Memorandum

U.S. Department of Transportation

Federal Highway Administration
Federal Transit Administration

SENT BY ELECTRONIC MAIL

Subject: **INFORMATION:** Clarification of Transportation Conformity Requirements for FHWA/FTA Projects Requiring Environmental Impact Statements

Date: May 20, 2003

From: (Original signed by)
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Reply to Attn. of: HEPN-40/TPL-30

To: FHWA Division Administrators
Federal Lands Highway Division Engineers
FTA Regional Administrators

The purpose of this memorandum is to clarify how full compliance with the Clean Air Act transportation conformity requirements is to be achieved for FHWA and FTA projects requiring environmental impact statements (EIS) under the National Environmental Policy Act (NEPA). The Clean Air Act and the Transportation Conformity Rule (40 CFR 93.104) require that proposed projects must be found to conform to the State Implementation Plan (SIP) before they are adopted, accepted, approved, or funded by FHWA or FTA. However, there has been some confusion about whether conformity of a project must be determined prior to approval of the final EIS or prior to the issuance of the record of decision (ROD).

Federal agencies are required by NEPA to prepare an EIS for major Federal actions that significantly affect the quality of the human environment. The EIS process is carried out in two separate phases which result in the preparation of a draft EIS and a final EIS. An EIS is a disclosure document. It details the process through which a transportation project was developed; the potential impacts resulting from the project; and the demonstrated compliance, to the extent possible, with all applicable environmental laws and related requirements. However, approval of the final EIS does not permit a project sponsor to proceed to further actions (such as final design or construction). For those subsequent actions to proceed, FHWA or FTA must issue

a ROD.

In accordance with 23 CFR 771.133, the final EIS should document compliance with requirements of all applicable environmental laws, Executive Orders, and other related requirements, including the transportation conformity provisions of the Clean Air Act. However, the regulations also recognize that if full compliance is not possible by the time the final EIS is prepared, the final EIS can reflect consultation with the appropriate agencies and provide reasonable assurance that the requirements will be met.

In those instances when the final EIS does not document full compliance with the transportation conformity provisions, it should at a minimum:

- Document all pertinent consultation and information that supports the reasonable assurance that all of the transportation conformity requirements will be met.
- Discuss the procedural steps that remain in order for all of the transportation conformity requirements to be met. This discussion should include any interagency consultation that must still occur and information that must be provided, as well as the opportunities for public review and comment that will take place.
- Document hot-spot analyses (40 CFR 93.116) in nonattainment and maintenance areas for carbon monoxide and particulate matter with diameters of 10 micrometers or less (PM-10), including any required quantitative and qualitative analyses, any mitigation measures that are needed, and the enforceability of any such mitigation measures (40 CFR 93.125).
- Document compliance with any PM-10 control measures in the applicable implementation plan (40 CFR 93.117) in PM-10 nonattainment and maintenance areas that are relevant to construction or operation of the project.

In instances when the final EIS does not document full compliance with the transportation conformity provisions, the conformity determination must be made prior to issuance of a ROD. This is consistent with the transportation conformity rule which refers to NEPA process completion as the point at which FHWA or FTA issues a ROD (40 CFR 93.101).

This guidance was prepared in consultation with EPA. This guidance supersedes any previous guidance, including that which is contained on the issue in the FHWA/FTA January 2, 2002, Revised Guidance for Implementing the March 1999 Circuit Court Decision Affecting Transportation Conformity.

cc: Directors of Field Services

AIR QUALITY HOT-SPOT CO ANALYSIS

TECHNICAL REPORT

I-69, Evansville to Indianapolis

Section 1 – I-64 to SR 64

Gibson, Vanderburgh, and
Warrick Counties, Indiana

Prepared for:

Indiana Department of Transportation

Federal Highway Administration

Prepared by:

815 West Market Street
Louisville, Kentucky 40202

December 2006

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Kirk J. Reinke

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1.0 PROJECT DESCRIPTION

This project is located north of the Evansville area, which is in southwest Indiana along the Ohio River. The study corridor for the proposed road begins at the Blue Bell Road-Warrenton Road overpass of I-164 just south of the present-day I-164/I-64/SR 57 interchange and continues to approximately one mile north of SR 64 near Oakland City, a distance of approximately 13 miles. The beginning of Section 1 is located just north of Vanderburgh County, in Gibson County close to the Warrick County line. The existing dual lane pavement of I-164 will be extended northeastward along present SR 57 for a short distance past Nobles Chapel Road (which is the first road north of I-64). It will then turn (leaving SR 57) to the north to parallel the Gibson-Warrick County line.

The corridor for I-69 Section 1 crosses SR 68 approximately one-half mile west of present day SR 57. This section includes a proposed interchange at SR 68 to provide access to Haubstadt and Lynnville as well as existing SR 57 north and south. The corridor parallels Gibson County Road (CR) 550E to minimize impacts to wetland resources as it crosses Pigeon Creek approximately 2 miles north of SR 68. The crossing was chosen because it is the one location along Pigeon Creek in this area that is not associated with known wetlands.

Heading to the northeast the corridor will cross SR 168 approximately 2.5 miles west of the present day SR 57 at Mackey. An interchange is proposed at SR 168 to provide access to Fort Branch, Mackey, and existing SR 57 north and south. Continuing northeastward, the corridor parallels and runs about 1.5 miles west of SR 57 near Somerville. The corridor passes through the Wabash Lowland physiographic division. Broad terraced valleys and low till-covered hills characterize the Wabash Lowland division, wherein agriculture is the dominant land use (See Figure 1).

