Teresa

TAMPA ELECTRIC

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SEP 22 2011
DIVISION OF AIR
RESOURCE MANAGEMENT

September 21, 2011

Jeffery F. Koerner, Program Administrator
Florida Department of Environmental Protection
Division of Air Resource Management
Office of Air Permitting and Compliance
2600 Blair Stone Road, M.S. 5505
Tallahassee, Florida 32399-2400

Via FedEx
Airbill No. 7952 1128 4879

Re: Tampa Electric Company - Big Bend Station
Title V Permit Number 0570039-045-AV
Cooling Tower Correction Response

Dear Mr. Koerner:

Tampa Electric Company (TEC) submitted certified engineering calculations to the Department on August 10, 2011 to demonstrate that the existing cooling towers and the upgraded Unit 2 cooling tower are insignificant sources of emissions. Based on the site specific data, TEC believes the previous calculations are correct and provide reasonable assurance of meeting the exemption requirements in Rule 62-210 F.A.C.

TEC is submitting responses to the EPC memorandum, dated September 1, 2011. As discussed on September 15, 2011, TEC is also submitting calculations and backup data for the upgraded cooling tower. TEC's responses to the memorandum are discussed below.

EPC Comment 1
The correspondence provided calculations for PM emissions based exclusively on the multiplication of drift rate, Total Dissolved Solids (TDS), and water circulation rate. There was no indication as to how the TDS value of 2,150 ppm used in the calculations was determined. This value is significantly lower than the mean values from Table 13.4-2 from AP-42. The TDS values for these cooling towers should be based on source-specific data from the site, and a lab analysis of the water samples should be included with any correspondence relating to emissions from the cooling towers. In addition, the drift rate was estimated at 0.005%. While modern drift eliminators have documented drift rates equal to and exceeding this value, drift eliminators from the past often performed at much lower levels. For example, the emission factors from AP-42 were derived from test results on various cooling towers where the arithmetic average for drift rate was 0.02% and TDS was approximately 12,000 ppm. Since the cooling towers at TEC are 25-40 years old, better explanation and evaluation of how the drift rate was estimated should be provided.

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TEC Response 1
The previous calculations used site specific data and vendor information to calculate the PM/PM_{10} emissions. The drift rate of 0.005% was recommended by the local Marley Representative, RME Associates, Inc., due the series of upgrades over the past 25 to 40 years. The concentration of 2,150 mg/L total dissolved solids (TDS) was provided by TEC's engineering department.

The AP-42 emission estimates provided by the EPC tend to grossly over estimate emissions. The current AP-42 drift rate suggested for induced draft cooling towers is 0.02%. This drift rate was commonly used during the 1970's to estimate emissions from wet cooling towers. TEC does not believe this drift rate is representative of the existing cooling towers at Big Bend. AP-42 also recommends using a TDS concentration of 12,000 mg/L. Again, this value is not representative and should not be used to estimate emissions from the existing cooling towers.

Review of the maintenance records show the mist eliminators were upgraded to Brentwood Industries Model XF150MAX on Units 1 to 3 cooling towers. These mist eliminators were designed for a drift rate of 0.001%. The maintenance records did not show any upgrades to the Unit 4 cooling tower. The original vendor specifications show a guaranteed drift flow rate of 0.5 gpm. Based on the recirculation flow of 6,500 gpm, the drift rate is estimated at 0.0077%. The vendor specification sheet of the mist eliminator (XF150MAX) is attached.

The existing cooling towers use makeup supply water from the Sun City reclaimed water system. TEC collected and analyzed the reclaimed water effluent on May 10 and 24, 2011. The results show the TDS in the reclaimed water ranged from 611 to 613 mg/L. Based on the analytical data and 3.5 cycles of concentration, the TDS concentration in the cooling tower is estimated at 2,150 mg/L. The laboratory analyses of the reclaimed water effluent are attached.

EPC Comment 2
The correspondence did not indicate whether the cooling towers are counter flow or cross flow, which should be supplied for completeness and could provide a better indication on the TDS level of water processed by the units.

TEC Response 2
The existing cooling towers operate with a cross flow configuration. The upgraded unit 2 cooling tower will be designed to operate with a cross flow configuration.

EPC Comment 3
The particulate matter emissions were estimated at approximately 1.5 ton/yr for each of the larger cooling towers. PM_{10} emissions were estimated to be approximately 61% of total PM emissions based on a procedure derived in an Abstract from Reisman and Frisbie entitled Calculating Realistic PM_{10} Emissions from Cooling Towers. To the best of my knowledge, use of this method for calculating PM_{10} emissions has not been published through any formal emission factor clearinghouse. In addition, the abstract did not indicate whether the results were validated through actual particle profile testing from the outlet of cooling towers, and the method makes

the general assumption that all solids remaining after a water droplet evaporates coalesce and form a single, solid, spherical particle. Use of this method should be evaluated to ensure it accurately reflects PM_{10} emissions. Finally, when using the emission factors from Table 13.4-1 from AP-42 and the process data provided in the correspondence, the PM_{10} emissions were estimated to be approximately 30 ton/yr for each of the larger cooling towers. While the emission factors from the table were developed using process parameters that appear higher than TEC's cooling towers, the results are nevertheless significantly higher. Since TEC has requested that the units be considered insignificant with potential emissions < 5 ton/yr, each unit's PTE should be confirmed.

TEC Response 3
The revised calculation procedure by Riesman and Frisbee (2001) is a widely accepted methodology to calculate PM/PM_{10} emissions. The Department has accepted this procedure on several air permit applications including, but not limited to the following projects:

Gainesville Renewable Energy Center (GREC) biomass power project	0010131-001-AC
OUC Stanton Unit B project	0950137-020-AC
FPL West County Energy Center	0990646-002-AC
Turkey Nuclear Plant Units 6 and 7	025000-013-AC
Big Bend Carbon Capture Project	0570039-047-AC
Treasure Coast Energy Center	1110121-001-AC
Hillsborough Resource Recovery Facility Expansion	0570261-008-AC
Crystal River Unit 3	0170004-018-AC
Crystal River Cooling Towers	0170004-010-AC
Levy Nuclear Plant Permit, Unit 1 and 2 Cooling Tower Project	0750088-001-AC
Taylor Energy Center	1230052-001-AC
Cane Island Power Park	0970043-014-AC

Environmental Systems Corporation conducted the particle size distribution tests at the Electric Power Research Institute (EPRI) test facility in Houston, Texas in 1988. The tests were conducted to measure the actual water droplet size distributions from a cooling tower with a test drift rate of 0.0003%. Riesman and Frisbee (2001) procedure uses site specific data and the test data from the study to calculate a new particle size distribution and PM/PM_{10} emissions profile. TEC believes the aforementioned methodology provides a more realistic estimate of emissions from modern cooling towers.

EPC Comment 4
TEC indicated that each of the 5 cooling towers is scheduled for replacement "in-kind" within the next 5 years, starting in October 2011. The new units will be of fiberglass construction, which is believed to be different from the existing units, and will contain new mist eliminators. Since the new cooling towers do not appear to be identical, submittal of emission estimates for each new cooling tower prior to construction should be provided to determine whether they can be

categorized as insignificant emission units or regulated emission units, which would require processing of a construction permit prior to installation.

TEC Response 4

The upgraded cooling tower is considered a "like-for-like replacement." This means the upgraded cooling tower under similar conditions will maintain the minimum characteristics and functionalities of the original or current installation. The Midwest Towers, Inc., the cooling tower vendor, indicated the upgraded cooling tower is designed for a guaranteed drift rate of 0.005%, but could be designed to 0.0005%. The upgraded recirculation rate and TDS concentrations are identical to the existing cooling tower. The vendor drift rate guarantee is attached.

The design variations will maintain the characteristics and functionalities of the current cooling tower. The material upgrade to fiberglass will provide increased longevity and reliability in the meeting the design conditions and emission guarantees. The cooling tower will be designed to the meet the current wind loading requirements set forth in the Florida Building Code. The upgraded installation consists of an integrated fill/drift eliminator combination instead of the standard segregated fill and drift eliminator configuration. The integration combination provides the synergies of the increasing air to gas ratio while minimizing mist entrainment.

Existing Cooling Towers

At the request of the EPC, TEC revised the calculations with additional site specific information to estimate emissions. The AP-42 procedure (Chapter 13.4 Wet Cooling Towers, latest Ed.) was used to calculate the PM emissions for each cooling tower. The revised procedure by Reisman and Frisbie (2001)[1] was used to calculate PM_{10} emissions. The calculations demonstrate the PM emissions from each cooling tower are less than the 5.0 tons per year threshold. Consequently, each cooling tower is considered an insignificant source of emissions. The emission calculations are summarized in Table 1. Emission calculations of the existing cooling towers are attached.

Table 1 –Existing Cooling Tower Emission Summary.

Location	Drift Rate (%)	Flow(gpm)	TDS (mg/L)	Emission Rate (tons/year)	
				PM	PM_{10}
Unit 1 Cooling Tower	0.001	6,000	2,150	0.28	0.17
Unit 2 Cooling Tower	0.001	6,000	2,150	0.28	0.17
Unit 3 Cooling Tower	0.001	6,500	2,150	0.31	0.19
Unit 4 Cooling Tower	0.008	6,500	2,150	2.4	1.4

Upgraded Unit 2 Cooling Tower

At the request of the EPC, TEC conducted calculations to estimate PM/PM_{10} emissions from the upgraded cooling tower. The calculations demonstrate the PM emissions are less than the 5.0 tons per year threshold. Consequently, the existing cooling tower is considered an insignificant source of emissions and exempt from air permitting requirements pursuant to Rule 62-

[1] Reisman, J. and Frisbie, G. , *Calculating Realistic PM_{10} Emissions from Cooling Towers*, Technical Proceedings, Air Waste Management Association, June 2001.

210.300(3)(b)1., F.A.C., *Generic Emission Unit or Activity Exemption.* A summary of the calculations is shown in Table 2. Emission calculations of the upgraded cooling tower are attached.

Table 2 –Upgraded Unit 2 Cooling Tower Emission Summary.

Location	Drift Rate (%)	Flow(gpm)	TDS (mg/L)	Emission Rate (tons/year)	
				PM	PM_{10}
Unit 2 Cooling Tower	0.005	6,000	2,150	1.4	0.86

The previous and revised calculations are in general agreement and demonstrate reasonable assurances of meeting the requirements to Rule 62-210.300(3)(b)1., F.A.C., *Generic Emission Unit or Activity Exemption.* TEC requests the permitting exemption for the upgraded cooling tower and inclusion of all permitted cooling towers as insignificant emissions.

Please contact me at (813) 228-4232 or Byron Burrows at (813) 228-1282, if you have any questions or comments.

Sincerely,

Robert A. Velasco, P.E., BCEE, QEP
Air Programs
Environmental, Health & Safety

EHS/rlk/RAV114

Enclosure

c/enc: Cindy Zhang-Torres, DEP SW District
Diana Lee, EPCHC

Tampa Electric Company
Big Bend Station

Cooling Tower Permit Correction Response

Professional Engineer Certification

1. Professional Engineer Name: Robert A. Velasco, P.E.
   Registration Number: 57190
2. Professional Engineer Address...
   Organization/Firm: Tampa Electric Company
   Street Address: P.O. Box 111
   City: Tampa State: FL Zip Code: 33601
3. Professional Engineer Telephone Numbers...
   Telephone: (813) 228 - 4232 Fax: (813) 228 - 1308
4. Professional Engineer E-mail Address: ravelasco@tecoenergy.com
5. Professional Engineer Statement:
   (1) Engineering opinion and information included herein provides reasonable assurance of meeting the requirements of the demonstrate reasonable assurances of meeting the requirements to Rule 62-210.300(3)(b)1., F.A.C;
   (2) Permit revision request is based on the best available information at the time of this application;
   (3) Information included herein is believed to be correct to the best of the Engineer's knowledge;
   (4) Emission information is based on acceptable techniques available for calculating emissions or estimating emissions from designated emission sources; and
   (5) Seal does not certify or attest to the accuracy of work or information prepared by others who are qualified to perform such services. This includes, but not limited to drawings, specifications, vendor information, engineering test data, correspondences, personnel communication etc.

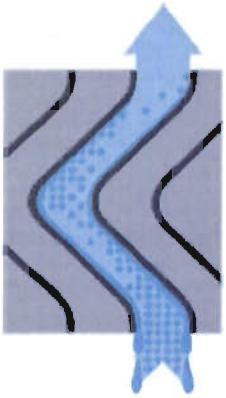
Signature/Date

(seal)

Existing Mist Eliminators

XF150MAx
Crossflow Cellular Drift Eliminators

XF150MAx Crossflow Cellular Drift Eliminators are specifically-designed to achieve maximum drift removal efficiency in crossflow tower applications by providing an upward flow path and discharge angle of 40-55° from horizontal (depending on installation angle) and molded-in drainage channels that direct the collected drift back to the wet section of the tower even when impacted by water spray.



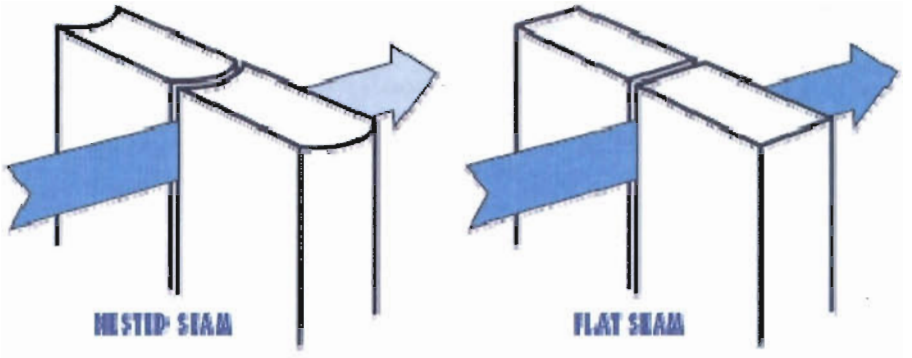
The modules are constructed of a series of sinusoidal-shaped corrugated CTI STD-136 PVC sheets that are mechanically assembled to mating sinusoidal structural waves to form closed cells. These cells force the drift droplets carried in the leaving airstream to make three distinct changes in direction. This disruption of the air flow creates centrifugal forces on the drift droplets, forcing them to be captured by inertial impaction and direct interception with the module walls and thereby removed from the airstream.

Applications

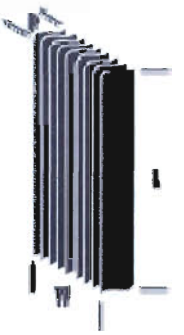
The XF150MAx is designed for applications requiring very low drift levels in crossflow Cooling Towers, Evaporative Cooling systems, Scrubbers, and High Humidity Cooling systems.

