



January 23, 2012

093-87652

Mr. Jeffery F. Koerner, P.E. Administrator  
Bureau of Air Regulation  
Florida Department of Environmental Protection  
2600 Blair Stone Road  
Tallahassee, FL 32399

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JAN 24 2012

DIVISION OF AIR  
RESOURCE MANAGEMENT

**RE: Turkey Point Power Plant  
Project Number 0250003-013-AC; PSD-FL-409  
Cooling Tower Project for Units 6 and 7**

Dear Mr. Koerner:

This correspondence is provided for informational purposes to supplement the Department's file on the referenced Air Construction / PSD permit and reflects additional information submitted to the Nuclear Regulatory Commission related to the deposition of cooling tower drift from the Turkey Point Units 6 & 7 Project Cooling Towers. Cooling tower drift is regulated by the FDEP as particulate matter (PM) and PM with an aerodynamic diameter of 10 microns or less. These regulated air pollutants were addressed in the above-referenced Air Construction/PSD Permit issued for the Project. In addition, the impact of cooling tower deposition was a subject of a completeness question from the Department in its review of the application (FDEP-PSD-7). This information does not change any of the air emissions estimates or air quality dispersion modeling provided in the Air Construction/PSD Permit Application. Rather, the information updates the deposition analyses to better reflect the actual conditions for which the PM emitted from the cooling towers may deposit.

The deposition modeling analyses were revised to more accurately reflect the actual physical characteristics of the drift emitted from the cooling towers. Deposition modeling was originally performed as "particulate matter" emitted from the cooling towers. The particulate matter in cooling tower drift consists of the dissolved minerals in the circulating water concentrated as a particle with a particle density reflecting that of condensed minerals. The water droplets emitted from the cooling towers are a combination of water and dissolved minerals referred to as "solution drift". The revised approach models the cooling tower drift as it is emitted, i.e., as water droplets, not as particulate matter. Solution drift particles have lower density than particulate matter since a majority of the particle is water. In contrast, the particulate matter is formed at distances downwind when the water in the droplet evaporates.

The particle size distribution for "solution drift" in the updated modeling is shown in Table 1 and the results when using saltwater are shown in Table 2. Figure 1 shows the modeling results with the cooling towers using saltwater. The updated approach in using solution drift resulted in slightly lower deposition rates near the cooling towers due to lower density of solution drift particles and slightly higher deposition rates away from the cooling towers since lower density particles travel farther. As indicated in the Air Construction/PSD Permit Application and completeness responses, saltwater is a backup supply of makeup water for the cooling towers. FPL has proposed that the use of saltwater be limited to an annual maximum quantity required for 90 days of full load operation. Therefore, the use of saltwater from the radial collector wells in the evaluation provides a conservative estimate of the maximum possible deposition impacts for the Project. The primary water source for the Project (reclaimed water) the vast majority of time has maximum deposition impacts that are 12.5 times lower the impacts for saltwater.

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Please call if there are any questions.

Sincerely,

**GOLDER ASSOCIATES INC.**



Kennard F. Kosky, P.E.  
Principal

Enclosures

cc: Steve Scroggs, FPL  
Marister Ruiz, FPL  
Paul Jacobs, FPL  
Rick Orthen, FPL  
Matt Raffenberg, FPL

**TABLE 1**  
**ESTIMATED DRIFT EMISSION SPECTRUM FOR**  
**TURKEY POINT UNITS 6 & 7 CIRCULATING WATER**  
**COOLING TOWERS**

<b>Droplet Size Range (micrometers)</b>	<b>Total in Size Range (percent)</b>
0 - 40	0.51
40 - 50	1.30
50 - 60	3.89
60 - 70	15.65
70 - 90	28.46
90 - 110	20.70
110 - 130	11.51
130 - 150	5.99
150 - 210	4.46
210 - 350	4.54
350 - 600	2.99

