



OCT - 2 2013



AIR PERMIT ROUTING/APPROVAL SLIP-Permits

AI No.	126578	Company	Shintech Louisiana LLC	Date Received	11/26/2012
Activity No.	PER20120020	Facility	Plaquemine Plant 2	Permit Type	
CDS No.	1280-00118	Permit No.	PSD-LA-731(M-1)	Expedited Permit	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no

1. Technical Review	Approved	Date rec'd	Date FW	Comments
Permit Writer	ALR	11/27/13	6/4/13	
Air Quality / Modeling				
Toxics				
Technical Advisor	Dan		6/20/13	
Supervisor				
Other				
2. Management Review (if PN req'd)	Approved	Date rec'd	Date FW	Comments
Supervisor	<i>[Signature]</i>		07/30/13	
Manager	<i>[Signature]</i>		7/31/13	
Assistant Secretary (PN)	<i>[Signature]</i>		7/31/13	
3. Response to Comments (if PN req'd)	Approved	Date rec'd	Date FW	Comments
Supervisor				
Manager				
Administrator				
Legal (BFD)				
4. Final Approval	Approved	Date rec'd	Date FW	Comments
Supervisor				
Manager	<i>[Signature]</i>		9/23/13	
Administrator				
Assistant Secretary	<i>[Signature]</i>		4/25/13	

PN of App needed	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no	Date of PN of App	11/29/12	Newspaper	The Advocate/Baton Rouge
Fee paid	<input type="checkbox"/> yes <input type="checkbox"/> no				
NSPS applies	<input type="checkbox"/> yes <input type="checkbox"/> no	PSD/NNSR applies	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no	NESHAP applies	<input type="checkbox"/> yes <input type="checkbox"/> no

2. Post-Technical Review					
Company technical review	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> n/a	E-mail date	7/15/13	Remarks received	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
Surveillance technical review	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> n/a	E-mail date	7/15/13	Remarks received	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no

3. Public Notice					
Public Notice Required	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no	PSD Mod			
Library	Iberville Parish Library				
PN newspaper 1/City	The Advocate/Baton Rouge	PN Date	8/8/13	EDMS	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
PN newspaper 2/City	Plaquemine Post-South / Plaquemine	PN Date	8/8/13	Verification	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
Company notification letter sent	Date mailed	8/6/13			
EPA PN notification e-mail sent	Date e-mailed	8/6/13			
OES PN mailout	Date	8/6/13			

4. Final Review				
Public comments received	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	EPA comments rec'd	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	Date EPA Resp. to Comments-mailed
Company comments received	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	PN info entered into Permit Sec VI	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no	Date EPA approved permit

Comments

BOBBY JINDAL
GOVERNOR



PEGGY M. HATCH
SECRETARY

State of Louisiana
DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL SERVICES

Certified Mail No. 7012 3460 0000 8286 3060

Agency Interest (AI) No. 126578
Activity No. PER20120020

Mr. David V. Wise
Plant Manager
Shintech Louisiana, LLC
PO Box 358
Addis, LA 70710-0358

RE: Prevention of Significant Deterioration (PSD) Permit, PSD-LA-731(M-1) Shintech Louisiana LLC - Plaquemine PVC Plant
Shintech Louisiana LLC, Plaquemine Iberville Parish, Louisiana

Dear Mr. Wise:

Enclosed is your permit, PSD-LA-731(M-1). Construction of the proposed project is not allowed until such time as the corresponding Part 70 Operating Permit is issued.

Please be advised that pursuant to provisions of the Environmental Quality Act and the Administrative Procedure Act, the Department may initiate review of a permit during its term. However, before it takes any action to modify, suspend or revoke a permit, the Department shall, in accordance with applicable statutes and regulations, notify the permittee by mail of the facts or operational conduct that warrant the intended action and provide the permittee with the opportunity to demonstrate compliance with all lawful requirements for the retention of the effective permit.

Should you have any questions, contact Anthony Randall of the Air Permits Division at (225) 219-3494.

Sincerely,

A handwritten signature in black ink, appearing to read "S. L. Phillips".

Sam L. Phillips
Assistant Secretary

September 25, 2013
Date

SLP:alr

c: US EPA Region VI

BRIEFING SHEET

Shintech Plaquemine Plant 2
Agency Interest No.: 126578
Shintech Louisiana LLC
Plaquemine, Iberville Parish, Louisiana
PSD-LA-731(M-1)

PURPOSE

To modify the permit limits of this permit to match those of the Title V permit modification for Shintech Plaquemine Plant 2.