Features and Benefits

- The upward flow path and discharge angle of 40-55° from horizontal (depending on installation angle) is specifically-designed for crossflow applications. The XF150MAx is fully-effective even when installed vertically.
- Installed at the standard 10° from vertical (as shown at right on Brentwood XF-600 Supports), XF150MAx modules are strong enough to span 10 ft (3.0 m), requiring fewer support beams and less air blockage.
- XF150MAx modules "nest" with the modules next to them (below left) to provide "seamless" drift removal. This nesting design makes the nested space between packs a fully-functiioning drift removal cell instead of a "dead space" that can allow drift droplets to completely bypass the drift eliminators (below right).



• Patented "MA" (Mechanical Assembly) Technology for environmentally-friendly, glue-free packs that can be assembled on-site
• Can be field cut for a tight fit around columns and other structures without sacrificing structural integrity.
• High surface area (cell dimension of 1.50" [38mm]) provides maximum performance at minimum pressure drop.



Product Dimensions

CELL SIZE	MODULE DIMENSIONS		
	Depth	Width	Standard Lengths
1.500" (38.1 mm)	5.25" (133 mm)	12" (305 mm) or 18" (457 mm)	2 to 12 ft. in 2 ft. increments (610 to 3658 mm in 610 mm increments)

Product Weights/Span Capabilities

SHEET THICKNESS	DRY WEIGHT		MAXIMUM SPAN *
	lbs/ft2	kg/m2	
.015" (.38mm) Standard	1.0	4.9	8 ft (2.4m)
.020" (.51mm)	1.3	6.3	10 ft (3.0m)

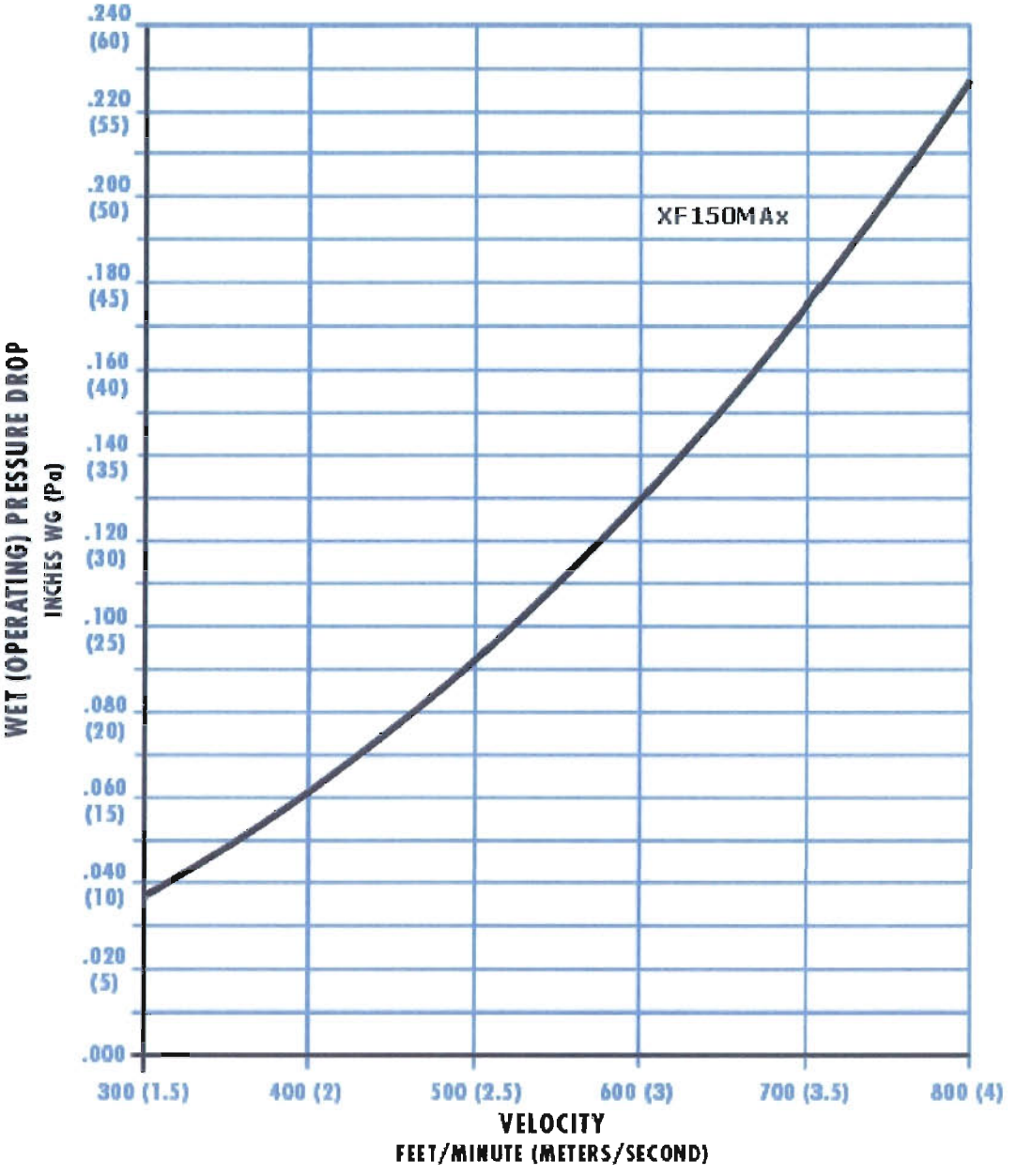
*Tested at a maximum of 115° F (46° C) with 2.0" (51mm) wide supports.

Drift Loss

.001% recirculation (Test Method CTI-HBIK Standard 140) is possible in new installations that are properly designed and installed and take advantage of the XF150MAx's fully-nesting design and Brentwood DriSeals. Retrofitting older cooling towers with XF150MAx Crossflow Drift Eliminators will also result in significant improvement in drift emissions.

Pressure Drop Curve

See CTI Technical Paper TP06-11 for comparative pressure drop tests of competing cellular drift eliminators.



Materials

XF150MAx Crossflow Cellular Drift Eliminators are made from PVC material that meets CTI (Cooling Tower Institute) Standard 136 and is UV protected. The PVC compounds used in Brentwood cellular drift eliminators have outstanding resistance to weather exposure, and are nearly impervious to chemical degradation by alkalis and acids, grease, fats, oils, and biological attack. PVC has an excellent fire rating due to its self-extinguishing characteristics.

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Laboratory Results

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Tampa Electric Laboratory Services

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Big Bend Power Station
Dana Spasojevic
13031 Wyandott Rd
Apollo Beach, FL 33572
ZSpasojevic@tecoenergy.com

Report Date: 06/10/11 13:19

Work Order - L11E075

Project - Hillsborough Co Water/Sun City Center

Case Narrative

2 sample(s) were received on 5/10/2011 2:05:00 PM .

There were no issues noted with the sample(s) associated with this workorder unless noted below.

Fluoride

The matrix spike and matrix spike duplicate were recoverved below the contorl limits. This analyte was flagged as a J qualifier.

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Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 * Ph (813)630-7490 * Fax (813)630-7360 * DOH #E54272

Sample Information

Lab Sample ID: **L11E075-01**
Sample Description: Sun City Center Effluent
Sample Collection Method: Grab

Sampled By: Robert Barthelette
Date and Time Collected: 5/10/11 11:20
Date of Sample Receipt: 5/10/11 14:05

Laboratory Results

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
Tampa Electric Company, Laboratory Services									
General Chemistry Parameters									
Alkalinity - Bicarbonate	**163**	mg/L	1.00	1.00		1	SM 2320B	RFL	5/23/11 13:22
Alkalinity - Carbonate	1.00	mg/L	1.00	1.00	U	1	SM 2320B	RFL	5/23/11 13:22
Alkalinity - Hydroxide	1.00	mg/L	1.00	1.00	U	1	SM 2320B	RFL	5/23/11 13:22
Alkalinity, Phenolphthalein	1.00	mg/L	1.00	1.00	U	1	SM 2320B	RFL	5/23/11 13:22
Alkalinity, Total (CaCO3)	**163**	mg/L	1.00	1.00		1	SM 2320B	RFL	5/23/11 13:22
Ammonia as N	0.0100	mg/L	0.0100	0.0500	U	1	EPA 350.1	RFL	5/12/11 10:48
Carbon Dioxide, Total	**152**	mg/L	1.00	1.00		1	SM 4500-CO2D	RFL	5/23/11 11:58
Chloride	**150**	mg/L	0.0400	1.00		2	EPA 300.0	SZS	5/25/11 3:20
Specific Conductance	**1020**	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	5/10/11 14:15
Ferrous Iron	0.200	mg/L	0.200	0.200	U	1	SM 3500 FE-B	RAB	5/10/11 11:30
Fluoride	**0.472**	mg/L	0.0200	0.100	J-	2	EPA 300.0	SZS	5/31/11 17:00
Total Hardness	**233**	mg/L	0.157	6.62		1	[CALC]	MCR	6/8/11 9:34
Nitrate as N	**2.42**	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	5/10/11 19:10
Nitrite as N	0.0200	mg/L	0.0200	0.0800	U	1	EPA 300.0	RFL	5/10/11 19:10
Total Kjeldahl Nitrogen	**0.723**	mg/L	0.0500	0.250		1	EPA 351.2	SZS	5/20/11 12:42
Orthophosphate	**0.250**	mg/L	0.0100	0.0400		1	SM 4500-P E	RFL	5/11/11 11:30
pH	**7.60**	pH Units	2.00	2.00		1	FDEP SOP FT 1100	RAB	5/10/11 11:30
Residual Chlorine	**0.200**	mg/L	0.00	0.0200		1	FDEP SOP FT 2000	RAB	5/10/11 11:30
Total Dissolved Solids	**613**	mg/L	19.0	25.0		1	SM 2540C	RFL	5/12/11 14:08
Sulfate	**101**	mg/L	1.00	4.00		2	EPA 300.0	SZS	5/25/11 3:20
Temperature	**28.1**	°C	4.00	4.00		1	FDEP SOP FT 1400	RAB	5/10/11 11:30
Total Nitrogen	**3.15**	mg/L	0.0800	0.380		1	Calc	SZS	5/20/11 12:42
Total Organic Carbon	**6.39**	mg/L	1.00	4.00		1	SM 5310B	EMD	5/20/11 15:36
Turbidity	**0.500**	NTU	0.00	0.100		1	FDEP SOP FT1600	RAB	5/10/11 11:30
Total Metals by 200 Series									
Aluminum	**0.0383**	mg/L	0.0230	0.100	I	1	EPA 200.7	MCR	5/26/11 13:16
Barium	**0.0131**	mg/L	0.000500	0.0200	I	1	EPA 200.7	MCR	5/26/11 13:16
Boron	**0.308**	mg/L	0.0100	0.0500		1	EPA 200.7	MCR	6/9/11 10:37
Calcium	**62.7**	mg/L	0.0300	1.00		1	EPA 200.7	MCR	6/8/11 9:34
Iron	**0.0467**	mg/L	0.00500	0.0200		1	EPA 200.7	MCR	5/26/11 13:16
Magnesium	**18.5**	mg/L	0.0200	1.00		1	EPA 200.7	MCR	6/8/11 9:34
Manganese	**0.0178**	mg/L	0.00100	0.0200	I	1	EPA 200.7	MCR	5/26/11 13:16
Potassium	**14.9**	mg/L	2.00	10.0		1	EPA 200.7	MCR	6/8/11 11:44
Silica (SiO2)	**22.7**	mg/L	0.0877	2.14		1	Calc	MCR	6/8/11 9:34
Silicon	**10.6**	mg/L	0.0410	1.00		1	EPA 200.7	MCR	6/8/11 9:34
Sodium	**113**	mg/L	0.370	2.00	V	1	EPA 200.7	MCR	5/31/11 15:08

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.

TECO TAMPA ELECTRIC

Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 * Ph (813)630-7490 * Fax (813)630-7360 * DOH #E54272

Sample Information

Lab Sample ID: **L11E075-01**
Sample Description: Sun City Center Effluent
Sample Collection Method: Grab

Sampled By: Robert Barthelette
Date and Time Collected: 5/10/11 11:20
Date of Sample Receipt: 5/10/11 14:05

Laboratory Results

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
Strontium	**1.35**	mg/L	0.000500	0.0200		1	EPA 200.7	MCR	5/26/11 13:16
			Advanced Environmental Laboratires, Inc.						
General Chemistry Parameters									
Chemical Oxygen Demand	**26**	mg/L	12	20		1	E410.4	TWCA	5/17/11 13:26
Sulfide	0.0062	mg/L	0.0062	0.05	Ua	1	SM 4500-S-D	TWCA	5/17/11 11:24
Biochemical Oxygen Demand	2	mg/L O2	2	2	Ua	1	SM 5210B	TWCA	5/11/11 12:18
Heterotrophic Plate Count	**30**	Col/1mL	1	1		1	SM 9215B	TMIA	5/10/11 16:30

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.

TECO TAMPA ELECTRIC

Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 * Ph (813)630-7490 * Fax (813)630-7360 * DOH #E54272

Sample Information

Lab Sample ID: **L11E075-02**
Sample Description: Hillsborough County Water
Sample Collection Method: Grab

Sampled By: Robert Barthelette
Date and Time Collected: 5/10/11 11:30
Date of Sample Receipt: 5/10/11 14:05

Laboratory Results

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
Tampa Electric Company, Laboratory Services									
General Chemistry Parameters									
Ammonia as N	**0.811**	mg/L	0.0100	0.0500		1	EPA 350.1	RFL	5/12/11 10:51
Nitrate + Nitrite Nitrogen (NOX)	**0.286**	mg/L	0.100	0.500	I	1	EPA 353.2	SZS	5/24/11 11:48
Total Kjeldahl Nitrogen	**1.00**	mg/L	0.0500	0.250		1	EPA 351.2	SZS	5/20/11 12:46
pH	**7.50**	pH Units	2.00	2.00		1	FDEP SOP FT 1100	RAB	5/10/11 11:30
Total Nitrogen	**1.29**	mg/L	0.0500	0.250		1	Calc	SZS	5/24/11 11:48

Comments

Ua	Not detected at or above the detection limit
U	Indicates that the compound was analyzed for but not detected.
J-	The reported value is an estimated value, see the case narrative for specifics.
I	Estimated value
V	Analyte detected in the method blank

Subcontract Laboratories:

Advanced Environmental Laboratires, Inc. E84589

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.

