Clean Condensate Alternative Key Permitting Elements -06/12/06

The following key elements of the "Side by Side" comparison for MACT I High Volume Low Concentration (HVLC) versus MACT I Clean Condensate Alternative (CCA), have been consolidated into this summary memo for inclusion in the Pensacola Title V Permit as an outline of Initial and Continuous Compliance requirements and demonstration approach.

The Pensacola Mill's Clean Condensate Alternative approach has evolved since early CCA proposals in mid 2003, to include an automated emissions accounting inventory or "bank" system that will allow both the mill and regulatory agency to evaluate compliance status over a wide range of production scenarios and treatment system functionalities.

The Continuous Monitoring System (CMS) and Initial Performance Test have been revised to allow more detailed compliance calculations to be made under a variety of operating scenarios ranging from the current mill profile to the corporation's proposed profile of the facility as a hybrid bleached/brown pulp production facility and, to accommodate a wide range of severe weather and mill upset impacts to the Wastewater Treatment Plant (WWTP). The revised CMS allows seamless calculation of emissions reductions (credits) against HVLC emission debits calculations regardless of the combinations of operating scenarios used at the facility in any given timeframe.

The final credit/debit compliance calculation is proposed to be calculated in tandem with the 15-day rolling period currently used for MACT I Phase I Condensate Collection and under the existing MACT I Phase II CCA agreement referenced in the facility's draft Title V permit. The final CMS includes new capabilities to continuously monitor all major project components that can impact emission credits and debits. The new system has been trialed in parallel with the original monitoring system approach for approximately 3 months and has been demonstrated to provide far more detail in support of the compliance demonstration.

The original 2004 proposal relied on an annualized comparison of credits and debits based on estimated process production in conjunction with individual equipment targets, but did not provide for daily calculations of actual emissions debits and credits from each project component on a continuous basis.

The mill completed a 15 day Initial Performance Test (IPT) on the CCA system starting in mid-January 2006. The results demonstrated significant emissions reduction safety margin over the base case HVLC emission. The IPT results and Notice of Compliance Status (NOCS) were submitted to the FL-DEP prior to the 60-day reporting deadline of March 31, 2006. Updated emissions factors based on the final WWTP design and IPT test data (based on EPA's Water 9 Model), were entered into the Proficy system.

MACT I Phase II Requirements-(CCA) - §63.440 Applicability

§63.440(d)(1) Each kraft pulping system shall achieve compliance with the pulping system provisions of §63.443 for the equipment listed in §63.443 (a)(1)(ii) through (a)(1)(v) as expeditiously as practicable, but in no event later than April 17, 2006, and the owners and operators shall establish dates, update dates and report the dates for the milestones specified in §63.455(b)

§ 63.447 Clean Condensate Alternative

As an alternative to the requirements specified in §63.443 (a)(1)(ii) through (a)(1)(v) for the control of HAP emissions from the pulping systems using the kraft process, an owner or operator must demonstrate to the satisfaction of the Administrator, by meeting all the requirements in § 63.447 (a) through (h), that the total HAP emissions reductions achieved by this clean condensate alternative technology are equal or greater than the total HAP emissions reductions that would have been achieved by compliance with §63.443 (a)(1)(ii) through (a)(1)(v).

The CCA Proposal that Pensacola Mill commits to comply with for MACT I Phase II §63.443 utilizing the § 63.447 Clean Condensate Alternative is as follows

1) **CCA Compliance CMS Commitment #1 – CCA Emission Reduction Credits will be equal or greater than the HVLC Emission Debits as calculated by an automated, continuous CCA Credit-to-HVLC Debit accounting system.**
   - **a.** Credits and Debits will be monitored daily and accrued on a 15-day rolling total for compliance comparison.
   - **b.** Credits and Debits will be based on source specific established emission factors, continuous unit production, and/or other process through-put measurements, in addition, to any activity which significantly impacts credits or debits (such as treatment system failures/diverts).
   - **c.** Any 15-day rolling total negative Credit to Debit value will be recorded as a period of excess emissions.
   - **d.** Each 15-day rolling total resulting in a negative credit value will result in one full day (24hrs) of excess emissions.
   - **e.** While HVLC allows a 4% downtime allowance for excess emissions, no excess emissions allowance percent is requested, however, start-up, shutdown, and malfunction provisions apply.
   - **f.** Reporting will be on a semi-annual basis and will include detailed operations, Trouble/Cause/Correction (TCC) responses for all periods of SSM or non-SSM related excess emissions events.