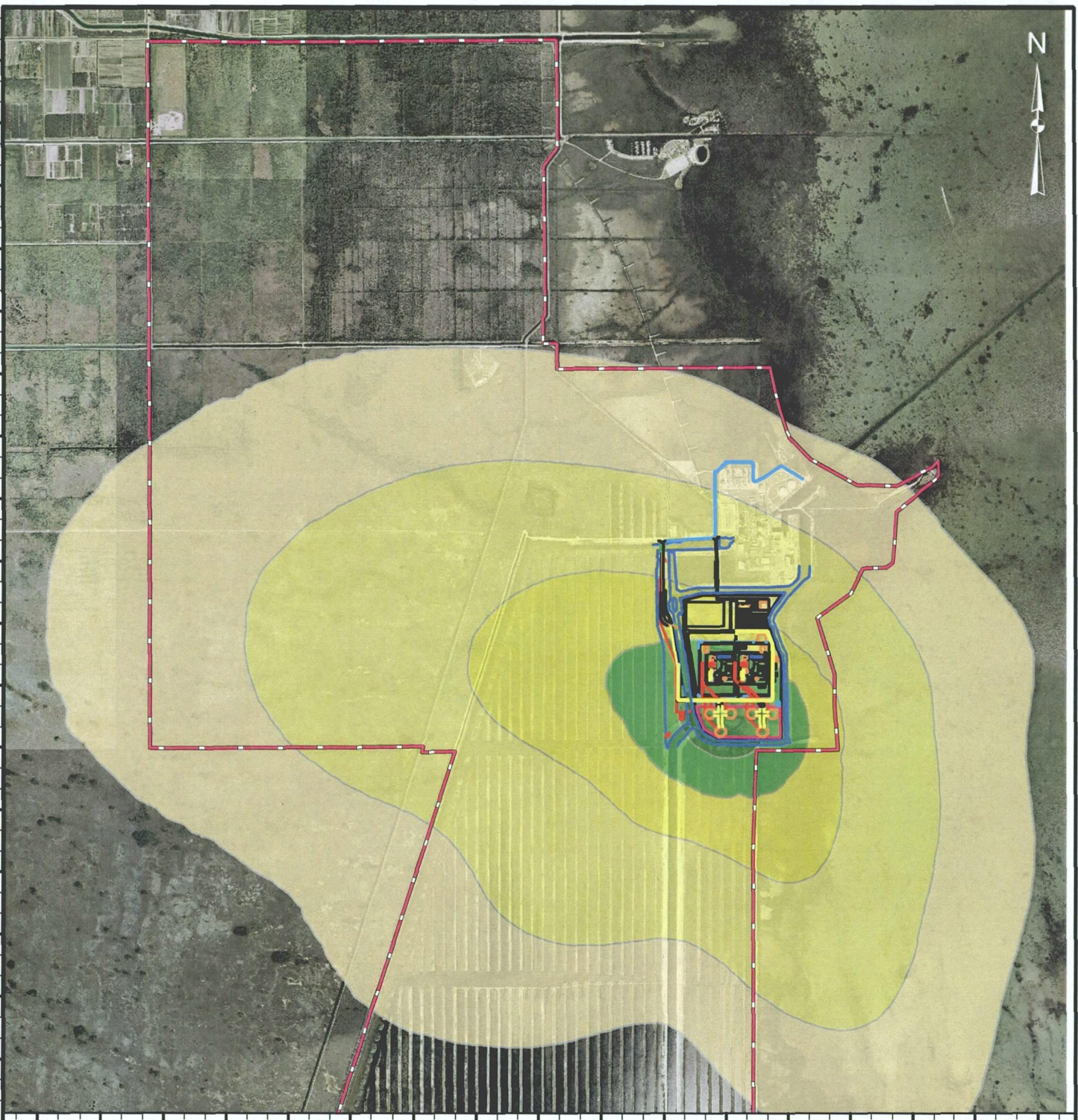
Source: "Calculating Realistic PM Emissions from Cooling Towers",  
Frisbie and Gordon, 2001.

TABLE 2

**MONTHLY MINERAL CIRCULATING WATER DEPOSITION PREDICTED  
FOR TURKEY POINT UNITS 6 & 7 COOLING TOWERS**

Period		Deposition		Location	
		<u>g/m<sup>2</sup>/month</u>	<u>kg/ha/month</u>	<u>Distance (m)</u>	<u>Direction (degree)</u>
2001-2005	Average	0.50	5.0	Area within 5 km	
	Maximum	11.5	115.0	354	225
		4.2	42.0	500	270
		2.2	22.0	1,000	270
		1.1	11.0	2,000	270
		0.6	6.0	3,000	270

280900 280950 281000 281050 281100 281150 281200 281250 281300 281350 281400 281450 281500 281550 281600 281650 281700



561500 562000 562500 563000 563500 564000 564500 565000 565500 566000 566500 567000 567500 568000 568500 569000 569500

**LEGEND**

- Turkey Point Plant Property
- Monthly Deposition (kg/ha/month)**
- 2 - 4
- 4 - 10
- 10 - 20
- 20 - 40
- 40 - 80
- >80

X, Y axis are U.T.M. coordinates in meters.



**REFERENCES**

1. Imagery, Miami-Dade County 2007.
2. Monthly Deposition, Miami-International Airport, 2001-2005.

PROJECT	TURKEY POINT UNITS 6 & 7 PROJECT	
TITLE	AVERAGE MONTHLY SALT DEPOSITION FROM CIRCULATING WATER COOLING TOWERS	
	FILE No.	08387584E001
	January 2012	
	PLOT DATE	12/1/2011
	<b>FIGURE</b>	1