Total Metals by 200 Series - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Batch 11E0184 - EPA 200.7											
Blank (11E0184-BLK1)					Prepared: 05/24/11 Analyzed: 05/26/11						
Barium	0.000500	0.000500	0.0200	mg/L							U
Manganese	0.00100	0.00100	0.0200	mg/L							U
Iron	0.00500	0.00500	0.0200	mg/L							U
Aluminum	0.0230	0.0230	0.100	mg/L							U
Calcium	0.0300	0.0300	1.00	mg/L							U
Magnesium	0.0200	0.0200	1.00	mg/L							U
Strontium	0.000500	0.000500	0.0200	mg/L							U
Potassium	2.00	2.00	10.0	mg/L							U
Silicon	0.0410	0.0410	1.00	mg/L							U
Sodium	0.417	0.370	2.00	mg/L							I
Boron	0.0100	0.0100	0.0500	mg/L							U
LCS (11E0184-BS1)					Prepared: 05/24/11 Analyzed: 05/26/11						
Iron	0.202	0.00500	0.0200	mg/L	0.200		101	85-115			
Sodium	61.0	0.370	2.00	mg/L	58.2		105	85-115			V
Calcium	49.5	0.0300	1.00	mg/L	50.0		99.1	85-115			
Boron	2.07	0.0100	0.0500	mg/L	2.00		103	85-115			
Manganese	0.203	0.00100	0.0200	mg/L	0.200		102	85-115			
Strontium	1.95	0.000500	0.0200	mg/L	2.00		97.6	85-115			
Silicon	5.69	0.0410	1.00	mg/L	5.05		113	85-115			
Potassium	48.8	2.00	10.0	mg/L	50.0		97.6	85-115			
Magnesium	53.8	0.0200	1.00	mg/L	50.0		108	85-115			
Aluminum	2.07	0.0230	0.100	mg/L	2.00		104	85-115			
Barium	2.13	0.000500	0.0200	mg/L	2.00		106	85-115			
Matrix Spike (11E0184-MS1)		**Source: L11E128-01**			Prepared: 05/24/11 Analyzed: 05/31/11						
Sodium	178	0.370	2.00	mg/L	58.2	116	106	70-130			V
Potassium	67.4	2.00	10.0	mg/L	50.0	15.2	104	70-130			
Magnesium	68.0	0.0200	1.00	mg/L	50.0	18.4	99.1	70-130			
Manganese	0.216	0.00100	0.0200	mg/L	0.200	0.0272	94.6	70-130			
Barium	2.07	0.000500	0.0200	mg/L	2.00	0.0119	103	70-130			
Iron	0.245	0.00500	0.0200	mg/L	0.200	0.0616	91.7	70-130			
Silicon	15.9	0.0410	1.00	mg/L	5.05	10.3	111	70-130			
Aluminum	2.05	0.0230	0.100	mg/L	2.00	0.0382	101	70-130			
Calcium	111	0.0300	1.00	mg/L	50.0	62.0	98.6	70-130			
Strontium	3.31	0.000500	0.0200	mg/L	2.00	1.27	102	70-130			
Boron	2.35	0.0100	0.0500	mg/L	2.00	0.290	103	70-130			

Total Metals by 200 Series - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Batch 11E0184 - EPA 200.7											
Matrix Spike Dup (11E0184-MSD1)		**Source: L11E128-01**			Prepared: 05/24/11 Analyzed: 06/08/11						
Potassium	68.0	2.00	10.0	mg/L	50.0	15.2	106	70-130	0.986	20	
Iron	0.258	0.00500	0.0200	mg/L	0.200	0.0616	98.3	70-130	5.25	20	
Manganese	0.225	0.00100	0.0200	mg/L	0.200	0.0272	98.8	70-130	3.79	20	
Silicon	15.9	0.0410	1.00	mg/L	5.05	10.3	112	70-130	0.254	20	
Boron	2.37	0.0100	0.0500	mg/L	2.00	0.290	104	70-130	1.09	20	
Aluminum	2.10	0.0230	0.100	mg/L	2.00	0.0382	103	70-130	2.55	20	
Sodium	184	0.370	2.00	mg/L	58.2	116	117	70-130	3.43	20	V
Magnesium	68.5	0.0200	1.00	mg/L	50.0	18.4	100	70-130	0.761	20	
Strontium	3.30	0.000500	0.0200	mg/L	2.00	1.27	101	70-130	0.194	20	
Calcium	111	0.0300	1.00	mg/L	50.0	62.0	97.1	70-130	0.677	20	
Barium	2.11	0.000500	0.0200	mg/L	2.00	0.0119	105	70-130	1.73	20	

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General Chemistry Parameters - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Batch 11E0066 - No Prep - Wet Chem											
Blank (11E0066-BLK1)					Prepared & Analyzed: 05/10/11						
Nitrate as N	0.0100	0.0100	0.0500	mg/L							U
Nitrite as N	0.0200	0.0200	0.0800	mg/L							U
LCS (11E0066-BS1)					Prepared & Analyzed: 05/10/11						
Nitrite as N	1.06	0.0200	0.0800	mg/L	1.00		106	90-110			
Nitrate as N	1.00	0.0100	0.0500	mg/L	1.00		100	90-110			
Matrix Spike (11E0066-MS1)		**Source: L11E034-01**			Prepared & Analyzed: 05/10/11						
Nitrate as N	0.924	0.0200	0.100	mg/L	1.00	U	92.4	90-110			
Nitrite as N	0.988	0.0400	0.160	mg/L	1.00	U	98.8	90-110			
Matrix Spike Dup (11E0066-MSD1)		**Source: L11E034-01**			Prepared & Analyzed: 05/10/11						
Nitrite as N	1.00	0.0400	0.160	mg/L	1.00	U	100	90-110	1.61	20	
Nitrate as N	0.968	0.0200	0.100	mg/L	1.00	U	96.8	90-110	4.65	20	
Batch 11E0074 - No Prep - Wet Chem											
Blank (11E0074-BLK1)					Prepared & Analyzed: 05/11/11						
Orthophosphate	0.0100	0.0100	0.0400	mg/L							U
LCS (11E0074-BS1)					Prepared & Analyzed: 05/11/11						
Orthophosphate	0.430	0.0100	0.0400	mg/L	0.400		108	90-110			
Matrix Spike (11E0074-MS1)		**Source: L11E075-01**			Prepared & Analyzed: 05/11/11						
Orthophosphate	0.630	0.0100	0.0400	mg/L	0.400	0.250	95.0	90-110			
Matrix Spike Dup (11E0074-MSD1)		**Source: L11E075-01**			Prepared & Analyzed: 05/11/11						
Orthophosphate	0.630	0.0100	0.0400	mg/L	0.400	0.250	95.0	90-110	0.00	20	

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General Chemistry Parameters - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Batch 11E0089 - No Prep - Wet Chem											
Blank (11E0089-BLK1)					Prepared & Analyzed: 05/12/11						
Ammonia as N	0.0100	0.0100	0.0500	mg/L							U
LCS (11E0089-BS1)					Prepared & Analyzed: 05/12/11						
Ammonia as N	1.02	0.0100	0.0500	mg/L	1.00		102	90-110			
Matrix Spike (11E0089-MS1)		**Source: L11E075-01**			Prepared & Analyzed: 05/12/11						
Ammonia as N	0.973	0.0100	0.0500	mg/L	1.00	U	97.3	90-110			
Matrix Spike (11E0089-MS2)		**Source: L11E083-01**			Prepared & Analyzed: 05/12/11						
Ammonia as N	368	0.500	2.50	mg/L	50.0	337	62.4	90-110			J-
Matrix Spike Dup (11E0089-MSD1)		**Source: L11E075-01**			Prepared & Analyzed: 05/12/11						
Ammonia as N	0.976	0.0100	0.0500	mg/L	1.00	U	97.6	90-110	0.308	20	
Matrix Spike Dup (11E0089-MSD2)		**Source: L11E083-01**			Prepared & Analyzed: 05/12/11						
Ammonia as N	382	0.500	2.50	mg/L	50.0	337	91.5	90-110	3.88	20	
Batch 11E0091 - No Prep - Wet Chem											
Blank (11E0091-BLK1)					Prepared & Analyzed: 05/12/11						
Total Dissolved Solids	19.0	19.0	25.0	mg/L							U
LCS (11E0091-BS1)					Prepared & Analyzed: 05/12/11						
Total Dissolved Solids	12300	76.0	100	mg/L	13200		93.0	80-120			
Duplicate (11E0091-DUP1)		**Source: L11E007-05**			Prepared & Analyzed: 05/12/11						
Total Dissolved Solids	780	190	250	mg/L		780			0.00	10	

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General Chemistry Parameters - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Batch 11E0091 - No Prep - Wet Chem											
Duplicate (11E0091-DUP2)		**Source: L11E075-01**			Prepared & Analyzed: 05/12/11						
Total Dissolved Solids	613	19.0	25.0	mg/L		613			0.00	10	
Batch 11E0107 - No Prep - Wet Chem											
Blank (11E0107-BLK1)					Prepared: 05/16/11 Analyzed: 05/20/11						
Total Kjeldahl Nitrogen	0.0500	0.0500	0.250	mg/L							U
LCS (11E0107-BS1)					Prepared: 05/16/11 Analyzed: 05/20/11						
Total Kjeldahl Nitrogen	1.20	0.0500	0.250	mg/L	1.25		96.2	90-110			
Matrix Spike (11E0107-MS1)		**Source: L11E075-01**			Prepared: 05/16/11 Analyzed: 05/20/11						
Total Kjeldahl Nitrogen	11.1	0.0500	0.250	mg/L	10.0	0.723	103	90-110			
Matrix Spike (11E0107-MS2)		**Source: L11E027-02**			Prepared: 05/16/11 Analyzed: 05/20/11						
Total Kjeldahl Nitrogen	10.6	0.0500	0.250	mg/L	10.0	0.458	101	90-110			
Matrix Spike Dup (11E0107-MSD1)		**Source: L11E075-01**			Prepared: 05/16/11 Analyzed: 05/20/11						
Total Kjeldahl Nitrogen	11.0	0.0500	0.250	mg/L	10.0	0.723	103	90-110	0.444	20	
Matrix Spike Dup (11E0107-MSD2)		**Source: L11E027-02**			Prepared: 05/16/11 Analyzed: 05/20/11						
Total Kjeldahl Nitrogen	10.6	0.0500	0.250	mg/L	10.0	0.458	101	90-110	0.104	20	
Batch 11E0108 - No Prep - Wet Chem											
Blank (11E0108-BLK1)					Prepared & Analyzed: 05/24/11						
Nitrate + Nitrite Nitrogen (NOX)	0.100	0.100	0.500	mg/L							U

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General Chemistry Parameters - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Batch 11E0108 - No Prep - Wet Chem											
LCS (11E0108-BS1)					Prepared & Analyzed: 05/24/11						
Nitrate + Nitrite Nitrogen (NOX)	0.998	0.100	0.500	mg/L	1.00		99.8	90-110			
Matrix Spike (11E0108-MS1)			Source: L11E027-02		Prepared & Analyzed: 05/24/11						
Nitrate + Nitrite Nitrogen (NOX)	2.12	0.200	1.00	mg/L	2.00	U	106	90-110			
Matrix Spike (11E0108-MS2)			Source: L11E079-02		Prepared & Analyzed: 05/24/11						
Nitrate + Nitrite Nitrogen (NOX)	2.12	0.200	1.00	mg/L	2.00	U	106	90-110			
Matrix Spike Dup (11E0108-MSD1)			Source: L11E027-02		Prepared & Analyzed: 05/24/11						
Nitrate + Nitrite Nitrogen (NOX)	2.11	0.200	1.00	mg/L	2.00	U	106	90-110	0.189	20	
Matrix Spike Dup (11E0108-MSD2)			Source: L11E079-02		Prepared & Analyzed: 05/24/11						
Nitrate + Nitrite Nitrogen (NOX)	2.12	0.200	1.00	mg/L	2.00	U	106	90-110	0.377	20	
Batch 11E0151 - No Prep - Wet Chem											
Blank (11E0151-BLK1)					Prepared & Analyzed: 05/20/11						
Total Organic Carbon	1.00	1.00	4.00	mg/L							U
LCS (11E0151-BS1)					Prepared & Analyzed: 05/20/11						
Total Organic Carbon	21.9			mg/L	20.0		110	90-110			
Matrix Spike (11E0151-MS1)			Source: L11E007-13		Prepared & Analyzed: 05/20/11						
Total Organic Carbon	28.1			mg/L	25.0	1.68	106	80-120			
Matrix Spike Dup (11E0151-MSD1)			Source: L11E007-13		Prepared & Analyzed: 05/20/11						
Total Organic Carbon	28.0			mg/L	25.0	1.68	105	80-120	0.356	20	

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General Chemistry Parameters - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Batch 11E0165 - No Prep - Wet Chem											
Blank (11E0165-BLK1)					Prepared & Analyzed: 05/23/11						
Alkalinity, Total (CaCO3)			1.00	mg/L							U
Alkalinity, Phenolphthalein			1.00	mg/L							U
Alkalinity - Hydroxide			1.00	mg/L							U
Alkalinity - Carbonate			1.00	mg/L							U
Alkalinity - Bicarbonate			1.00	mg/L							U
LCS (11E0165-BS1)					Prepared & Analyzed: 05/23/11						
Alkalinity, Total (CaCO3)	99.0		1.00	mg/L	100		99.0	90-110			
Matrix Spike (11E0165-MS1)		Source: L11E075-01			Prepared & Analyzed: 05/23/11						
Alkalinity, Total (CaCO3)	210		1.00	mg/L	50.0	163	94.0	90-110			
Matrix Spike Dup (11E0165-MSD1)		Source: L11E075-01			Prepared & Analyzed: 05/23/11						
Alkalinity, Total (CaCO3)	212		1.00	mg/L	50.0	163	98.0	90-110	0.948	20	
Batch 11E0179 - No Prep - Wet Chem											
Blank (11E0179-BLK1)					Prepared & Analyzed: 05/24/11						
Chloride	0.0200	0.0200	0.500	mg/L							U
Sulfate	*0.500*	*0.500*	*2.00*	*mg/L*							*U*
LCS (11E0179-BS1)					Prepared & Analyzed: 05/24/11						
Chloride	9.49	0.0200	0.500	mg/L	10.0		94.9	90-110			
Sulfate	10.2	0.500	2.00	mg/L	10.0		102	90-110			
Matrix Spike (11E0179-MS1)		Source: L11E007-20			Prepared & Analyzed: 05/24/11						
Chloride	202	0.400	10.0	mg/L	100	109	93.0	90-110			
Sulfate	1250	10.0	40.0	mg/L	100	1140	101	90-110			

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General Chemistry Parameters - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Batch 11E0179 - No Prep - Wet Chem											
Matrix Spike (11E0179-MS2)		**Source: L11E075-01**			Prepared & Analyzed: 05/25/11						
Chloride	161	0.0400	1.00	mg/L	10.0	150	103	90-110			
Sulfate	112	1.00	4.00	mg/L	10.0	101	108	90-110			
Matrix Spike Dup (11E0179-MSD1)		**Source: L11E007-20**			Prepared & Analyzed: 05/24/11						
Chloride	203	0.400	10.0	mg/L	100	109	93.6	90-110	0.316	20	
Sulfate	1250	10.0	40.0	mg/L	100	1140	106	90-110	0.421	20	
Matrix Spike Dup (11E0179-MSD2)		**Source: L11E075-01**			Prepared & Analyzed: 05/25/11						
Chloride	161	0.0400	1.00	mg/L	10.0	150	105	90-110	0.146	20	
Sulfate	112	1.00	4.00	mg/L	10.0	101	108	90-110	0.00893	20	
Batch 11E0208 - No Prep - Wet Chem											
Blank (11E0208-BLK1)					Prepared & Analyzed: 05/31/11						
Chloride	0.0200	0.0200	0.500	mg/L							U
Sulfate	0.500	0.500	2.00	mg/L							U
Fluoride	0.0100	0.0100	0.0500	mg/L							U
LCS (11E0208-BS1)					Prepared & Analyzed: 05/31/11						
Chloride	9.63	0.0200	0.500	mg/L	10.0		96.3	90-110			
Sulfate	10.2	0.500	2.00	mg/L	10.0		102	90-110			
Fluoride	0.975	0.0100	0.0500	mg/L	1.00		97.5	90-110			
Matrix Spike (11E0208-MS1)		**Source: L11E075-01**			Prepared & Analyzed: 05/31/11						
Chloride	161	0.0400	1.00	mg/L	10.0	150	108	90-110			
Fluoride	1.31	0.0200	0.100	mg/L	1.00	0.472	83.8	90-110			J-
Sulfate	112	1.00	4.00	mg/L	10.0	101	105	90-110			