2) **CCA Compliance CMS Commitment #2 – Automated Calculation Of The MACT I Phase I Condensate Collection Requirement -** The Facility proposes that the MACT I Phase I requirement be calculated by prorating the applicable mass standard for bleached and unbleached pulp products (11.1 LB/ODTP and 7.2 LB/ODTP, respectively), by the ratio of tons of bleached and unbleached ODTP based on a 15-day rolling average.[1]

Example: For 1300 ODTP/Day Production at Varied Bleached/Brown Ratios

Scenario	Bleached-Pulp		Brown-Pulp		Calculated MACT-I Requirement LB/ODTP
	ODTP/Day	% Total	ODTP/Day	% Total	
1	1300	100%	0	0%	11.1
2	1000	76.92%	300	23.07%	10.2
3	650	50%	650	50%	9.15
4	300	23.07%	1000	76.92%	8.1
5	0	0%	1300	100%	7.2

[1] Note- This language is taken from Condition O.5 of the Georgia Pacific, Palatka Facility's Title V Permit Rev. 1070005-029-AV.

Detailed Example Calculations

$$\text{Scenario 2}: \left(\frac{1000}{1300}\times 11.1\right)+\left(\frac{300}{1300}\times 7.2\right)=10.2$$

$$\text{Scenario 4}: \left(\frac{300}{1300}\times 11.1\right)+\left(\frac{1000}{1300}\times 7.2\right)=8.1$$

3) **CCA EMISSION REDUCTION PROJECTS- The Following Projects are Part of the Clean Condensate Alternative Compliance System. The Premise for the Emissions Reduction of Each Project is Included:**

a. **WWTP Emission Reduction Projects:**

i. **Reduce Methanol Loading to the WWTP** by increasing over-collection of methanol to the No.2 Steam Stripper beyond the MACT I Phase I required 11.1 LB/ODTP. Net volatilization will be reduced, as less methanol enters the large surface area of the WWTP.

ii. **Reduce WWTP Surface Area Available for Methanol Volatilization**

1. **Install Twin Primary Clarifiers -** To replace the large surface area 11-Acre Settling Basin as the primary means to remove solids. The Primary Clarifiers are approximately 1-Acre (0.5 Acres each), reducing surface area exposure by 10-Acres under normal operating conditions. The distance from the entrance of the Mill Ditch to the Primary Clarifiers will be shorter and the channels that transport the flow into the clarifiers will be more narrow than the original mill ditch to the 11Acre MSB. The primary transport ditch to the new PC system will therefore have less surface area for volatilization to occur. **(This Project Is Construction Complete And In Service)**

2. **Minimize to the Extent Possible, the Use of the 11-Acre-Multi-purpose Surge Basin (MSB) -** For emergency spills, operational upsets, maintenance, and/or storm surge events. Lower emissions reductions credits are available during periods of MSB utilization. The original mill ditch which is longer and wider than the new transport ditch, must be used if flow is diverted before the PCs to the MSB. A higher emission factor is used for the larger ditch during these divert occurrences. Flow can also divert to the MSB after it travels through the PCs, however, this connection is a closed culvert. The distance from the MSB Outlet to the ASB1, or from the PCs to the ASB1 is approximately the same distance, so the volatilization for this leg of the flow pattern is the same in Proficy. **(Proficy is designed to track divert gate status both before and after the PCs to determine the flow path and subsequent volatilization pattern and mass emissions).**

b. **Install a New Mill Water Slaker Scrubber-(to replace the original green liquor slaker scrubber, which will reduce methanol stripping associated with methanol content in the green liquor).** Methanol emissions test data was collected both before and after the original scrubber was replaced. The calculation assumes that the full emissions reduction is achieved as methanol is scrubbed from the vent to the sewer using mill water in the new scrubber. Water 9 calculations were used to determine the percent of methanol going into the sewer that would revolatilize in the WWTP system instead of being biodegraded. The revolatilization is