RECOMMENDATION

Approval of the proposed construction and issuance of a permit.

REVIEWING AGENCY

Louisiana Department of Environmental Quality, Office of Environmental Services, Air Permits Division

PROJECT DESCRIPTION

Shintech Louisiana, LLC (Shintech) is proposing the Shintech Plaquemine Plant (SPP) expansion Project which will result in a 20% increase of vinyl chloride monomer (VCM) production rate and a new 35% HCl production line. The proposed SPP expansion project will affect all permits at the SPP facility and will also result in the addition of a new Title V Permit for Hydrochloric Acid Production Furnace 3 (HAPF-3).

Shintech is proposing to modify the permit limits of this permit to reflect the modifications made to the Shintech Plaquemine Plant 2 (SPP-2) facility due to the SPP expansion project.

Estimated emissions, in tons per year, are as follows:

Pollutant	Area Attainment Status	Project Increase from Expansion Project	Significance Threshold	Above Threshold?
PM _{2.5}	Attainment	+9.64	10	No
PM ₁₀	Attainment	+10.20	15	No
SO ₂	Attainment	+0.47	40	No
NO _x	Nonattainment	+10.40	40	No
CO	Attainment	+57.20	100	No
VOC*	Nonattainment	+12.78	40	No
CO _{2e}	Attainment	+118,383	75,000	Yes

*Precursor for ozone

BRIEFING SHEET

Shintech Plaquemine Plant 2
Agency Interest No.: 126578
Shintech Louisiana LLC
Plaquemine, Iberville Parish, Louisiana
PSD-LA-731(M-1)

TYPE OF REVIEW

Green House Gases(GHG) (CO₂e) emissions from the proposed major modification will be above PSD significance levels. Therefore, the requested permit was reviewed in accordance with PSD regulations for GHG emissions. Emissions of LAC 33:III.Chapter 51-regulated toxic air pollutants (TAP) have been reviewed pursuant to the requirements of the Louisiana Air Quality Regulations.

BEST AVAILABLE CONTROL TECHNOLOGY

Green house gas (GHG) emissions are above PSD significance levels and must undergo PSD analyses. The selection of control technology was based on the BACT analysis using a “top down” approach and included consideration of control of toxic materials.

Shintech has chosen to implement the following energy efficiency measures as BACT for CO₂e. In addition, Shintech will monitor fuel usage for each of the sources subject to BACT requirements for emissions of GHG. Further, Shintech will comply with the following proposed CO₂e emissions limits as BACT for emissions of GHG.

Shintech will institute improved combustion measures for Cracking Furnace E (EPN 2M-17). Improved combustion measures will consist of combustion tuning, optimization, and installation of instrumentation and controls according to the manufacturer’s specifications.

Shintech will ensure proper installation of insulation for Cracking Furnace E (EPN 2M-17) according to the manufacturer’s specifications.

Shintech will conduct operational monitoring as well as proper maintenance for Cracking Furnace E (EPN 2M-17) according to the manufacturer’s specifications in order to minimize air infiltration.

AIR QUALITY IMPACT ANALYSIS

Facilities that are subject to PSD review are required to conduct an ambient air quality impact analysis to demonstrate that major stationary sources and/or major modifications to major sources will not cause or contribute to a violation of any applicable NAAQS or PSD Increment.

This expansion project triggers PSD due to the proposed increase in CO₂e emissions. Air dispersion modeling is not required for CO₂e.

ADDITIONAL IMPACTS

Soils, vegetation, and visibility will not be adversely impacted by the proposed facility, nor will any Class I area be affected. The project will not result in any significant secondary growth effects. Approximately 200 new permanent jobs will be created.

BRIEFING SHEET

**Shintech Plaquemine Plant 2
Agency Interest No.: 126578
Shintech Louisiana LLC
Plaquemine, Iberville Parish, Louisiana
PSD-LA-731(M-1)**

PROCESSING TIME

Application Dated:	November 26, 2012
Application Received:	November 26, 2012
Additional Information Dated:	January 11, 2013, February 4, 2013, March 4, 2013, and April 19, 2013
Effective Completeness Date:	June 4, 2013

PUBLIC NOTICE

A notice requesting public comment on the permit was published in *The Advocate*, Baton Rouge, on August 8, 2013; and in the *Plaquemine Post-South*, Plaquemine, on August 8, 2013. A copy of the public notice was mailed to concerned citizens listed in the Office of Environmental Services Public Notice Mailing List on August 6, 2013. The draft permit was also submitted to US EPA Region VI on August 6, 2013. No comments were received.