General Chemistry Parameters - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Batch 11E0208 - No Prep - Wet Chem											
Matrix Spike Dup (11E0208-MSD1)		**Source: L11E075-01**			Prepared & Analyzed: 05/31/11						
Chloride	161	0.0400	1.00	mg/L	10.0	150	107	90-110	0.0733	20	
Fluoride	1.31	0.0200	0.100	mg/L	1.00	0.472	83.4	90-110	0.306	20	J-
Sulfate	112	1.00	4.00	mg/L	10.0	101	106	90-110	0.0824	20	

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General Chemistry Parameters - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Batch 49667 - No Prep											
MB (733952)					Prepared:	Analyzed: 05/11/11					**Ua**
Biochemical Oxygen Demand	2		2	mg/L O2				-			
LCS (733953)		**Source: 733952**			Prepared:	Analyzed: 05/11/11					
Biochemical Oxygen Demand	190		2	mg/L O2	200	2.0U	97	84.6-115.4			
DUP (733954)		**Source: T1106217002**			Prepared:	Analyzed: 05/11/11					
Biochemical Oxygen Demand	270		2	mg/L O2		260		-			
Batch 50067 - No Prep											
MB (736264)					Prepared:	Analyzed: 05/10/11					**Ua**
Heterotrophic Plate Count	1		1	Col/1mL				-			
Batch 50227 - No Prep											
MB (737050)					Prepared:	Analyzed: 05/17/11					**Ua**
Chemical Oxygen Demand	12		20	mg/L				-			
LCS (737051)		**Source: 737050**			Prepared:	Analyzed: 05/17/11					
Chemical Oxygen Demand	530		20	mg/L	500	12U	106	-			
MS (737054)		**Source: T1106494003**			Prepared:	Analyzed: 05/17/11					
Chemical Oxygen Demand	1100		20	mg/L	500	610	104	-			
MSD (737055)		**Source: T1106494003**			Prepared:	Analyzed: 05/17/11					
Chemical Oxygen Demand	1100		20	mg/L	500	610	103	-			

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General Chemistry Parameters - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Batch 50231 - No Prep											
MB (737126)					Prepared:	Analyzed: 05/17/11					**Ua**
Sulfide	0.0062		0.05	mg/L				-			
LCS (737129)		**Source: 737126**			Prepared:	Analyzed: 05/17/11					
Sulfide	0.51		0.05	mg/L	0.5	0.0062U	102	90-110			
MS (737130)		**Source: L11E075-01**			Prepared:	Analyzed: 05/17/11					
Sulfide	0.52		0.05	mg/L	0.5	0.0062U	104	90-110			
MSD (737131)		**Source: L11E075-01**			Prepared:	Analyzed: 05/17/11					
Sulfide	0.5		0.05	mg/L	0.5	0.0062U	101	90-110			

Tampa Electric Company, Laboratory Services

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Peggy Penner, Manager, Laboratory Services

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Big Bend Power Station
Dana Spasojevic
13031 Wyandott Rd
Apollo Beach, FL 33572
ZSpasojevic@tecoenergy.com

Report Date: 06/15/11 12:24

Work Order - **L11E128**

Project - Hillsborough Co Water/Sun City Center

Case Narrative

2 sample(s) were received on 5/24/2011 1:00:00 PM .

There were no issues noted with the sample(s) associated with this workorder unless noted below.

EPA 300.0 (Cl, F, SO4)

The matrix spike and matrix spike duplicate were outside of the control limits for Chloride, Fluoride and Sulfate due to matrix interference. The LCS for this batch was acceptable therefore the batch was accepted.

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TAMPA ELECTRIC

Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 * Ph (813)630-7490 * Fax (813)630-7360 * DOH #E54272

Sample Information

Lab Sample ID: **L11E128-01**
Sample Description: Sun City Center Effluent
Sample Collection Method: Grab

Sampled By: Robert Barthelette
Date and Time Collected: 5/24/11 10:35
Date of Sample Receipt: 5/24/11 13:00

Laboratory Results

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
Tampa Electric Company, Laboratory Services									
General Chemistry Parameters									
Alkalinity - Bicarbonate	**171**	mg/L	1.00	1.00		1	SM 2320B	RFL	6/3/11 10:30
Alkalinity - Carbonate	1.00	mg/L	1.00	1.00	U	1	SM 2320B	RFL	6/3/11 10:30
Alkalinity - Hydroxide	1.00	mg/L	1.00	1.00	U	1	SM 2320B	RFL	6/3/11 10:30
Alkalinity, Phenolphthalein	1.00	mg/L	1.00	1.00	U	1	SM 2320B	RFL	6/3/11 10:30
Alkalinity, Total (CaCO3)	**171**	mg/L	1.00	1.00		1	SM 2320B	RFL	6/3/11 10:30
Ammonia as N	0.0100	mg/L	0.0100	0.0500	U	1	EPA 350.1	RFL	5/25/11 16:03
Carbon Dioxide, Total	**152**	mg/L	1.00	1.00		1	SM 4500-CO2D	RFL	6/3/11 10:30
Chloride	**156**	mg/L	0.0400	1.00	J-	2	EPA 300.0	SZS	6/3/11 15:23
Specific Conductance	**1010**	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	5/24/11 10:35
Ferrous Iron	0.200	mg/L	0.200	0.200	U	1	SM 3500 FE-B	RAB	5/24/11 10:35
Fluoride	**0.470**	mg/L	0.0200	0.100	J-	2	EPA 300.0	SZS	6/3/11 15:23
Total Hardness	**231**	mg/L	0.157	6.62		1	[CALC]	MCR	6/8/11 9:38
Nitrate as N	**1.30**	mg/L	0.0100	0.0500		1	EPA 300.0	SZS	5/25/11 5:58
Nitrate + Nitrite Nitrogen (NOX)	**1.30**	mg/L	0.0300	0.130		1	Calc	SZS	5/25/11 5:58
Nitrite as N	0.0200	mg/L	0.0200	0.0800	U	1	EPA 300.0	SZS	5/25/11 5:58
Total Kjeldahl Nitrogen	**0.553**	mg/L	0.0500	0.250		1	EPA 351.2	SZS	6/9/11 15:11
Orthophosphate	**0.300**	mg/L	0.0100	0.0400		1	SM 4500-P E	RFL	5/25/11 14:18
pH	**7.50**	pH Units	2.00	2.00		1	FDEP SOP FT 1100	RAB	5/24/11 10:35
Residual Chlorine	**0.270**	mg/L	0.200	0.200		1	FDEP SOP FT 2000	RAB	5/24/11 10:35
Total Dissolved Solids	**611**	mg/L	19.0	25.0		1	SM 2540C	RFL	5/27/11 13:45
Sulfate	**102**	mg/L	1.00	4.00	J-	2	EPA 300.0	SZS	6/3/11 15:23
Temperature	**28.0**	°C	4.00	4.00		1	FDEP SOP FT 1400	RAB	5/24/11 10:35
Total Nitrogen	**1.85**	mg/L	0.0800	0.380		1	Calc	SZS	6/9/11 15:11
Total Organic Carbon	**6.63**	mg/L	1.00	4.00		1	SM 5310B	EMD	5/24/11 16:49
Turbidity	**0.600**	NTU	0.100	0.100		1	FDEP SOP FT1600	RAB	5/24/11 10:35
Total Metals by 200 Series									
Aluminum	**38.2**	ug/L	23.0	100	I	1	EPA 200.7	MCR	5/26/11 14:10
Barium	**11.9**	ug/L	0.500	20.0	I	1	EPA 200.7	MCR	5/26/11 14:10
Boron	**290**	ug/L	10.0	50.0		1	EPA 200.7	MCR	6/9/11 10:43
Calcium	**62000**	ug/L	30.0	1000		1	EPA 200.7	MCR	6/8/11 9:38
Iron	**61.6**	ug/L	5.00	20.0		1	EPA 200.7	MCR	5/26/11 14:10
Magnesium	**18400**	ug/L	20.0	1000		1	EPA 200.7	MCR	6/8/11 9:38
Manganese	**27.2**	ug/L	1.00	20.0		1	EPA 200.7	MCR	5/26/11 14:10
Potassium	**15200**	ug/L	2000	10000		1	EPA 200.7	MCR	6/8/11 11:48
Silica (SiO2)	**22.0**	mg/L	0.0877	2.14		1	Calc	MCR	6/8/11 9:38
Silicon	**10300**	ug/L	41.0	1000		1	EPA 200.7	MCR	6/8/11 9:38

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.

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Sample Information

Lab Sample ID: **L11E128-01**
Sample Description: Sun City Center Effluent
Sample Collection Method: Grab

Sampled By: Robert Barthelette
Date and Time Collected: 5/24/11 10:35
Date of Sample Receipt: 5/24/11 13:00

Laboratory Results

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
Sodium	**116000**	ug/L	370	2000	V	1	EPA 200.7	MCR	5/31/11 15:12
Strontium	**1270**	ug/L	0.500	20.0		1	EPA 200.7	MCR	5/26/11 14:10
				Advanced Environmental Laboratires, Inc.					
SM 4500-S-D									
Sulfide	**0.01**	mg/L	0.0062	0.05	I	1	SM 4500-S-D	TWCA	5/26/11 14:26
SM 5210B									
Biochemical Oxygen Demand	2	mg/L O2	2	2	Ua	1	SM 5210B	TWCA	5/25/11 12:36
SM 9215B									
Heterotrophic Plate Count	**500**	Col/1mL	1	1		1	SM 9215B	TMIA	5/24/11 12:40
				TestAmerica Tampa					
COD									
Chemical Oxygen Demand	**11**	mg/L	10	20	Ia	1	SM 5220D	EM	6/2/11 14:11

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Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 * Ph (813)630-7490 * Fax (813)630-7360 * DOH #E54272

Sample Information

Lab Sample ID: **L11E128-02**
Sample Description: Hillsborough County Water
Sample Collection Method: Grab

Sampled By: Robert Barthelette
Date and Time Collected: 5/24/11 10:15
Date of Sample Receipt: 5/24/11 13:00

Laboratory Results

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
Tampa Electric Company, Laboratory Services									
General Chemistry Parameters									
Ammonia as N	**0.780**	mg/L	0.0100	0.0500		1	EPA 350.1	RFL	5/25/11 16:09
Nitrate + Nitrite Nitrogen (NOX)	**0.282**	mg/L	0.200	1.00	I	2	EPA 353.2	SZS	6/3/11 15:48
Total Kjeldahl Nitrogen	**1.04**	mg/L	0.0500	0.250		1	EPA 351.2	SZS	6/9/11 15:15
pH	**7.40**	pH Units	2.00	2.00		1	FDEP SOP FT 1100	RAB	5/24/11 10:15
Total Nitrogen	**1.33**	mg/L	0.0500	0.250		2	Calc	SZS	6/9/11 15:15

Comments

Ua	Not detected at or above the detection limit
U	Indicates that the compound was analyzed for but not detected.
J-	The reported value is an estimated value, see the case narrative for specifics.
I	Estimated value
Ia	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
I	Result is between DL and RL
V	Analyte detected in the method blank

Subcontract Laboratories:

Advanced Environmental Laboratires, Inc.	E84589
TestAmerica Tampa	E84282

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Total Metals by 200 Series - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Batch 11E0184 - EPA 200.7											
Blank (11E0184-BLK1)					Prepared: 05/24/11 Analyzed: 05/26/11						
Aluminum	23.0	23.0	100	ug/L							U
Strontium	0.500	0.500	20.0	ug/L							U
Iron	5.00	5.00	20.0	ug/L							U
Calcium	30.0	30.0	1000	ug/L							U
Silicon	41.0	41.0	1000	ug/L							U
Sodium	417	370	2000	ug/L							I
Potassium	2000	2000	10000	ug/L							U
Magnesium	20.0	20.0	1000	ug/L							U
Boron	10.0	10.0	50.0	ug/L							U
Manganese	1.00	1.00	20.0	ug/L							U
Barium	0.500	0.500	20.0	ug/L							U
LCS (11E0184-BS1)					Prepared: 05/24/11 Analyzed: 05/26/11						
Manganese	203	1.00	20.0	ug/L	200		102	85-115			
Silicon	5690	41.0	1000	ug/L	5050		113	85-115			
Sodium	61000	370	2000	ug/L	58200		105	85-115			V
Magnesium	53800	20.0	1000	ug/L	50000		108	85-115			
Iron	202	5.00	20.0	ug/L	200		101	85-115			
Strontium	1950	0.500	20.0	ug/L	2000		97.6	85-115			
Barium	2130	0.500	20.0	ug/L	2000		106	85-115			
Potassium	48800	2000	10000	ug/L	50000		97.6	85-115			
Aluminum	2070	23.0	100	ug/L	2000		104	85-115			
Boron	2070	10.0	50.0	ug/L	2000		103	85-115			
Calcium	49500	30.0	1000	ug/L	50000		99.1	85-115			
Matrix Spike (11E0184-MS1)		**Source: L11E128-01**			Prepared: 05/24/11 Analyzed: 05/26/11						
Manganese	216	1.00	20.0	ug/L	200	27.2	94.6	70-130			
Barium	2070	0.500	20.0	ug/L	2000	11.9	103	70-130			
Magnesium	68000	20.0	1000	ug/L	50000	18400	99.1	70-130			
Iron	245	5.00	20.0	ug/L	200	61.6	91.7	70-130			
Boron	2350	10.0	50.0	ug/L	2000	290	103	70-130			
Potassium	67400	2000	10000	ug/L	50000	15200	104	70-130			
Silicon	15900	41.0	1000	ug/L	5050	10300	111	70-130			
Aluminum	2050	23.0	100	ug/L	2000	38.2	101	70-130			
Calcium	111000	30.0	1000	ug/L	50000	62000	98.6	70-130			
Sodium	178000	370	2000	ug/L	58200	116000	106	70-130			V
Strontium	3310	0.500	20.0	ug/L	2000	1270	102	70-130			