subtracted from the net slaker credit before it is added to the total credit bank. These calculations are executed in the mill's Proficy system on a daily basis rolled into 15 day totals. **(The Slaker Scrubber project is complete, in operation and is being monitored in Proficy).**

c. **If deemed necessary for Project Onyx, the Facility may need to install Low Air Infiltration Brownstock Washer Hoods on the No.1 and/or No.2 HWD, 3-Drum BSW Lines, should additional emissions Reductions Credits be required to maintain a Positive Credit Balance under the Onyx Operating Conditions.** If new low flow BSW Hoods are required for the Onyx project, their emission vents will be retested to establish new emission factors to input into the CMS Proficy HVLC debit calculations based on BSW daily production throughput. Installation of the hoods indirectly increases the credit margin, by reducing the HVLC debit (BSW HVLC emissions to atmosphere will be directly reduced with hood installation). As of April 17, 2006, the IPT testing and evaluation demonstrated that the low flow hoods were not needed. However, future mill modifications could change the credit/debit relationship and the hoods may be needed at some point. The mill's Proficy system will be programmed to add in the appropriate factor for the BSW hood credit if needed in the future.

4) **Continuous Monitoring System – Credit/Debit Bank – Daily calculations will document lb/day methanol emissions by the HVLC system based on 2003 air test data developed lb/ODTP emission factors.** While very detailed calculations are shown step by step in Proficy on a daily and 15-day rolling basis, the simplified concept is shown here for reference using only a daily calculation. The following tables illustrate the HVLC Debit calculations and WWTP Credit calculations.

HVLC Debits, Calculation Example:

Source or Line	ODTP/Day	MeOH LB/ODTP	MeOH-Emitted LB/Day
SWD Kamyr System	800	0.014	11.2
SWD O2 System	800	0.296	236.8
HWD -1BSW System	250	0.86	215
HWD- 2BSW System	250	0.86	215
HWD O2 System	500	0.304	152
HVLC Gross Total			830.5
MACT HVLC Required Control (Debit)[2]			813.9

*** This is an example and not representative of specific permit limit values**

General Premise For WWTP Emissions Reductions - **Primary Clarifiers** -The EPA Water 9 Model and 40CFR 63 Appendix C Forms (where appropriate), using mill specific methanol test data, documented a net methanol volatilization rate for each of the facility's current and future wastewater treatment system components (pre and post Primary Clarifier install).

Below is a table representing the different WWTP emissions profiles that are possible under the baseline condition, and under the future WWTP arrangement. The emissions difference between the baseline and future operating scenarios represents the available emissions reduction credit:

[2] Required control of 98% (98% x 1260 = 1234.8)

WWTP Credits, Calculation Example:

- **1300 ODTP/Day Bleached Pulp Production (800SWD/500HWD)**
- **26.5 LB/ODTP or 34,450 LB/Day-Total Condensate Methanol; (the 26.5 LB/ODTP is the mill historical average methanol inventory or: (11.1 +15.4 =26.5 LB/ODTP))**
  - **11.1 LB/ODTP or 14,430 LB/Day: Minimum Methanol to No.2SS for MACT I Compliance**
  - **15.4 LB/ODTP or 20,020 LB/Day: Methanol to WWTP (Starting at the Open Ditch)**
- **In the future the facility will shift more methanol to the No.2SS from WWTP.**
- **The Example shows the WWTP Inlet being reduced from 20,020 LB/Day to 17,550 LB/Day.**

	WWTP-(Baseline) Flow Path	**Future (Normal) WWTP-Flow Path**	**Future (Primary) Bypass Flow Path**	**Future-(Secondary) Bypass Flow Path**
Methanol Fed To WWTP LB/Day	20,020	17,550	17,550	17,550
Water9Air Emission #1	Old Ditch-2.9%	New Ditch-1.01%	New Ditch-1.01%	Old Ditch-2.9%
Water9Air Emission #2	11Acre-S.B.10.6%	Primary Clarifiers-2.15%	PrimaryClarifiers-2.15%	11-AcreS.B./MSB 10.6%
Water9Air Emission #3	Inlet Ditch+ASB1-12.17%	Inlet Ditch+ASB1-12.17%	11-Acre S.B./MSB 10.6%	Inlet Ditch+ASB1-12.17%
Water9Air Emission #4			Inlet Ditch+ASB1-12.17%	
Water9 Net Total % Of Inlet Load Emitted	20.01%	14.93%	23.94%	23.75%
Water9-Total-MeOH LB/Day Air Emission	4006	2620	4202	4169
CCA-WWTP MeOH-Benefit From-Baseline LB/Day	Reduced Emission>	**1387 Normal-WWTP Credit**	-196 Under Primary Bypass Condition	-162 Under Secondary Bypass Condition

