KB Environmental Sciences

- MEMO -

Date: August 27, 2008

To: Bill Howell, H.W. Lochner, Inc.

From: Wayne Arner, KB Environmental Sciences, Inc.

Subject: Air Quality Memorandum for State Road (SR) 674 from US 301 to County Road (CR) 579

INTRODUCTION

The objective of this Air Quality Memorandum is to determine whether project-related motor vehicle emissions associated with the proposed improvements to SR 674 from US 301 to CR 579 in Hillsborough County will cause, or contribute to, a violation of the National Ambient Air Quality Standards (NAAQS) for carbon monoxide (CO), the most prevalent air pollutant emission from motor vehicles.

The proposed project has the potential to alter traffic conditions and influence the air quality within the project study area. The pollutants of primary concern with roadway traffic are ozone (O_3), oxides of nitrogen (NO_X), hydrocarbons (HC), small particulate matter (PM_{10}) and carbon monoxide (CO). Because CO is a localized pollutant that is emitted directly into the atmosphere by vehicles, it is analyzed for individual roadway projects where substantial changes to the traffic conditions are anticipated.

METHODOLOGY

In accordance with the Florida Department of Transportation (FDOT), Project Development and Environment (PD&E) Manual (Part 2, Chapter 16 - Air Quality Analysis), the project was subjected to a Screening Test. The computerized version of the Screening Test (CO Florida 2004) contains conservative, worst-case assumptions about meteorology, traffic, and other site conditions. CO Florida 2004 uses the worst-case assumptions in the MOBILE6 emission and CAL3QHC models to predict maximum CO concentrations at receptors near a roadway intersection. Those results are then compared to the NAAQS maximum 1-hour and 8-hour concentrations for this pollutant. The premise of this approach is that CO concentrations elsewhere along the project corridor will be lower than these worst-case screening values.

A receptor site is a place where people can reasonably be expected to spend a significant amount of time, such as the backyard of a residence. Especially sensitive receptor sites include hospitals, nursing homes, schools, and day care centers. A roadway project passes the Screening Test if the CO concentration at all reasonable receptors is less than the NAAQS.

The intersection chosen for the Screening Test is the one with the combination of highest traffic volumes, lowest vehicular speeds, and closest receptors. Traffic data were obtained from the project's Traffic Technical Memorandum for the opening year (2010) and the design year (2030).

Based on these criteria and information, the intersection selected for the Screening Test for this project was the SR 674/US 301 intersection. The intersection contains the "worst-case" leg of all signalized intersections within the project corridor for the design year. The screening test for Suburban Areas was used.

RESULTS

CO Florida 2004 calculates the maximum 1-hour and 8-hour CO concentration in parts per million (ppm). The NAAQS are 35 ppm for 1-hour and 9 ppm for 8-hours. The analysis results are summarized in **Table 1**.

Table 1.
SR 674/US 301 Intersection CO Screening Results

Year	Maximum CO Levels (ppm)		Passes Screening Test?
	NAAQS 1-hr / Project 1-hr	NAAQS 8-hour / Project 8-hr	
2010	35 / 7.5	9 / 4.5	Yes
2030	35 / 8.3	9 / 5.0	Yes

These results indicate that the project passes the screening process and no further analysis is required. Appendix A contains the CO Florida 2004 output files supporting these findings.

The SR 674 project is in an area that has been designated as attainment for all the air quality standards under the criteria provided in the Clean Air Act Amendments of 1990, therefore, conformity does not apply.

Appendix
Carbon Monoxide Screening Test Results

08-27-2008

CO Florida 2004

Project: SR 674 from US 301 to CR 579
Facility: SR 674/US 301 Interchange (Opening Year 2010)
Analyst: WHA

Environmental Data:

Temperature:	50 F
Reid Vapor Pressure:	11.5 psi
Land Use:	Suburban
Stability Class:	D
Surface Roughness:	108
Background Concentration:	1-hr = 3.3 ppm 8-hr = 2.0 ppm

Project Data:

Region:	4: Hillsborough / Pinellas
Year:	2010
Intersection Type:	6 x 4 Intersection
Max 4-Lane Traffic:	585 veh/hour
Max 6-Lane Traffic:	1168 veh/hour
4-Lane Speed:	45
6-Lane Speed:	45

Receptor Data (all distances are in feet):

Receptor Name	East-West Distance from Intersection	North-South Distance from Intersection	Receptor Height
Default Rec 1	10	150	6
Default Rec 2	10	50	6
Default Rec 3	50	10	6
Default Rec 4	150	10	6
Default Rec 5	50	50	6
Default Rec 6	10	-150	6
Default Rec 7	10	-50	6
Default Rec 8	50	-10	6
Default Rec 9	150	-10	6
Default Rec 10	50	-50	6

RESULTS (including background CO):

Receptor Name	Max 1-Hr Conc (ppm)	Max 8-Hr Conc (ppm)
Default Rec 1	5.6	3.4
Default Rec 2	6.1	3.7
Default Rec 3	7.5	4.5
Default Rec 4	7.4	4.5
Default Rec 5	5.8	3.5
Default Rec 6	5.9	3.6
Default Rec 7	7.0	4.2
Default Rec 8	6.5	3.9
Default Rec 9	5.8	3.5
Default Rec 10	5.9	3.6

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PROJECT PASSES - NO EXCEEDANCES OF NAAQ CO STANDARDS ARE PREDICTED
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07-24-2008

CO Florida 2004

Project: SR 674 from US 301 to CR 579
Facility: SR 674/US 301 Intersection (Design Year 2030)
Analyst: WHA

Environmental Data:

Temperature:	50 F
Reid Vapor Pressure:	11.5 psi
Land Use:	Suburban
Stability Class:	D
Surface Roughness:	108
Background Concentration:	1-hr = 3.3 ppm 8-hr = 2.0 ppm

Project Data:

Region:	4: Hillsborough / Pinellas
Year:	2030
Intersection Type:	6 x 4 Intersection
Max 4-Lane Traffic:	1871 veh/hour
Max 6-Lane Traffic:	2293 veh/hour
4-Lane Speed:	45
6-Lane Speed:	45

Receptor Data (all distances are in feet):

Receptor Name	East-West Distance from Intersection	North-South Distance from Intersection	Receptor Height
Default Rec 1	10	150	6
Default Rec 2	10	50	6
Default Rec 3	50	10	6
Default Rec 4	150	10	6
Default Rec 5	50	50	6
Default Rec 6	10	-150	6
Default Rec 7	10	-50	6
Default Rec 8	50	-10	6
Default Rec 9	150	-10	6
Default Rec 10	50	-50	6

RESULTS (including background CO):

Receptor Name	Max 1-Hr Conc (ppm)	Max 8-Hr Conc (ppm)
Default Rec 1	7.1	4.3
Default Rec 2	7.7	4.6
Default Rec 3	8.1	4.9
Default Rec 4	8.3	5.0
Default Rec 5	6.9	4.2
Default Rec 6	7.8	4.7
Default Rec 7	8.0	4.8
Default Rec 8	8.0	4.8
Default Rec 9	7.1	4.3
Default Rec 10	7.0	4.2

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PROJECT PASSES - NO EXCEEDANCES OF NAAQ CO STANDARDS ARE PREDICTED
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