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Total Metals by 200 Series - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Batch 11E0184 - EPA 200.7											
Matrix Spike Dup (11E0184-MSD1)		**Source: L11E128-01**			Prepared: 05/24/11 Analyzed: 05/26/11						
Barium	2110	0.500	20.0	ug/L	2000	11.9	105	70-130	1.73	20	
Manganese	225	1.00	20.0	ug/L	200	27.2	98.8	70-130	3.79	20	
Strontium	3300	0.500	20.0	ug/L	2000	1270	101	70-130	0.194	20	
Boron	2370	10.0	50.0	ug/L	2000	290	104	70-130	1.09	20	
Magnesium	68500	20.0	1000	ug/L	50000	18400	100	70-130	0.761	20	
Potassium	68000	2000	10000	ug/L	50000	15200	106	70-130	0.986	20	
Calcium	111000	30.0	1000	ug/L	50000	62000	97.1	70-130	0.677	20	
Sodium	184000	370	2000	ug/L	58200	116000	117	70-130	3.43	20	V
Iron	258	5.00	20.0	ug/L	200	61.6	98.3	70-130	5.25	20	
Silicon	15900	41.0	1000	ug/L	5050	10300	112	70-130	0.254	20	
Aluminum	2100	23.0	100	ug/L	2000	38.2	103	70-130	2.55	20	

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General Chemistry Parameters - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Batch 11E0186 - No Prep - Wet Chem											
Blank (11E0186-BLK1)					Prepared & Analyzed: 05/24/11						
Total Organic Carbon	1.00	1.00	4.00	mg/L							U
LCS (11E0186-BS1)					Prepared & Analyzed: 05/24/11						
Total Organic Carbon	21.9			mg/L	20.0		110	90-110			
Matrix Spike (11E0186-MS1)		**Source: L11E007-40**			Prepared & Analyzed: 05/24/11						
Total Organic Carbon	34.6			mg/L	25.0	7.44	108	80-120			
Matrix Spike Dup (11E0186-MSD1)		**Source: L11E007-40**			Prepared & Analyzed: 05/24/11						
Total Organic Carbon	34.3			mg/L	25.0	7.44	108	80-120	0.639	20	
Batch 11E0191 - No Prep - Wet Chem											
Blank (11E0191-BLK1)					Prepared & Analyzed: 05/25/11						
Nitrite as N	0.0200	0.0200	0.0800	mg/L							U
Nitrate as N	0.0100	0.0100	0.0500	mg/L							U
LCS (11E0191-BS1)					Prepared & Analyzed: 05/25/11						
Nitrate as N	0.961	0.0100	0.0500	mg/L	1.00		96.1	90-110			
Nitrite as N	1.02	0.0200	0.0800	mg/L	1.00		102	90-110			
Matrix Spike (11E0191-MS1)		**Source: L11E128-01**			Prepared & Analyzed: 05/25/11						
Nitrate as N	2.24	0.0200	0.100	mg/L	1.00	1.30	94.6	90-110			
Nitrite as N	1.05	0.0400	0.160	mg/L	1.00	U	105	90-110			
Matrix Spike Dup (11E0191-MSD1)		**Source: L11E128-01**			Prepared & Analyzed: 05/25/11						
Nitrite as N	1.08	0.0400	0.160	mg/L	1.00	U	108	90-110	2.83	20	
Nitrate as N	2.24	0.0200	0.100	mg/L	1.00	1.30	94.6	90-110	0.00	20	

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General Chemistry Parameters - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Batch 11E0192 - No Prep - Wet Chem											
Blank (11E0192-BLK1)					Prepared & Analyzed: 05/25/11						
Orthophosphate	0.0100	0.0100	0.0400	mg/L							U
LCS (11E0192-BS1)					Prepared & Analyzed: 05/25/11						
Orthophosphate	0.440	0.0100	0.0400	mg/L	0.400		110	90-110			
Matrix Spike (11E0192-MS1)		**Source: L11E128-01**			Prepared & Analyzed: 05/25/11						
Orthophosphate	0.670	0.0100	0.0400	mg/L	0.400	0.300	92.5	90-110			
Matrix Spike Dup (11E0192-MSD1)		**Source: L11E128-01**			Prepared & Analyzed: 05/25/11						
Orthophosphate	*0.670*	*0.0100*	*0.0400*	mg/L	*0.400*	*0.300*	92.5	90-110	*0.00*	20	
Batch 11E0195 - No Prep - Wet Chem											
Blank (11E0195-BLK1)					Prepared & Analyzed: 05/25/11						
Ammonia as N	0.0100	0.0100	0.0500	mg/L							U
LCS (11E0195-BS1)					Prepared & Analyzed: 05/25/11						
Ammonia as N	0.993	0.0100	0.0500	mg/L	1.00		99.3	90-110			
Matrix Spike (11E0195-MS1)		**Source: L11E128-02**			Prepared & Analyzed: 05/25/11						
Ammonia as N	1.76	0.0100	0.0500	mg/L	1.00	0.780	97.6	90-110			
Matrix Spike (11E0195-MS2)		**Source: L11E128-01**			Prepared & Analyzed: 05/25/11						
Ammonia as N	0.963	0.0100	0.0500	mg/L	1.00	U	96.3	90-110			
Matrix Spike Dup (11E0195-MSD1)		**Source: L11E128-02**			Prepared & Analyzed: 05/25/11						
Ammonia as N	1.77	0.0100	0.0500	mg/L	1.00	0.780	98.9	90-110	0.738	20	

General Chemistry Parameters - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Batch 11E0195 - No Prep - Wet Chem											
Matrix Spike Dup (11E0195-MSD2)		**Source: L11E128-01**			Prepared & Analyzed: 05/25/11						
Ammonia as N	0.973	0.0100	0.0500	mg/L	1.00	U	97.3	90-110	1.03	20	
Batch 11E0209 - No Prep - Wet Chem											
Blank (11E0209-BLK1)					Prepared & Analyzed: 05/27/11						
Total Dissolved Solids	19.0	19.0	25.0	mg/L							U
LCS (11E0209-BS1)					Prepared & Analyzed: 05/27/11						
Total Dissolved Solids	12200	76.0	100	mg/L	13200		92.6	80-120			
Duplicate (11E0209-DUP1)		**Source: L11E174-01**			Prepared & Analyzed: 05/27/11						
Total Dissolved Solids	22400	190	250	mg/L		22700			1.46	10	
Duplicate (11E0209-DUP2)		**Source: L11E128-01**			Prepared & Analyzed: 05/27/11						
Total Dissolved Solids	628	19.0	25.0	mg/L		611			2.74	10	
Batch 11F0028 - No Prep - Wet Chem											
Blank (11F0028-BLK1)					Prepared & Analyzed: 06/03/11						
Alkalinity, Total (CaCO3)			1.00	mg/L							U
Alkalinity, Phenolphthalein			1.00	mg/L							U
Alkalinity - Hydroxide			1.00	mg/L							U
Alkalinity - Bicarbonate			1.00	mg/L							U
Alkalinity - Carbonate			1.00	mg/L							U
Carbon Dioxide, Total	1.00	1.00	1.00	mg/L							U

General Chemistry Parameters - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Batch 11F0028 - No Prep - Wet Chem											
LCS (11F0028-BS1)					Prepared & Analyzed: 06/03/11						
Alkalinity, Total (CaCO3)	100		1.00	mg/L	100		100	90-110			
Matrix Spike (11F0028-MS1)		Source: L11E128-01			Prepared & Analyzed: 06/03/11						
Alkalinity, Total (CaCO3)	221		1.00	mg/L	50.0	171	100	90-110			
Matrix Spike Dup (11F0028-MSD1)		Source: L11E128-01			Prepared & Analyzed: 06/03/11						
Alkalinity, Total (CaCO3)	221		1.00	mg/L	50.0	171	100	90-110	0.00	20	
Batch 11F0029 - No Prep - Wet Chem											
Blank (11F0029-BLK1)					Prepared & Analyzed: 06/03/11						
Chloride	0.0200	0.0200	0.500	mg/L							U
Fluoride	0.0100	0.0100	0.0500	mg/L							U
Sulfate	0.500	0.500	2.00	mg/L							U
LCS (11F0029-BS1)					Prepared & Analyzed: 06/03/11						
Chloride	9.67	0.0200	0.500	mg/L	10.0		96.7	90-110			
Sulfate	10.3	0.500	2.00	mg/L	10.0		103	90-110			
Fluoride	0.900	0.0100	0.0500	mg/L	1.00		90.0	90-110			
Matrix Spike (11F0029-MS1)		Source: L11E128-01			Prepared & Analyzed: 06/03/11						
Chloride	168	0.0400	1.00	mg/L	10.0	156	119	90-110			J-
Fluoride	1.30	0.0200	0.100	mg/L	1.00	0.470	83.0	90-110			J-
Sulfate	113	1.00	4.00	mg/L	10.0	102	113	90-110			J-
Matrix Spike Dup (11F0029-MSD1)		Source: L11E128-01			Prepared & Analyzed: 06/03/11						
Chloride	169	0.0400	1.00	mg/L	10.0	156	133	90-110	0.830	20	J-
Sulfate	114	1.00	4.00	mg/L	10.0	102	122	90-110	0.800	20	J-
Fluoride	1.29	0.0200	0.100	mg/L	1.00	0.470	82.2	90-110	0.617	20	J-

General Chemistry Parameters - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Batch 11F0031 - No Prep - Wet Chem											
Blank (11F0031-BLK1)					Prepared & Analyzed: 06/03/11						
Nitrate + Nitrite Nitrogen (NOX)	0.100	0.100	0.500	mg/L							U
LCS (11F0031-BS1)					Prepared & Analyzed: 06/03/11						
Nitrate + Nitrite Nitrogen (NOX)	0.993	0.100	0.500	mg/L	1.00		99.3	90-110			
Matrix Spike (11F0031-MS1)		**Source: L11E030-01**			Prepared & Analyzed: 06/03/11						
Nitrate + Nitrite Nitrogen (NOX)	2.00	0.200	1.00	mg/L	2.00	U	100	90-110			
Matrix Spike (11F0031-MS2)		**Source: L11F009-02**			Prepared & Analyzed: 06/03/11						
Nitrate + Nitrite Nitrogen (NOX)	2.00	0.200	1.00	mg/L	2.00	U	99.9	90-110			
Matrix Spike Dup (11F0031-MSD1)		**Source: L11E030-01**			Prepared & Analyzed: 06/03/11						
Nitrate + Nitrite Nitrogen (NOX)	2.00	0.200	1.00	mg/L	2.00	U	100	90-110	0.00	20	
Matrix Spike Dup (11F0031-MSD2)		**Source: L11F009-02**			Prepared & Analyzed: 06/03/11						
Nitrate + Nitrite Nitrogen (NOX)	1.99	0.200	1.00	mg/L	2.00	U	99.5	90-110	0.401	20	
Batch 11F0039 - Digestion											
LCS (11F0039-BS1)					Prepared & Analyzed: 06/09/11						
Total Kjeldahl Nitrogen	1.27	0.0500	0.250	mg/L	1.25		102	90-110			
Matrix Spike (11F0039-MS1)		**Source: L11E128-02**			Prepared & Analyzed: 06/09/11						
Total Kjeldahl Nitrogen	5.87	0.0500	0.250	mg/L	5.00	1.04	96.5	90-110			
Matrix Spike (11F0039-MS2)		**Source: L11F009-02**			Prepared & Analyzed: 06/09/11						
Total Kjeldahl Nitrogen	5.65	0.0500	0.250	mg/L	5.00	0.479	103	90-110			

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.

General Chemistry Parameters - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Batch 11F0039 - Digestion											
Matrix Spike Dup (11F0039-MSD1)		**Source: L11E128-02**			Prepared & Analyzed: 06/09/11						
Total Kjeldahl Nitrogen	5.86	0.0500	0.250	mg/L	5.00	1.04	96.3	90-110	0.171	20	
Matrix Spike Dup (11F0039-MSD2)		**Source: L11F009-02**			Prepared & Analyzed: 06/09/11						
Total Kjeldahl Nitrogen	5.62	0.0500	0.250	mg/L	5.00	0.479	103	90-110	0.586	20	

COD - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Batch 110820 - SM 5220											
Blank (110821-3)					Prepared & Analyzed: 06/02/11						
Chemical Oxygen Demand	10	10	20	mg/L				-			U
LCS (110821-4)					Prepared & Analyzed: 06/02/11						
Chemical Oxygen Demand	49.2	10	20	mg/L	50.0		98	90-110			
Matrix Spike (110821-6)		**Source: 660-110821-5**			Prepared & Analyzed: 06/02/11						
Chemical Oxygen Demand	84.2	10	20	mg/L	50.0		96	90-110			
Matrix Spike Dup (110821-7)		**Source: 660-110821-5**			Prepared & Analyzed: 06/02/11						
Chemical Oxygen Demand	84.2	10	20	mg/L	50.0		96	90-110	0	20	

SM 4500-S-D - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Batch 51255 - No Prep											
MB (743214)					Prepared:	Analyzed: 05/26/11					**Ua**
Sulfide	0.0062		0.05	mg/L				-			
LCS (743217)		**Source: 743214**			Prepared:	Analyzed: 05/26/11					
Sulfide	0.48		0.05	mg/L	0.5	0.0062U	96	90-110			
MS (743218)		**Source: L11E128-01**			Prepared:	Analyzed: 05/26/11					
Sulfide	0.47		0.05	mg/L	0.5	0.010I	93	90-110			
MSD (743219)		**Source: L11E128-01**			Prepared:	Analyzed: 05/26/11					
Sulfide	0.48		0.05	mg/L	0.5	0.010I	93	90-110			

SM 5210B - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Batch 51103 - No Prep											
MB (742342)					Prepared:	Analyzed: 05/25/11					**Ua**
Biochemical Oxygen Demand	2		2	mg/L O2				-			
LCS (742343)		**Source: 742342**			Prepared:	Analyzed: 05/25/11					
Biochemical Oxygen Demand	190		2	mg/L O2	200	2.0U	98	84.6-115.4			
DUP (742344)		**Source: T1106849001**			Prepared:	Analyzed: 05/25/11					**Ua**
Biochemical Oxygen Demand	2		2	mg/L O2		2.0U		-			

TECO TAMPA ELECTRIC

Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 * Ph (813)630-7490 * Fax (813)630-7360 * DOH #E54272

SM 9215B - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
Batch 51599 - No Prep											
MB (745194)					Prepared: Analyzed: 05/24/11						**Ua**
Heterotrophic Plate Count	1		1	Col/1mL				-			

Tampa Electric Company, Laboratory Services

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Peggy Penner, Manager, Laboratory Services

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.

Velasco, Robert A.

From:	Al Brown <al.brown@midwesttowers.com>
Sent:	Friday, September 16, 2011 12:59 PM
To:	Velasco, Robert A.
Cc:	reggie.hewatt@midwesttowers.com
Subject:	Drift Rate for XF-75-ID
Attachments:	Albert Brown.vcf; XF-75_spec.pdf

Mr. Velasco,
I received a message that you had called our Oklahoma office regarding the drift rate of the Brentwood XF-75-ID integrated fill/drift eliminators that Midwest Towers will be providing with the new Unit #2 Cooling Tower. I have attached the spec sheet for the XF-75 fill, and although the drift rate is not stated, the drift rate is specified by the manufacturer at .005%.