***This is an example and not representative of specific permit limit values. Note that greater WWTP volatilization reductions are achieved by 1) reducing overall surface area (PC installation), and 2) by reducing net methanol load into the WWTP (by increasing methanol into No.2SS).**

Credit/Debit Bank, Calculation Example:

Credit/Debit Bank	**Baseline WWTP Emission, LB/Day**	**CCA WWTP Emission, LB/Day**	**CCA Net MeOH Credit LB/Day**
CCA WWTP Credit	**4006**	**2620**	**+1387**
Slaker Credit	**91**	**23**	**+68**
Total MACT CCA Credits			**+1455**
HVLC 98%Debit			**-814**
CCA Daily Ledger			**+641**

5) **Initial Performance Test –Primary Clarifiers –Following installation and start-up of the Primary Clarifiers, and within 180 days of the April 17, 2006 compliance date, the mill will test** methanol values into and out of the ASB over 15 days to confirm the impact of methanol shift from the mass that was previously emitted from the 11-Acre Settling Basin to that biologically treated in the ASB1. The Water 9 and Appendix C emissions profile of ASB1 will be reviewed to confirm that the mill's 15-day credit/debit ratio is not negative over the 15-day period when compared with the HVLC emissions over the same period**. (The IPT was**

completed starting January 16 through January 31, 2006 and provided a successful compliance demonstration).

a. **CMS Application**–The owner or operator shall monitor that the methanol containing wastewaters are flowing through the new Primary Clarifier System, by monitoring:
   i. Minutes/day of valve or gate position/status from the Open Ditch to the: MSB or Primary Clarifier Inlet
   ii. Minutes/day of valve or gate position/status from the Primary Clarifier Outlet to either: The MSB or ASB1.
   iii. Any diversion of methanol-containing wastewaters into the Multipurpose-Surge Basin (MSB) will be calculated as a mass emission to atmosphere and will reduce the value of the maximum daily WWTP credit available.

6) **Initial Performance Test –Slaker Scrubber –Following installation and start-up of the new Mill Water Slaker Scrubber, and within 180 days of the April 17, 2006 compliance date,** the mill will test methanol values out of the scrubber to determine methanol emission reductions compared with 3Q03 Weston Solutions test data collected from the original Green Liquor Slaker Scrubber. Operating parameters shall be set at the time of the test and will include scrubber mill water flow and scrubber water temperature.
   a. **CMS Application**- The emissions reduction factor resulting from the IPT will be entered into the CMS and applied for all minutes of operation that the scrubber maintains the same scrubber mill water flow and temperature maintained during the IPT. No emissions reductions (credits) will be accrued during minutes of operation not meeting the scrubber water flow and temperature conditions set during the IPT. **(The Slaker Scrubber IPT was completed January 16 through January 31, 2006 and provided a successful demonstration of methanol removal. The emission factors and calculations were updated in Proficy to reflect the IPT results).**

Notes:

