.538	-1077.484	24.9	7.6	150	45.7	330	438.7	68	20.7	7	2.13
1B	No. 2 Recovery Furnace	428652	3342950	315.538	-1077.484	24.9	7.6	150	45.7	330	438.7	68	20.7	7	2.13
2	Bark Boiler	428569	3343166	315.445	-1077.270	24.6	7.5	150	45.7	152	339.8	63.1	19.2	8	2.44
2A	No. 1 PFI Boiler	428595	3343010	315.478	-1077.426	24.3	7.4	150	45.7	400	477.6	39	11.9	11	3.35
3	No. 1 Dissolving Tank	428632	3343018	315.515	-1077.417	24.9	7.6	135	41.1	200	366.5	15	4.6	3	0.91
4	No. 2 Dissolving Tank	428653	3343016	315.536	-1077.418	24.9	7.6	135	41.1	200	366.5	15	4.6	3	0.91
9	Lime Silo	428834	3343047	315.717	-1077.379	24.9	7.6	65	19.8	110	316.5	60	18.3	1.17	0.36
10	No. 1 Slaker	428819	3343043	315.702	-1077.383	24.9	7.6	50	15.2	145	335.9	24	7.3	1.33	0.41
11	Lime Kiln	428801	3343165	315.679	-1077.262	24.6	7.5	66	20.1	150	338.7	36.84	11.2	5.67	1.73
13	No. 2 Slaker	428812	3343050	315.695	-1077.377	24.9	7.6	50	15.2	145	335.9	24	7.3	1.33	0.41

Table 2-2 Stack Parameters for BART Eligible Units – Area Sources

Model ID	Unit Description	Coordinates				Base Elevation		Release Height		Easterly Length		Northerly Length		Angle from North	Vertical Dimension	
		UTM Easting (m)	UTM Northing (m)	LCC Easting (m)	LCC Northing (m)	(ft)	(m)	(ft)	(m)	(ft)	(m)	(ft)	(m)	(˚)	(ft)	(m)
80	Wood Yard	428537	3342859	315.426	-1077.580	23.0	7	0	0	930	283.5	750	228.6	0	0	0
81	Truck Traffic Fugitives	428133	3342750	315.025	-1077.707	24.9	7.6	3.3	1	100	30.5	100	30.5	0	0	0

Table 2-3 Emission Rates for All BART Eligible Units

Model ID	Unit Description	SO_2 Emission Rate			NO_x Emission Rate			PM_{10} Emission Rate			$PM_{2.5}$ Emission Rate		
		(lb/hr)	(g/s)	Basis	(lb/hr)	(g/s)	Basis	(lb/hr)	(g/s)	Basis	(lb/hr)	(g/s)	Basis
1A	No. 1 Recovery Furnace	344.5	43.4	CEMS	95	11.97	PA	59.62	7.512	EST[1]	59.62	7.512	EST[2]
1B	No. 2 Recovery Furnace	327.9	41.3	CEMS	95	11.97	PA	59.62	7.512	EST[1]	59.62	7.512	EST[2]
2	Bark Boiler	16.2	2.0412	PA	88.54	11.16	PA	37.42	4.715	PA	37.42	4.715	EST[2]
2A	No. 1 PFI Boiler	5	0.63	PA	49.83	6.28	PA	3	0.378	PA	3	0.378	EST[2]
3	No. 1 Dissolving Tank	0.35	0.0441	EST[1]	1.385	0.175	EST[1]	12.44	1.567	EST[1]	12.44	1.567	EST[2]
4	No. 1 Dissolving Tank	0.35	0.0441	EST[1]	1.385	0.175	EST[1]	12.44	1.567	EST[1]	12.44	1.567	EST[2]
9	Lime Silo	0	0		0	0		0.63	0.0794	PA	0.63	0.07938	EST[2]
10	No. 1 Lime Slaker	0	0		0	0		2	0.252	PA	2	0.252	EST[2]
11	Lime Kiln	7.04	0.88704	EST[1]	42	5.292	PA	31.58	3.98	EST[1]	31.58	3.979	EST[2]
13	No. 2 Slaker	0	0		0	0		2	0.252	PA	2	0.252	EST[2]
80	Wood Yard	0	0		0	0		1.740*	0.219	PA	1.740	0.219	EST[2]
81	Truck Traffic Fugitives	0	0		0	0		18.11	2.282	EST[1]	18.11	2.28186	EST[2]

PA Current permit allowable rate
CEMS Maximum 24-hour average emission rate from CEMS data
EST[1] Updated calculated rate based on rates in proposed PSD project (June 2007)
EST[2] Assumed same emission rate as PM10
* This source has a permitted annual emission rate only. The estimated 24-hour emission rate is 2X the annual rate.