The proposal states this on page 37, however the rates for the options are wrong. Section 3.2. on page 37 should read:

3.2.7 Drift Eliminators

Drift eliminators shall be multi-pass type to limit drift to a maximum guaranteed value 0.005% of the cooling water flow to the tower and designed to drain water back to the cold water basin. Drift eliminators shall be integral with tower fill. *We are providing integral drift eliminators as specified. The integral eliminators will provide a drift loss rate of 0.005%. If 0.0005% is required, the use of XF-080 eliminators will be required at an extra cost.*

If you have any questions about this project, or anything else related to cooling tower related, please don't hesitate to call or email me.

Regards,
Al Brown

Midwest TOWERS, INC

Al Brown
Regional Sales Manager
3630 Fyfield Ct
Land O Lakes, Fl 34638
Cell: (813) 433-3690
Fax: (813) 388-5766
Email: al.brown@midwesttowers.com
Please visit our website at www.midwesttowers.com

ACCU-PAC® SURFACE MEDIA

XF-75 Crossflow Cooling Tower Fill

PRODUCT SPECIFICATION

1. Scope:
   ACCU-PAC® XF-75, XF75IL and XF-75ID modular film fill designed to replace OEM hanging crossflow fill sheets in crossflow cooling towers serving HVAC, light industrial and other process cooling requirements.

2. Material of Construction:
   A. General
   The fill shall be fabricated from rigid, thermoformed PVC sheets that are UV protected and meet the requirements of the CTI standard for rigid PVC, STD-136. The fill modules shall be resistant to rot, fungi, bacteria and inorganic/organic acids and alkalies as commonly found in cooling towers.

   B. PVC SHEETS
   The PVC sheet shall be prime, rigid PVC conforming to commercial standard ASTM D1784:12454B with the following properties:

PROPERTIES	ASTM TEST METHOD	UNIT		VALUE (min. unless otherwise noted)	
		IP	SI	IP	SI
Specific Gravity	D792	Dimensionless		1.45 max.	
Tensile Strength	D638/D882	psi	mPa	6,000	41.4
Flexural Modulus	D790	psi	mPa	425,000	2931
Flexural Strength	D790	psi	mPa	11,000	75.9
Elastic Modulus	D638/D882	psi	mPa	360,000	2,483
Izod Impact	D256	ft-lbs/in	j/cm	1.0	0.534
Impact Resistance	D4226	in-lbs/mil	j/mm	1.2	5.34
Heat Deflection	D648	°F	°C	160	71
Flame Spread Rating	E-84	Dimensionless		less than 20	
Flammability	D635			Self-extinguishing <5 sec.	

C. Chemical Resistance

Resistance to Grease Fats, & Oils	Excellent	ASTM D722-45
Resistance to Acids	Excellent	ASTM D543
Resistance to Alkalies	Excellent	ASTM D543

D. Temperature Resistance

Material of Construction	Max. Continuous Operating Temperature		Max. Peak Temp.*	
	F	C	F	C
PVC	120	49	125	52
HPVC	130	54	135	57
* Duration of peak temperatures not to exceed 1 hour				

The PVC sheets shall be of uniform thickness and free from holes, air bubbles, foreign matter, undispersed raw material or other manufacturing defects, which may adversely effect its performance.

E. Fill Modules

The fill modules shall be fabricated from PVC sheets of quality stated above and have a herringbone-type microstructure designed to promote full wetting of the heat transfer surfaces in all air velocities & water loadings typically found in crossflow cooling towers. The sheet spacing shall be 0.75 inches (19 mm).

The fill shall be available in either 12 inch (305mm) or 24 inch (610mm) air travel depth, measure up to 12 inches (305mm) wide, and be available up to 12 feet (3660mm) long and provide a minimum surface area of 51 ft^2/ft^3 (167.3 m^2/m^3). Standard thickness shall be 10 mil (0.25mm) or 15 mil (0.38mm) nominal thickness *after forming*.

A variety of air travel depths can be arranged from 24 inch (610mm) to 72 inch (1830mm) using a combination of the louver, fill & drift eliminator packs.

The self-supporting fill modules shall be made from sheets having a specific number of stand-offs formed onto each sheet. These stand-offs shall be bonded together to provide a finite number of contact points to form strong fill modules and be fully edge bonded. Fill modules made using adhesives or solvent cements, which adversely affect the integrity of the sheet, should be limited to the application only on contact areas between sheets. Random or roll coating of adhesives shall not be allowed.

The integral drift eliminator pack shall have drift eliminators with three impact zones for efficient drift droplet removal, an upward discharge flute angle and integral drainage channels for efficient draining of the collected drift. The drift eliminator discharge angle shall not be less than 45° from the horizontal.

The integral louver pack shall have louvers with a minimum louver angle of 40° on a standard 5° bevel pack to prevent water leakage during low airflow conditions. Integral louver packs with louver angles less than 40° can contribute to icing during low temperature operation with fans off or set at low speed.

3. Installation:

The fill shall be installed per Brentwood guidelines as described in pertinent application notes and drawings. The following general guidelines shall also apply:

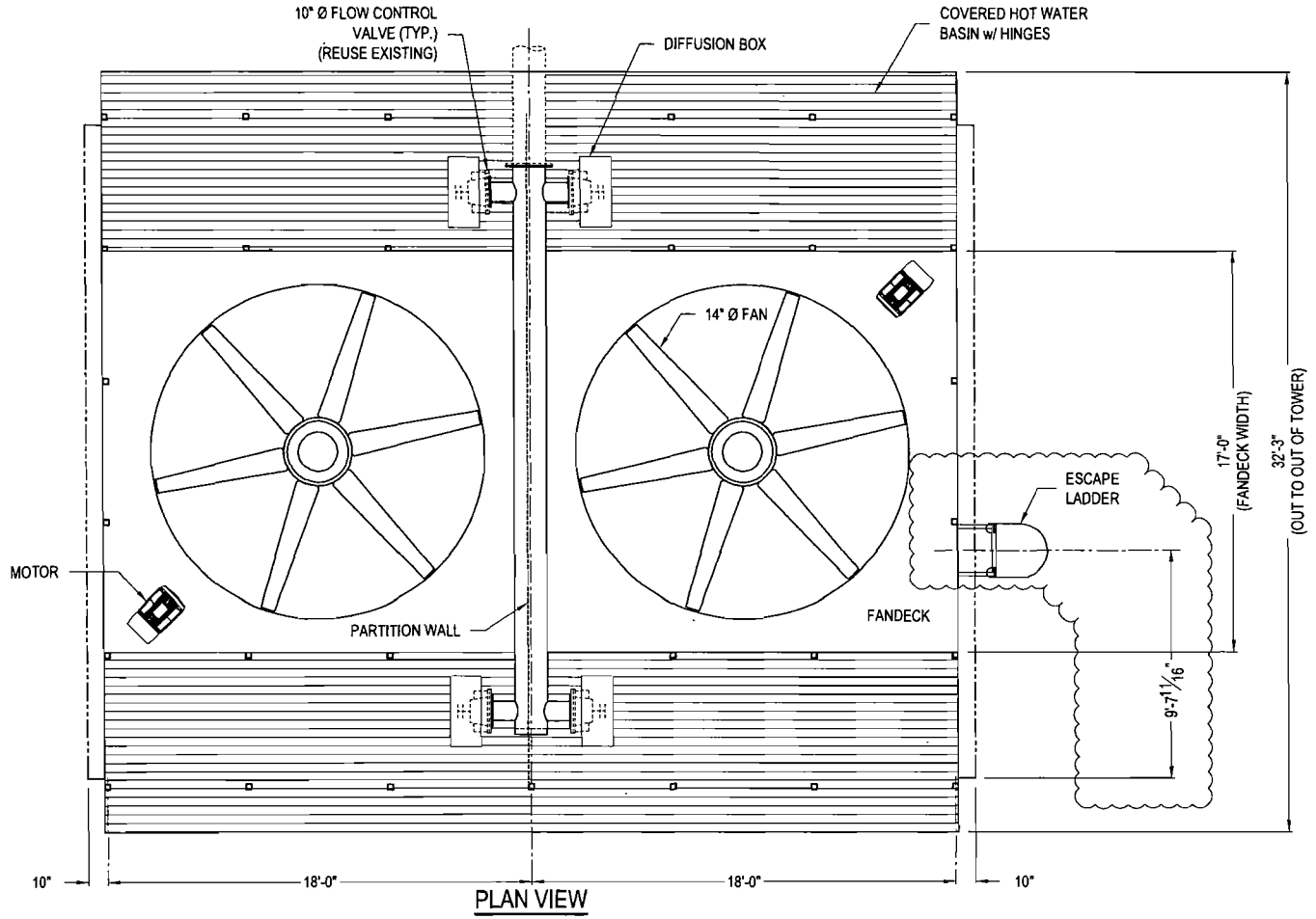
A. The fill modules shall be carefully cut or trimmed to fit within 1/8 inch (or less) of any obstructions, partition walls or side walls to prevent air bypass.

B. The fill shall be conveyed to the tower using careful handling procedures to not damage or crush the honeycomb edges.

C. Cutting and trimming of the fill modules in the tower should be done in such a manner as to not allow any chips, broken pieces or debris from falling into the fill. All fill modules shall be cleared of any such material before a new layer of fill is added.

D. Modules shall be packed tightly in the tower with the positioning tabs fully engaged from one module to another yielding a continuous honeycomb appearance to the completed installation.

E. The fill supports must be positioned as indicated in drawing CTPGA-020 and suitable retainers must be used in the front and back of the packed section to prevent shifting of the modules during normal operation of the tower.



PLAN VIEW

NORTH

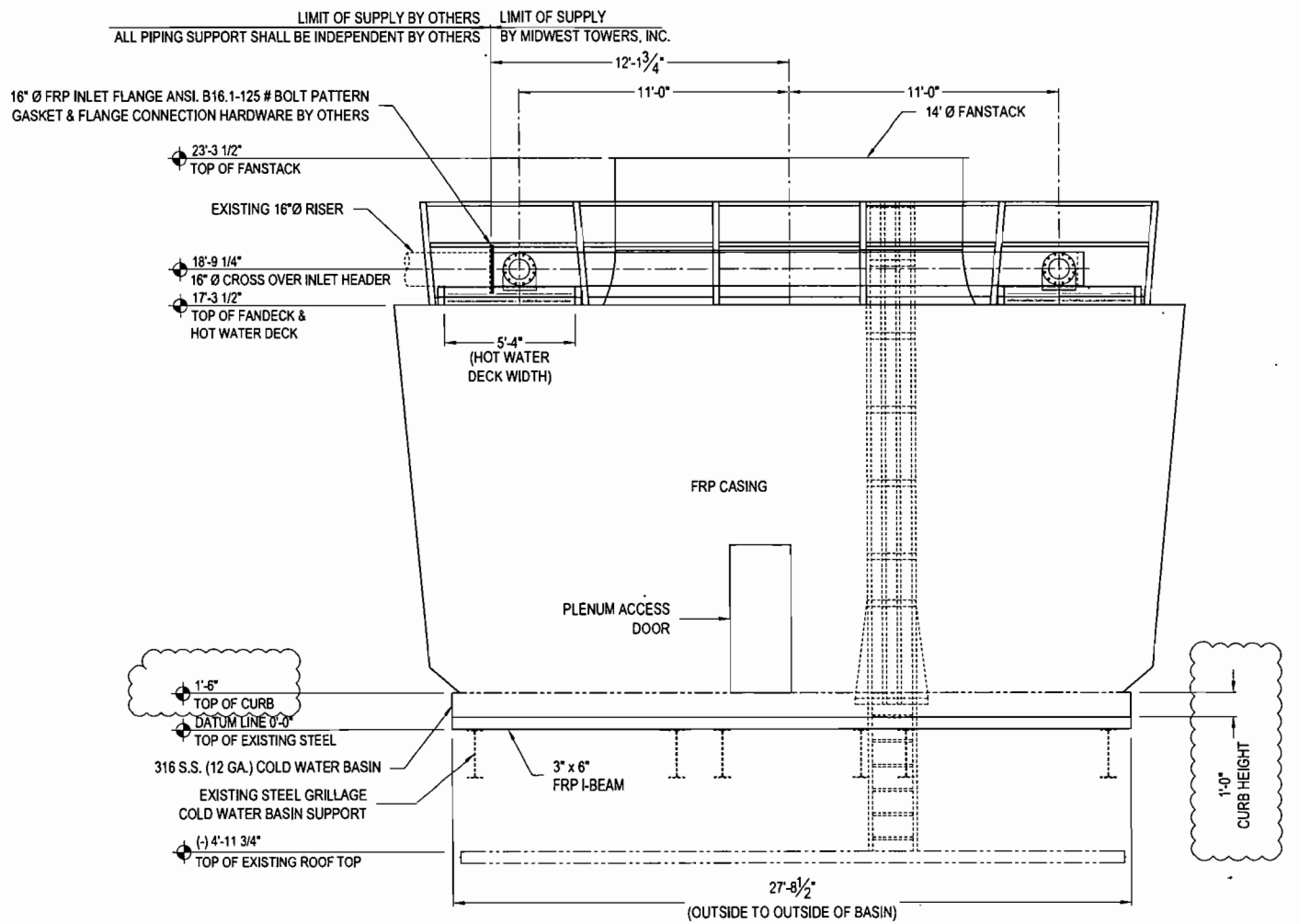
THIS DRAWING (AND THE INFORMATION ON IT) IS CONFIDENTIAL AND IS THE PROPERTY OF MIDWEST TOWERS INC. IT MAY NOT BE USED FOR DESIGN, PRODUCTION, INSTALLATION OR OPERATION WITHOUT WRITTEN CONSENT BY MIDWEST TOWERS INC.