PRELIMINARY DETERMINATION SUMMARY

Shintech Plaquemine Plant 2
Agency Interest No.: 126578
Shintech Louisiana LLC
Plaquemine Iberville Parish, Louisiana
PSD-LA-731(M-1)
June 4, 2013

I. APPLICANT

Shintech Louisiana LLC
PO Box 358
Addis, LA 707100358

II. LOCATION

Shintech Louisiana LLC – Shintech Plaquemine Plant 2 is located at 26270 Highway 405 River Road South, Plaquemine, Louisiana. Approximate UTM coordinates are 675.712 kilometers East and 3350.274 kilometers North, Zone 15.

III. PROJECT DESCRIPTION

Shintech Louisiana, LLC (Shintech) is proposing the Shintech Plaquemine Plant (SPP) expansion Project which will result in a 20% increase of vinyl chloride monomer (VCM) production rate and a new 35% HCl production line. The proposed SPP expansion project includes the construction of the Cracking Furnace E and the construction/modification of other equipment.

Green House Gasses (GHG) emissions from this project will be above the PSD significance level of 75,000 tons/yr. PSD Review is required for GHG emissions from the cracking furnace E. Other Emission will increase less than the significance levels; however, the PSD limits are revised to incorporate the increases.

Estimated emissions, in tons per year, are as follows:

Pollutant	Area Attainment Status	Project Increase from Expansion Project	Significance Threshold	Above Threshold?
PM _{2.5}	Attainment	+9.64	10	No
PM ₁₀	Attainment	+10.20	15	No
SO ₂	Attainment	+0.47	40	No
NO _x	Nonattainment	+10.40	40	No
CO	Attainment	+57.20	100	No
VOC	Nonattainment	+12.78	40	No
CO ₂ e	Attainment	+118,383	75,000	Yes

PRELIMINARY DETERMINATION SUMMARY

Shintech Plaquemine Plant 2
Agency Interest No.: 126578
Shintech Louisiana LLC
Plaquemine Iberville Parish, Louisiana
PSD-LA-731(M-1)
June 4, 2013

IV. SOURCE IMPACT ANALYSIS

A proposed net increase in the emission rate of a regulated pollutant above de minimis levels for new major or modified major stationary sources requires review under Prevention of Significant Deterioration regulations, 40 CFR 52.21. PSD review entails the following analyses:

- A. A determination of the Best Available Control Technology (BACT);
- B. An analysis of the existing air quality and a determination of whether or not preconstruction or postconstruction monitoring will be required;
- C. An analysis of the source's impact on total air quality to ensure compliance with the National Ambient Air Quality Standards (NAAQS);
- D. An analysis of the PSD increment consumption;
- E. An analysis of the source related growth impacts;
- F. An analysis of source related growth impacts on soils, vegetation, and visibility;
- G. A Class I Area impact analysis; and
- H. An analysis of the impact of toxic compound emissions.

A. BEST AVAILABLE CONTROL TECHNOLOGY

Under current PSD regulations, an analysis of "top down" BACT is required for the control of each regulated pollutant emitted from a modified major stationary in excess of the specified significant emission rates. The top down approach to the BACT process involves determining the most stringent control technique available for a similar or identical source. If it can be shown that this level of control is infeasible based on technical, environmental, energy, and/or cost considerations, then it is rejected and the next most stringent level of control is determined and similarly evaluated. This process continues until a control level is arrived at which cannot be eliminated for any technical, environmental, or economic reason. A technically feasible control strategy is one that has been demonstrated to function efficiently on identical or similar processes. Additionally, BACT shall not result in emissions of any pollutant which would exceed any applicable standard under 40 CFR Parts 60 and 61.

For this project, BACT analyses are required for CO₂e emissions from the facility.

BACT analyses for CO₂e

Cracking Furnace E EQT0233 (EPN 2M-17)

PRELIMINARY DETERMINATION SUMMARY

**Shintech Plaquemine Plant 2
Agency Interest No.: 126578
Shintech Louisiana LLC
Plaquemine Iberville Parish, Louisiana
PSD-LA-731(M-1)
June 4, 2013**

Carbon Capture and Sequestration

Shintech is currently proposing to permit approximately 118,383 tpy of CO₂e. The proposed CO₂ emissions generated from the Shintech Plaquemine Plant are primarily a product of combustion. Currently, the only potential add-on control technology available to reduce CO₂ emissions is Carbon Capture and Sequestration (CCS). CCS is composed of three components: CO₂ capture and compression, transport and storage, or injection into subsurface geologic formations. According to the EPA, CCS is available for facilities emitting large amounts of CO₂ including fossil fuel-fired power plants, cement production, and iron and steel manufacturing, as well as facilities with high purity CO₂ streams such as hydrogen production, natural gas processing and ethanol production. The Shintech Plaquemine Plant does not emit high-purity CO₂ streams and is therefore not technically feasible. However, due to the economic, energy, and legal issues discussed above, CCS is not considered a viable technology for BACT.