3.0 First Stage Exemption Modeling (Using No-Obs Met)

The first stage of BART exemption modeling, as described in the previously submitted modeling protocol, includes the use of the preprocessed CALMET meteorological data set provided by CENRAP. This data set was processed with prognostic MM5 data only (in the No-Obs mode) and does not include observed meteorological data. All 20 Class 1 areas in the CENRAP southern region were included in the modeled domain:

Table 3-1 Class I Areas Included in First Stage of Exemption Modeling

Class I Area Abbreviation	Class 1 Area Name
BAND	Bandelier, NM
BIBE	Big Bend, TX
BOAP	Bosque del Apache, NM
BRET	Breton, LA
CACR	Caney Creek, AR
CAVE	Carlsbad Caverns, NM
GRSA	Great Sand Dunes, CO
GUMO	Guadalupe Mountains., TX
HEGL	Hercules-Glades, MO
LAGA	La Garita, CO
MEVE	Mesa Verde, CO
MING	Mingo, MO
PECO	Pecos, NM
SACR	Salt Creek, NM
SAPE	San Pedro Parks, NM
UPBU	Upper Buffalo, AR
WEMI	Weminuche, CO
WHIT	White Mountain Wilderness, NM
WHPE	Wheeler Peak, NM
WIMO	Wichita Mtns., OK

In order to ensure that the modeled results are conservative, due to the use of meteorological data processed in the No-Obs mode, the maximum highest impact (rather than the 98th percentile 8th high) was compared to the 0.5 dv contribution threshold. Table 3-2 lists the results of the first stage exemption modeling.

The highest modeled impact was 0.468, which was predicted for the 2002 calendar year at Wichita Mountains Wilderness. No additional refined modeling is required. Therefore the TIO Mill does not “contribute” to visibility impairment at any Class 1 area and is not subject to BART requirements.

Table 3-2 Modeled Impacts from the First Stage of Exemption Modeling

Class I Area	Maximum Modeled Visibility Impact (dv)			Max Impacts Over 0.5 (dv)?	No. of Days with Impacts > 0.5 dv		
	2001	2002	2003		2001	2002	2003
Bandelier, NM	0.025	0.066	0.026	-	0	0	0
Big Bend, TX	0.094	0.148	0.166	-	0	0	0
Bosque del Apache, NM	0.04	0.094	0.025	-	0	0	0
Breton, LA	0.312	0.319	0.573	(see below)	0	0	1
Breton, LA[1]			0.46	-			0
Caney Creek, AR	0.196	0.255	0.261	-	0	0	0
Carlsbad Caverns, NM	0.064	0.125	0.066	-	0	0	0
Great Sand Dunes, CO	0.007	0.109	0.025	-	0	0	0
Guadalupe Mtns., TX	0.063	0.132	0.072	-	0	0	0
Hercules-Glades, MO	0.208	0.268	0.181	-	0	0	0
La Garita, CO	0.004	0.043	0.016	-	0	0	0
Mesa Verde, CO	0.003	0.032	0.008	-	0	0	0
Mingo, MO	0.156	0.163	0.195	-	0	0	0
Pecos, NM	0.043	0.138	0.035	-	0	0	0
Salt Creek, NM	0.081	0.194	0.047	-	0	0	0
San Pedro Parks, NM	0.012	0.054	0.019	-	0	0	0
Upper Buffalo, AR	0.316	0.25	0.241	-	0	0	0
Weminuche, CO	0.005	0.042	0.016	-	0	0	0
White Mountain Wilderness, NM	0.059	0.101	0.034	-	0	0	0
Wheeler Peak, NM	0.019	0.145	0.03	-	0	0	0
Wichita Mtns., OK	0.535	0.468	0.226	(see below)	1	0	0
Wichita Mtns., OK[1]	0.32			-	0		

[1] Using model refinements with regard to particulate (section 2.1.1), Rayleigh scattering (section 2.1.2), and the new IMPROVE equation (section 2.1.3).

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Appendix A – Electronic Archive of Modeling Files

(DVDs and/or CDs attached)