REV	DATE	REV'D BY		CHK'D	APPR'V'D
1	8-29-11	TTH	AS SHOWN		
0	8/17/11	MKW	ISSUE FOR REVIEW & APPROVAL		

Midwest Towers, Inc.
CHICKASHA, OKLAHOMA

TAMPA ELECTRIC COMPANY
BIG BEND STATION UNIT 2 - TAMPA, FL.
27' T x 18' L 2 CELL FRP CROSSFLOW COOLING TOWER
GENERAL ARRANGEMENT
MIDWEST TOWERS PROPOSAL # 11N1419

SCALE:	DATE: 8/16/11	SHEET: 1 OF 3
NTS	DRAWN BY: MKW	DWG # A110



TRANSVERSE VIEW

REV	DATE	REV'D BY		CHK'D	APPR'D
1	8-29-11	TTH	AS SHOWN		
0	8/17/11	MKW	ISSUE FOR REVIEW & APPROVAL		

Midwest Towers, Inc.
CHICKASHA, OKLAHOMA

TAMPA ELECTRIC COMPANY
BIG BEND STATION UNIT 2 - TAMPA, FL.
27' T x 18' L 2 CELL FRP CROSSFLOW COOLING TOWER
GENERAL ARRANGEMENT
MIDWEST TOWERS PROPOSAL # 11N1419

SCALE:	DATE: 8/16/11	SHEET: 2 OF 3
NTS	DRAWN BY: MKW	DWG # A110

PM EMISSIONS - WET COOLING TOWERS

Big Bend Power Station
Tampa Electric Company, Facility ID No. 0570039

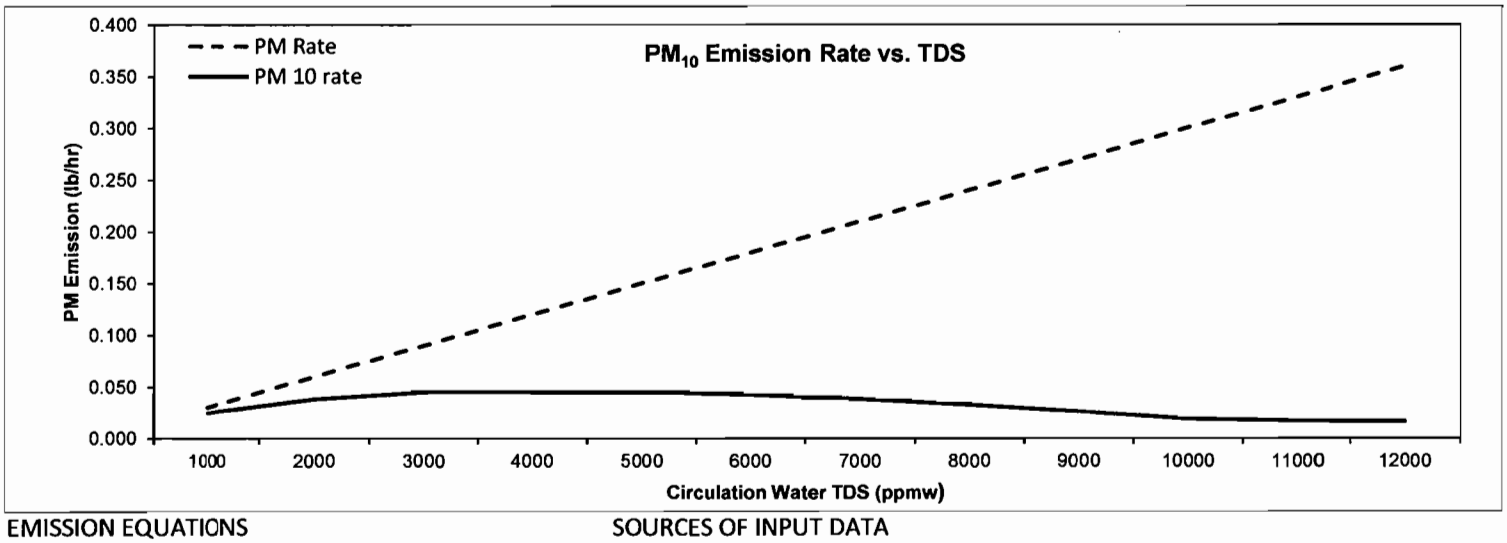
INPUT DATA AND EMISSION CALCULATIONS

Emission Source Description	Existing Unit 1 wet cooling tower
Emission Control Methods	Drift eliminators
Emission Points	Cooling drift

INPUT DATA AND EMISSION CALCULATIONS

Water droplet density	1	g/cm^3	PM emission	0.06	lb/hr
Solid particle density	2.2	g/cm^3		0.283	ton/yr
Total Dissolved Solids (TDS)	2,150	ppmw	PM_{10} emission	0.0393	lb/hr
Drift rate	0.001	%		0.172	ton/yr
Water circulation rate	6,000	gpm			

EPRI Droplet (μm)	Droplet Volume (μm^3) [2]	Droplet Mass (μg) [3]	Particle Mass Solids (μg) [4]	Solid Particle (μm^3)	Solid Particle (μm) [7]	EPRI % Mass Smaller
10	524	5.24E-04	1.13E-06	0.51	0.992	0.000
20	4189	4.19E-03	9.01E-06	4.09	1.985	0.196
30	14137	1.41E-02	3.04E-05	13.82	2.977	0.226
40	33510	3.35E-02	7.20E-05	32.75	3.969	0.514
50	65450	6.54E-02	1.41E-04	63.96	4.962	1.816
60	113097	1.13E-01	2.43E-04	110.53	5.954	5.702
70	179594	1.80E-01	3.86E-04	175.51	6.947	21.348
90	381704	3.82E-01	8.21E-04	373.03	8.931	49.812
110	696910	6.97E-01	1.50E-03	681.07	10.916	70.509
130	1150347	1.15E+00	2.47E-03	1124.20	12.901	82.023
150	1767146	1.77E+00	3.80E-03	1726.98	14.885	88.012
180	3053628	3.05E+00	6.57E-03	2984.23	17.863	91.032
210	4849048	4.85E+00	1.04E-02	4738.84	20.840	92.468
240	7238229	7.24E+00	1.56E-02	7073.72	23.817	94.091
270	10305995	1.03E+01	2.22E-02	10071.77	26.794	94.689
300	14137167	1.41E+01	3.04E-02	13815.87	29.771	96.288
350	22449298	2.24E+01	4.83E-02	21939.09	34.733	97.011
400	33510322	3.35E+01	7.20E-02	32748.72	39.695	98.340
450	47712938	4.77E+01	1.03E-01	46628.55	44.656	99.071
500	65449847	6.54E+01	1.41E-01	63962.35	49.618	99.071
600	113097336	1.13E+02	2.43E-01	110526.94	59.542	100.000



EMISSION EQUATIONS

[2] Volume of drift droplet	$V = 4/3\ \pi(D_p/2)^3$
[3] Mass of solids in drift droplet	TDS x ρ_w x V
[4] Mass of solids	ρ_{TDS} x V
[7] Diameter of drift droplet	$D_d[(TDS)(\rho_w/\rho_{TDS})]^{1/3}$

SOURCES OF INPUT DATA

Circulation Rate	6,000 gpm - Vendor specifications
Drift Rate %	0.001% - Brentwood Model XF150MAX
TDS Concentration	2,150 mg/L - effluent quality/3.5 cycles of conc.
PM Calculation	AP 42 Chapter 13.4 Wet Cooling Towers (latest Ed.)
PM_{10} Calculation	Reisman, J. and Frisbie, G. , Calculating Realistic PM_{10} Emissions from Cooling Towers, Technical Proceedings Air Waste Management Association, June 2001.

NOTES AND OBSERVATIONS
PM_{10}/PM ratio based on a conservative 0.0006% drift rate

PM EMISSIONS - WET COOLING TOWERS

Big Bend Power Station
Tampa Electric Company, Facility ID No. 0570039

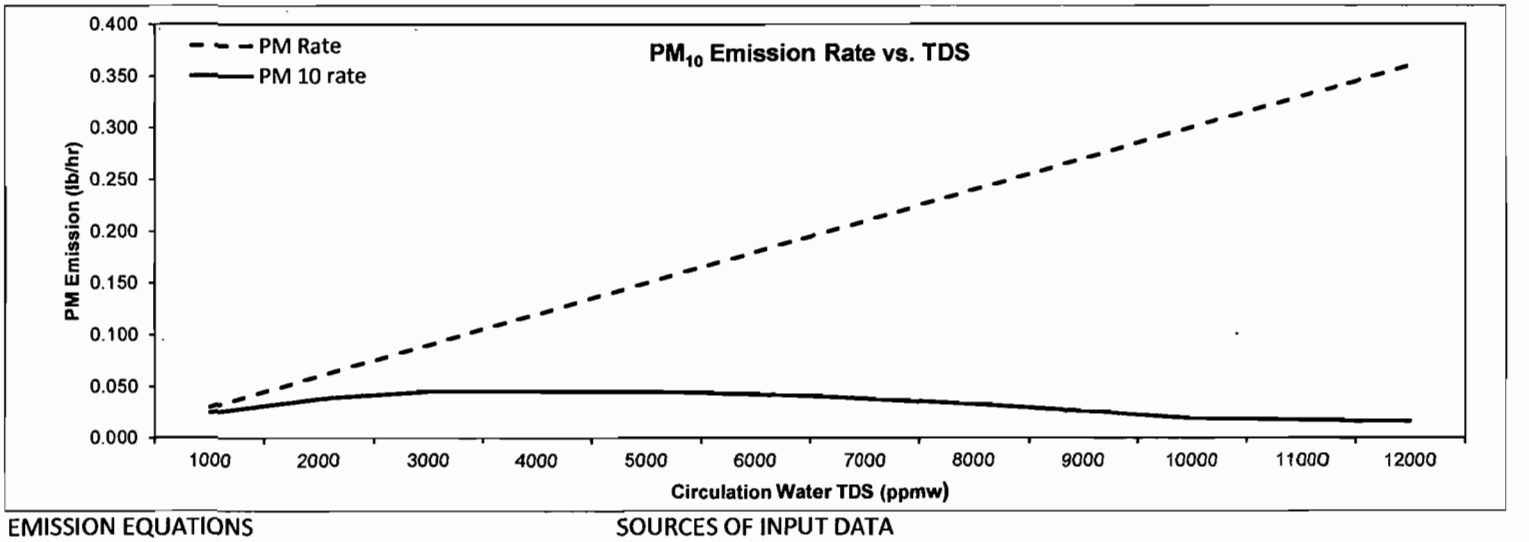
INPUT DATA AND EMISSION CALCULATIONS

Emission Source Description	Existing Unit 2 wet cooling tower
Emission Control Methods	Drift eliminators
Emission Points	Cooling drift

INPUT DATA AND EMISSION CALCULATIONS

Water droplet density	1	g/cm^3	PM emission	0.06	lb/hr
Solid particle density	2.2	g/cm^3		0.283	ton/yr
Total Dissolved Solids (TDS)	2,150	ppmw	PM_{10} emission	0.0393	lb/hr
Drift rate	0.001	%		0.172	ton/yr
Water circulation rate	6,000	gpm			

EPRI Droplet (μm)	Droplet Volume (μm^3) [2]	Droplet Mass (μg) [3]	Particle Mass Solids (μg) [4]	Solid Particle (μm^3)	Solid Particle (μm) [7]	EPRI % Mass Smaller
10	524	5.24E-04	1.13E-06	0.51	0.992	0.000
20	4189	4.19E-03	9.01E-06	4.09	1.985	0.196
30	14137	1.41E-02	3.04E-05	13.82	2.977	0.226
40	33510	3.35E-02	7.20E-05	32.75	3.969	0.514
50	65450	6.54E-02	1.41E-04	63.96	4.962	1.816
60	113097	1.13E-01	2.43E-04	110.53	5.954	5.702
70	179594	1.80E-01	3.86E-04	175.51	6.947	21.348
90	381704	3.82E-01	8.21E-04	373.03	8.931	49.812
110	696910	6.97E-01	1.50E-03	681.07	10.916	70.509
130	1150347	1.15E+00	2.47E-03	1124.20	12.901	82.023
150	1767146	1.77E+00	3.80E-03	1726.98	14.885	88.012
180	3053628	3.05E+00	6.57E-03	2984.23	17.863	91.032
210	4849048	4.85E+00	1.04E-02	4738.84	20.840	92.468
240	7238229	7.24E+00	1.56E-02	7073.72	23.817	94.091
270	10305995	1.03E+01	2.22E-02	10071.77	26.794	94.689
300	14137167	1.41E+01	3.04E-02	13815.87	29.771	96.288
350	22449298	2.24E+01	4.83E-02	21939.09	34.733	97.011
400	33510322	3.35E+01	7.20E-02	32748.72	39.695	98.340
450	47712938	4.77E+01	1.03E-01	46628.55	44.656	99.071
500	65449847	6.54E+01	1.41E-01	63962.35	49.618	99.071
600	113097336	1.13E+02	2.43E-01	110526.94	59.542	100.000



EMISSION EQUATIONS

[2] Volume of drift droplet	$V = 4/3\ \pi(D_p/2)^3$
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[4] Mass of solids	ρ_{TDS} x V
[7] Diameter of drift droplet	$D_d[(TDS)(\rho_w/\rho_{TDS})]^{1/3}$

SOURCES OF INPUT DATA

Circulation Rate	6,000 gpm - Vendor specifications
Drift Rate %	0.001% - Brentwood Model XF150MAX
TDS Concentration	2,150 mg/L - effluent quality/3.5 cycles of conc.
PM Calculation	AP 42 Chapter 13.4 Wet Cooling Towers (latest Ed.)
PM_{10} Calculation	Reisman, J. and Frisbie, G. , Calculating Realistic PM_{10} Emissions from Cooling Towers, Technical Proceedings Air Waste Management Association, June 2001.