Improved Combustion Measures

There are a number of options for improving the combustion process and the overall performance of the furnace, minimizing emissions, and minimizing fuel usage. Examples include combustion tuning, optimization using parametric testing, and the installation of advanced digital instrumentation.

Reduced Carbon Fuel and Feedstock

By utilizing fuels with lower carbon contents, it is possible to reduce GHG emissions. Natural gas is used as fuel during startup to bring the furnace to operating temperature and is otherwise used as fuel to preheat the air used in the SCR. Natural gas has the lowest overall carbon intensity of any available fuel.

The SPP-1 and SPP-2 Plants produce a hazardous waste stream that is routed to this furnace as both a feedstock and a fuel. This hazardous waste stream is the primary fuel for this furnace during periods of normal operations. It is not technically feasible to exchange the use of natural gas for any other fuels with a lower carbon impact.

Insulation

Significant heat loss occurs through the shell of the combustion unit. Proper installation of insulation keeps these losses to a minimum and reduces the overall fuel use requirements. Insulation is categorized as either mass or reflective, depending on whether it is used to reduce conductive or radiative heat losses, accordingly.

Proper installation of refractory insulation keeps heat losses through the furnace shell to a minimum and reduces the overall fuel use requirements. Insulation is categorized as either mass or reflective, depending on whether it is used to reduce conductive or radiative heat losses, accordingly. This is a feasible option considering technological, economic, and environmental factors.

PRELIMINARY DETERMINATION SUMMARY

Shintech Plaquemine Plant 2
Agency Interest No.: 126578
Shintech Louisiana LLC
Plaquemine Iberville Parish, Louisiana
PSD-LA-731(M-1)
June 4, 2013

Air Preheating

By capturing and reusing the flue gas to preheat the combustion air, fuel usage requirements are reduced. Air preheat has the disadvantage of higher NO_x emissions due to increased flame temperature.

Use of an air preheater would result in an increase in thermal NO_x emissions due to higher combustion temperatures. The relatively cool inlet air will absorb heat from the unit, thereby keeping combustion temperatures lower than they would be otherwise. According to EPA use of an air preheater is not environmentally feasible

Minimization of Air Infiltration

As a large temperature differential exists between the furnace interior and ambient air, a negative pressure is created that promotes the infiltration of ambient air. Fuel is wastes heating this air, and by minimizing the infiltration of ambient air, fuel usage is lessened. Methods to reduce infiltration include good maintenance as well as operational monitoring.

Methods to reduce infiltration include good maintenance as well as operational monitoring. This is a feasible option considering technological, economic, and environmental factors.

Selection of CO₂e BACT

Shintech has chosen to implement the following energy efficiency measures as BACT for CO₂e. In addition, Shintech will monitor fuel usage for each of the sources subject to BACT requirements for emissions of GHG. Further, Shintech will comply with the following proposed CO₂e emissions limits as BACT for emissions of GHG.

Shintech will institute improved combustion measures for Cracking Furnace E (EPN 2M-17). Improved combustion measures will consist of combustion tuning, optimization, and installation of instrumentation and controls according to the manufacturer's specifications.

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Shintech will conduct operational monitoring as well as proper maintenance for Cracking Furnace E (EPN 2M-17) according to the manufacturer's specifications in order to minimize air infiltration.

B. ANALYSIS OF EXISTING AIR QUALITY

Facilities that are subject to PSD review are required to conduct an ambient air quality impact analysis to demonstrate that major stationary sources and/or major modifications

PRELIMINARY DETERMINATION SUMMARY

**Shintech Plaquemine Plant 2
Agency Interest No.: 126578
Shintech Louisiana LLC
Plaquemine Iberville Parish, Louisiana
PSD-LA-731(M-1)
June 4, 2013**

to major sources will not cause or contribute to a violation of any applicable NAAQS or PSD Increment.

This expansion project triggers PSD due to the proposed increase in CO₂e emissions. Air dispersion modeling is not required for CO₂e.

C. NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS) ANALYSIS

Refined modeling was not required.

D. PSD INCREMENT ANALYSIS

Computer modeling was not required.