1) **40 CFR 63.453(g) through (g)(3)-MACT I Phase I Steam Stripper Continuous Monitoring Requirements Applicable To CCA** –- The No.2 Steam Stripper shall be operated in accordance with MACT I Phase I requirements and will continue to collect 11.1lb/ODTP of methanol on a 15-day rolling average and will maintain a 92% or greater methanol removal. Effective steam ratio will be monitored continuously according to procedures outlined in the facility's approved alternate monitoring plan the No.2 Steam Stripper. The CMS will document any 3-Hour Rolling Average effective steam ratio that correlates to a 3-hour rolling average treatment efficiency below 92%. The CMS will document any period of downtime or effective steam ratio failure that exceeds the 10% semi-annual allowance as a period of unallowable excess emissions.
2) **The mill will continue to collect a daily composite of the condensate feed to the No.2 Steam Stripper to determine the total methanol collected both for MACT I Phase I and Phase II CCA calculations.** The sample(s) will be analyzed at a certified laboratory and the results applied to the methanol lb/ODTP calculations **(**Note: The approach and control logic are unchanged from the initial April 2002 MACT I Phase I compliance date).
3) **General Clean Condensate Alternative Equivalence**- Initial proposal emissions comparisons were based on lb/ODTP and ODUBTP/Yr based on an annualized mill production basis of 1310 ODTP/day or (1310 ODTP/day*365 days/yr=478150 ODUBTP/yr). The daily CMS will apply actual LB/ODTP emission factors based on site specific testing multiplied by actual line production to yield actual LB/Day methanol emissions credits and debits.
4) **April 8, 2004 Clean Condensate Alternative Guidance Document Commitment Regarding Additional Named Stream Condensate Collection** -The owner or operator will commit to collect additional condensate margin required to justify the averaging period.
5) **The HVLC Debits** will be calculated using the Weston Solutions Inc. source specific emissions data collected in July/August 2003 HVLC/CCA Scoping Study**.**

6) **The CCA Credits** will be based on daily WWTP operating status, No.2 Steam Stripper methanol over-collection and operating status, Slaker Scrubber utilization with fresh water and BSW hood installation (the latter, only if needed).
7) **Water9 Emissions Take Into Account: D**ownstream impacts to the ASB biological system, as well as periods when the CCA over-collection is returned to the sewer during periods of No.2 Steam Stripper Downtime. No CCA emission reductions are being claimed for any volatilization differences resulting from current or future upgrades of the Aerated Stablization Basins (ASB1 or ASB2).
8) **General Premise For WWTP Emissions Reductions** - **Primary Clarifiers** -The EPA Water 9 Model and 40CFR 63 Appendix C Forms (where appropriate), using mill specific methanol test data, were used to document the`net methanol volatilization rate for each of the facility's current and future wastewater treatment system components. The emissions difference between the baseline and future operating scenarios represents the available emissions reduction credit:

PENSACOLA MILL CLEAN CONDENSATE ALTERNATIVE - Continuous Monitoring System-Proficy Simulation

CMS With 15 Day Rolling Totals, Future Dirty Scenarios Can Be Simulated

Model Update 06/08/06

Date/Time	19-Mar 07:00	20-Mar 07:00	21-Mar 07:00	22-Mar 07:00	23-Mar 07:00	24-Mar 07:00	25-Mar 07:00	26-Mar 07:00	27-Mar 07:00	28-Mar 07:00	29-Mar 07:00	30-Mar 07:00	31-Mar 07:00	1-Apr 07:00	2-Apr 07:00	3-Apr 07:00	4-Apr 07:00	5-Apr 07:00	6-Apr 07:00	7-Apr 07:00	8-Apr 07:00	9-Apr 07:00	10-Apr 07:00	11-Apr 07:00	12-Apr 07:00	13-Apr 07:00	14-Apr 07:00	15-Apr 07:00	16-Apr 07:00	17-Apr 07:00	18-Apr 07:00	19-Apr 07:00	20-Apr 07:00	21-Apr 07:00	22-Apr 07:00	23-Apr 07:00	24-Apr 07:00	25-Apr 07:00	26-Apr 07:00	27-Apr 07:00	28-Apr 07:00	29-Apr 07:00	30-Apr 07:00
MB Day	19-Mar 06	19-Mar 06	20-Mar 06	21-Mar 06	22-Mar 06	23-Mar 06	24-Mar 06	25-Mar 06	26-Mar 06	27-Mar 06	28-Mar 06	29-Mar 06	30-Mar 06	31-Mar 06	1-Apr 06	2-Apr 06	3-Apr 06	4-Apr 06	5-Apr 06	6-Apr 06	7-Apr 06	8-Apr 06	9-Apr 06	10-Apr 06	11-Apr 06	12-Apr 06	13-Apr 06	14-Apr 06	15-Apr 06	16-Apr 06	17-Apr 06	18-Apr 06	19-Apr 06	20-Apr 06	21-Apr 06	22-Apr 06	23-Apr 06	24-Apr 06	25-Apr 06	26-Apr 06	27-Apr 06	28-Apr 06	29-Apr 06	30-Apr 06
	<15 dbvg	<15 dbvg	<15 dbvg