NOTES AND OBSERVATIONS
PM_{10}/PM ratio based on a conservative 0.0006% drift rate

PM EMISSIONS - WET COOLING TOWERS

Big Bend Power Station
Tampa Electric Company, Facility ID No. 0570039

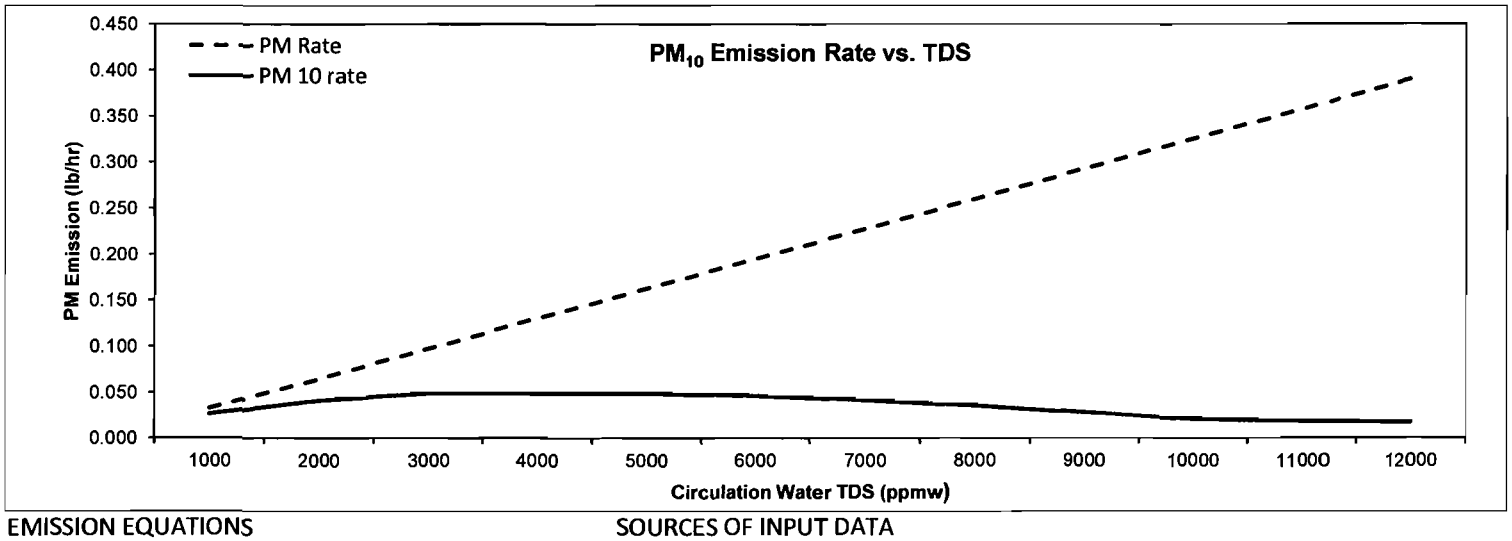
INPUT DATA AND EMISSION CALCULATIONS

Emission Source Description	Existing Unit 3 wet cooling tower
Emission Control Methods	Drift eliminators
Emission Points	Cooling drift

INPUT DATA AND EMISSION CALCULATIONS

Water droplet density	1	g/cm^3	PM emission	0.07	lb/hr
Solid particle density	2.2	g/cm^3		0.306	ton/yr
Total Dissolved Solids (TDS)	2,150	ppmw	PM_{10} emission	0.0426	lb/hr
Drift rate	0.001	%		0.187	ton/yr
Water circulation rate	6,500	gpm			

EPRI Droplet (μm)	Droplet Volume (μm^3) [2]	Droplet Mass (μg) [3]	Particle Mass Solids (μg) [4]	Solid Particle (μm^3)	Solid Particle (μm) [7]	EPRI % Mass Smaller
10	524	5.24E-04	1.13E-06	0.51	0.992	0.000
20	4189	4.19E-03	9.01E-06	4.09	1.985	0.196
30	14137	1.41E-02	3.04E-05	13.82	2.977	0.226
40	33510	3.35E-02	7.20E-05	32.75	3.969	0.514
50	65450	6.54E-02	1.41E-04	63.96	4.962	1.816
60	113097	1.13E-01	2.43E-04	110.53	5.954	5.702
70	179594	1.80E-01	3.86E-04	175.51	6.947	21.348
90	381704	3.82E-01	8.21E-04	373.03	8.931	49.812
110	696910	6.97E-01	1.50E-03	681.07	10.916	70.509
130	1150347	1.15E+00	2.47E-03	1124.20	12.901	82.023
150	1767146	1.77E+00	3.80E-03	1726.98	14.885	88.012
180	3053628	3.05E+00	6.57E-03	2984.23	17.863	91.032
210	4849048	4.85E+00	1.04E-02	4738.84	20.840	92.468
240	7238229	7.24E+00	1.56E-02	7073.72	23.817	94.091
270	10305995	1.03E+01	2.22E-02	10071.77	26.794	94.689
300	14137167	1.41E+01	3.04E-02	13815.87	29.771	96.288
350	22449298	2.24E+01	4.83E-02	21939.09	34.733	97.011
400	33510322	3.35E+01	7.20E-02	32748.72	39.695	98.340
450	47712938	4.77E+01	1.03E-01	46628.55	44.656	99.071
500	65449847	6.54E+01	1.41E-01	63962.35	49.618	99.071
600	113097336	1.13E+02	2.43E-01	110526.94	59.542	100.000



EMISSION EQUATIONS

[2] Volume of drift droplet	$V = 4/3\ \pi(D_p/2)^3$
[3] Mass of solids in drift droplet	TDS x ρ_w x V
[4] Mass of solids	ρ_{TDS} x V
[7] Diameter of drift droplet	$D_d[(TDS)(\rho_w/\rho_{TDS})]^{1/3}$

SOURCES OF INPUT DATA

Circulation Rate	6,500 gpm - Vendor specifications
Drift Rate %	0.001% - Brentwood Model XF150MAX
TDS Concentration	2,150 mg/L - effluent quality/3.5 cycles of conc.
PM Calculation	AP 42 Chapter 13.4 Wet Cooling Towers (latest Ed.)
PM_{10} Calculation	Reisman, J. and Frisbie, G. , Calculating Realistic PM_{10} Emissions from Cooling Towers, Technical Proceedings Air Waste Management Association, June 2001.

NOTES AND OBSERVATIONS
PM_{10}/PM ratio based on a conservative 0.0006% drift rate

PM EMISSIONS - WET COOLING TOWERS

Big Bend Power Station
Tampa Electric Company, Facility ID No. 0570039

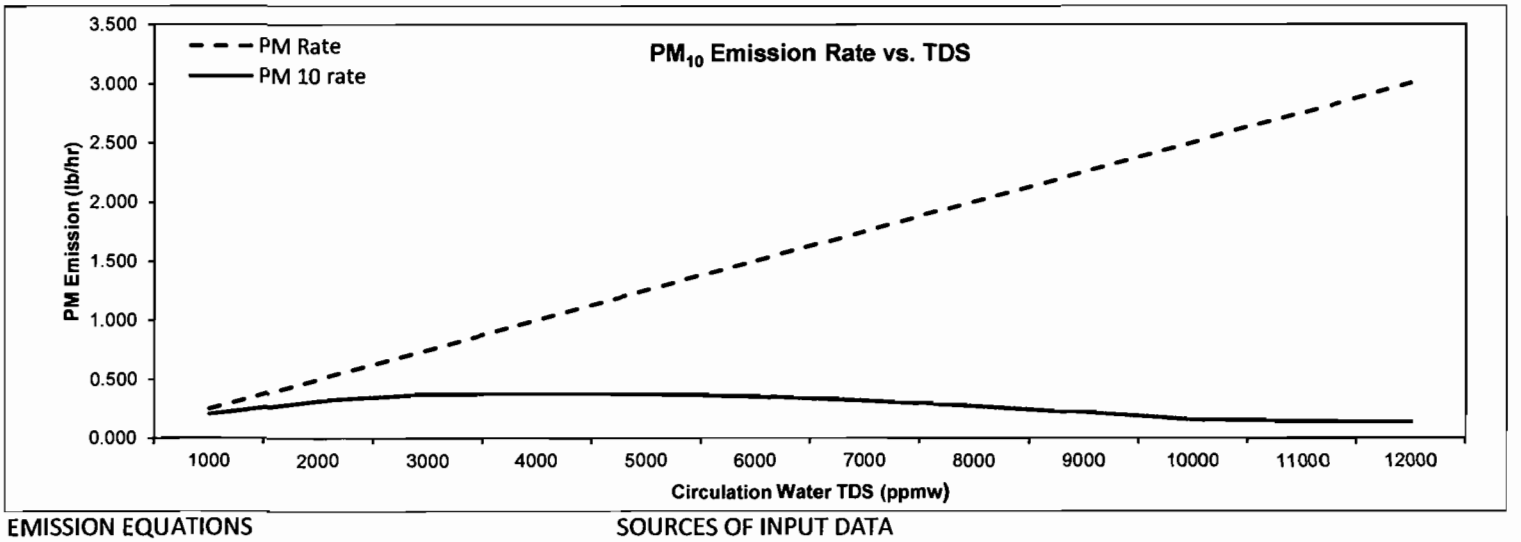
INPUT DATA AND EMISSION CALCULATIONS

Emission Source Description	Existing Unit 4 wet cooling tower
Emission Control Methods	Drift eliminators
Emission Points	Cooling drift

INPUT DATA AND EMISSION CALCULATIONS

Water droplet density	1	g/cm^3	PM emission	0.54	lb/hr
Solid particle density	2.2	g/cm^3		2.358	ton/yr
Total Dissolved Solids (TDS)	2,150	ppmw	PM_{10} emission	0.3282	lb/hr
Drift rate	0.0077	%		1.438	ton/yr
Water circulation rate	6,500	gpm			

EPRI Droplet (μm)	Droplet Volume (μm^3) [2]	Droplet Mass (μg) [3]	Particle Mass Solids (μg) [4]	Solid Particle (μm^3)	Solid Particle (μm) [7]	EPRI % Mass Smaller
10	524	5.24E-04	1.13E-06	0.51	0.992	0.000
20	4189	4.19E-03	9.01E-06	4.09	1.985	0.196
30	14137	1.41E-02	3.04E-05	13.82	2.977	0.226
40	33510	3.35E-02	7.20E-05	32.75	3.969	0.514
50	65450	6.54E-02	1.41E-04	63.96	4.962	1.816
60	113097	1.13E-01	2.43E-04	110.53	5.954	5.702
70	179594	1.80E-01	3.86E-04	175.51	6.947	21.348
90	381704	3.82E-01	8.21E-04	373.03	8.931	49.812
110	696910	6.97E-01	1.50E-03	681.07	10.916	70.509
130	1150347	1.15E+00	2.47E-03	1124.20	12.901	82.023
150	1767146	1.77E+00	3.80E-03	1726.98	14.885	88.012
180	3053628	3.05E+00	6.57E-03	2984.23	17.863	91.032
210	4849048	4.85E+00	1.04E-02	4738.84	20.840	92.468
240	7238229	7.24E+00	1.56E-02	7073.72	23.817	94.091
270	10305995	1.03E+01	2.22E-02	10071.77	26.794	94.689
300	14137167	1.41E+01	3.04E-02	13815.87	29.771	96.288
350	22449298	2.24E+01	4.83E-02	21939.09	34.733	97.011
400	33510322	3.35E+01	7.20E-02	32748.72	39.695	98.340
450	47712938	4.77E+01	1.03E-01	46628.55	44.656	99.071
500	65449847	6.54E+01	1.41E-01	63962.35	49.618	99.071
600	113097336	1.13E+02	2.43E-01	110526.94	59.542	100.000



EMISSION EQUATIONS

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[4] Mass of solids	ρ_{TDS} x V
[7] Diameter of drift droplet	$D_d[(TDS)(\rho_w/\rho_{TDS})]^{1/3}$

SOURCES OF INPUT DATA

Circulation Rate	6,500 gpm - Vendor specifications
Drift Rate %	0.0077% - Vendor guarentee rate of 0.5 gpm max.
TDS Concentration	2,150 mg/L - effluent quality/3.5 cycles of conc.
PM Calculation	AP 42 Chapter 13.4 Wet Cooling Towers (latest Ed.)
PM_{10} Calculation	Reisman, J. and Frisbie, G. , Calculating Realistic PM_{10} Emissions from Cooling Towers, Technical Proceedings Air Waste Management Association, June 2001.

NOTES AND OBSERVATIONS
PM_{10}/PM ratio based on a conservative 0.0006% drift rate

PM EMISSIONS - WET COOLING TOWERS

Big Bend Power Station
Tampa Electric Company, Facility ID No. 0570039

INPUT DATA AND EMISSION CALCULATIONS

Emission Source Description	Proposed Unit 2 wet cooling tower
Emission Control Methods	Drift eliminators
Emission Points	Cooling drift

INPUT DATA AND EMISSION CALCULATIONS

Water droplet density	1	g/cm^3	PM emission	0.32	lb/hr
Solid particle density	2.2	g/cm^3		1.414	ton/yr
Total Dissolved Solids (TDS)	2,150	ppmw	PM_{10} emission	0.1967	lb/hr
Drift rate	0.005	%		0.862	ton/yr
Water circulation rate	6,000	gpm			

EPRI Droplet (μm)	Droplet Volume (μm^3) [2]	Droplet Mass (μg) [3]	Particle Mass Solids (μg) [4]	Solid Particle (μm^3)	Solid Particle (μm) [7]	EPRI % Mass Smaller
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40	33510	3.35E-02	7.20E-05	32.75	3.969	0.514
50	65450	6.54E-02	1.41E-04	63.96	4.962	1.816
60	113097	1.13E-01	2.43E-04	110.53	5.954	5.702
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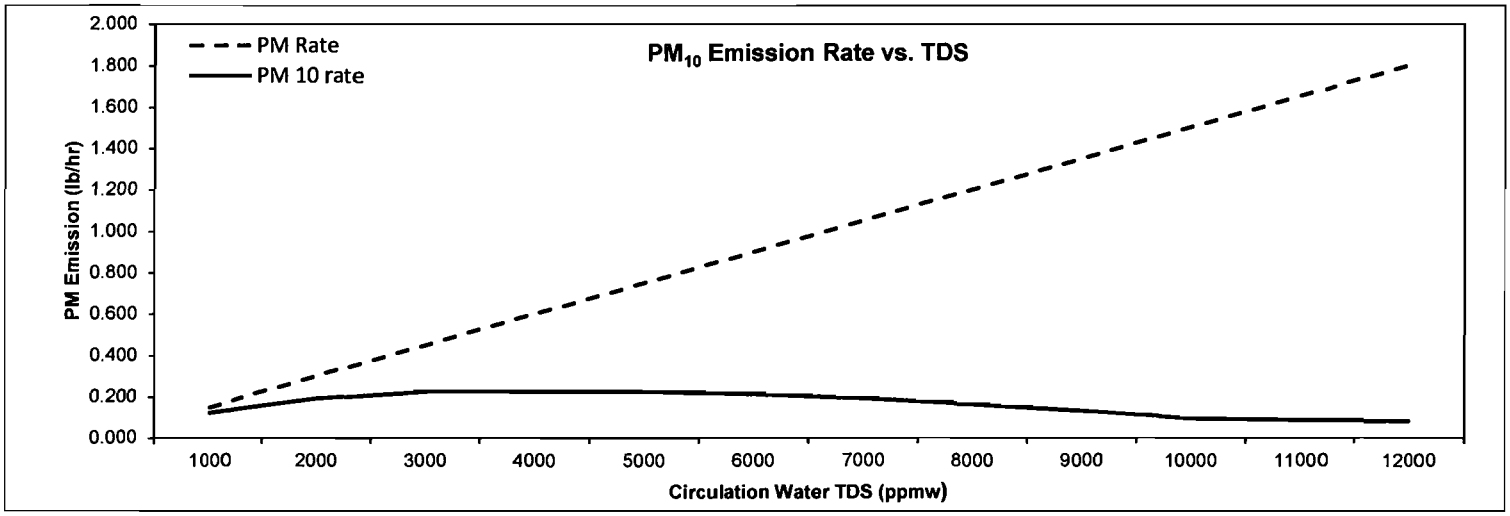

EMISSION EQUATIONS

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[7] Diameter of drift droplet	$D_d[(TDS)(\rho_w/\rho_{TDS})]^{1/3}$

SOURCES OF INPUT DATA

Circulation Rate	6,000 gpm - Vendor specifications
Drift Rate %	0.005% - Vendor guarantee
TDS Concentration	2,150 mg/L - effluent quality/3.5 cycles of conc.
PM Calculation	AP 42 Chapter 13.4 Wet Cooling Towers (latest Ed.)
PM_{10} Calculation	Reisman, J. and Frisbie, G. , Calculating Realistic PM_{10} Emissions from Cooling Towers, Technical Proceedings Air Waste Management Association, June 2001.

NOTES AND OBSERVATIONS
PM_{10}/PM ratio based on a conservative 0.0006% drift rate