E. SOURCE RELATED GROWTH IMPACTS

Operation of this facility is not expected to have any significant effect on residential growth or industrial/commercial development in the area of the facility. No significant net change in employment, population, or housing will be associated with the project. As a result, there will not be any significant increases in pollutant emissions indirectly associated with Shintech Louisiana LLC's proposal. Secondary growth effects will include temporary construction related jobs and approximately 200 permanent jobs.

F. SOILS, VEGETATION, AND VISIBILITY IMPACTS

There will be no significant impact on area soils, vegetation, or visibility.

G. CLASS I AREA IMPACTS

Louisiana's Breton Wildlife Refuge, the nearest Class I area, is over 100 kilometers from the site, precluding any significant impact.

H. TOXIC EMISSIONS IMPACT

The selection of control technology based on the BACT analysis included consideration of control of toxic emissions.

V. CONCLUSION

The Air Permits Division has made a preliminary determination to approve the construction of the facility at the Shintech Louisiana LLC - Plaquemine PVC Plant near Plaquemine in Iberville Parish, Louisiana, subject to the attached specific and general conditions listed in LAC 33:III.537. In the event of a discrepancy in the provisions found in the application and those in this Preliminary Determination Summary, the Preliminary Determination Summary shall prevail.

SPECIFIC CONDITIONS

**Shintech Plaquemine Plant 2
Agency Interest No.: 126578
Shintech Louisiana LLC
Plaquemine Iberville Parish, Louisiana
PSD-LA-731(M-1)**

1. Comply with the Louisiana General Conditions as set forth in LAC 33:III.537. [LAC 33:III.537]
2. The permittee is authorized to operate in conformity with the specifications submitted to the Louisiana Department of Environmental Quality (LDEQ) as analyzed in LDEQ's document entitled "Preliminary Determination Summary" dated February 29, 2008, and subject to the following emissions limitations and other specified conditions. Specifications submitted are contained in the application and Emission Inventory Questionnaire dated November 14, 2007, along with supplemental information dated February 12, 2008 and February 27, 2008.

ID No.	Description		PM ₁₀	NO _x	CO
EQT0112 and EQT0113	2U-1 Utility Boilers & 2U-2 Utility Boilers	lb/MM Btu lb/hr TPY	0.005 1.25 5.48	0.01 3.05 11.13	0.0362 10.86 39.64
EQT0120	2C-4 Cooling Tower	lb/M Gal lb/hr TPY	0.00008 0.22 0.81	-	-
EQT0128	2M-7 Cooling Tower	lb/M Gal lb/hr TPY	0.00006 0.46 1.67	-	-
EQT0122, EQT0123, EQT0124, and EQT0125	2M-1, 2M-2, 2M-3, & 2M- 4 – VCM Cracking Furnaces	lb/MM Btu lb/hr TPY	0.007 0.80 2.94	0.009 0.96 3.50	0.046 5.00 18.26
EQT0126 and EQT0127	2M-5 & 2M-6 – Gas Thermal Oxidizers	lb/MM Btu lb/hr TPY	0.0077 0.55 2.43	0.02 1.40 6.15	0.08 6.10 26.74
EQT0115, EQT0116, EQT0121, and EQT0129	2U-5, 2U-6, 2C-6, and 2M- 11 – Diesel Fired Emergency Engines	lb/HP-hr (<600 HP) (>600 HP)	0.0022 0.0007	-	0.0067 0.0055
FUG0006	2U-4 Fugitive Emissions	lb/hr TPY	-	-	-
FUG0008	2M-8 Fugitive Emissions	lb/hr TPY	-	-	-
FUG0009	2M-9 Fugitive Emissions	lb/hr TPY	-	-	-
FUG0010	2M-10 Fugitive Emissions	lb/hr TPY	-	-	-

SPECIFIC CONDITIONS

Shintech Plaquemine Plant 2
Agency Interest No.: 126578
Shintech Louisiana LLC
Plaquemine Iberville Parish, Louisiana
PSD-LA-731(M-1)

3. The permittee is authorized to operate in conformity with the specifications submitted to the Louisiana Department of Environmental Quality (LDEQ) as analyzed in LDEQ's document entitled "Preliminary Determination Summary" dated May 14, 2013, and subject to the following emissions limitations and other specified conditions. Specifications submitted are contained in the application and Emission Inventory Questionnaire dated November 26, 2012, along with supplemental information dated January 11, 2013.

MAXIMUM ALLOWABLE EMISSIONS RATES			
ID No.	Description		CO ₂ e
EQT0233	Cracking Furnaces E (2M-17)	TPY	46,123