For a short distance northwest of Somerville the corridor passes through the Boonville Hills physiographic division, before returning to the Wabash Lowland division. The Boonville Hills division is characterized by bedrock hills of moderate relief. Upon leaving the Boonville Hills division near Gibson CR 450S and CR 890E, the corridor turns in a northern direction to cross SR 64 approximately 1.5 miles west of SR 57 at Oakland City. Section 1's corridor ends approximately 1 mile north of SR 64. A proposed interchange at SR 64 would provide access to Princeton and Oakland City as well as existing SR 57 north and south. The SR 64 interchange is located at the point where Tier 2 Section 1 connects to Section 2. The SR 64 interchange is included as a part of the Tier 2 study for Section 1.

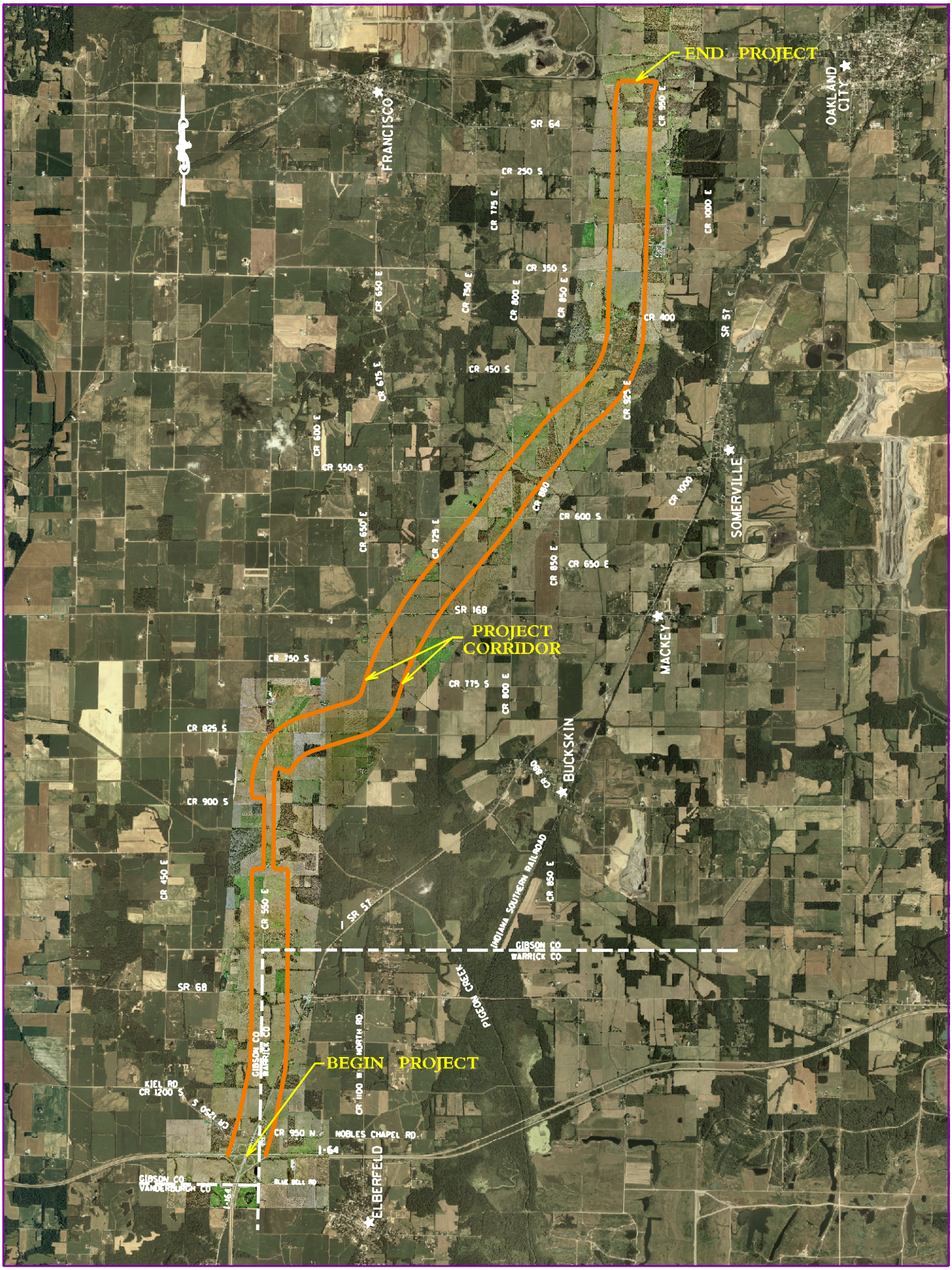

Figure 1 : Project Area

2.0 ALTERNATIVE ALIGNMENTS UNDER CONSIDERATION

A No-Build Alternative and a total of eight build alternatives are being considered for this project. For purposes of reference and analysis, the Section 1 corridor was divided into three segments referred to as South, Central, and North. The South Segment begins I-164 at the Blue Bell Road-Warrenton Road overpass, just south of the I-64 interchange, and goes to an east-west line approximately 900 feet north of Pigeon Creek. This terminus was selected because the corridor narrows to 500 feet at this point, and all alternatives in the South Segment have this point in common. The Central Segment begins at this common point and continues north to an east-west line approximately 3,000 feet south of Gibson County Road (CR) 450S. The North Segment begins at this point and continues to the northern terminus of Section 1 approximately one mile north of SR 64 in Gibson County. Alternatives within one segment may be connected to those in adjoining segments to form alternatives extending the full length of the corridor. The naming convention for the alternatives is as follows:

"1" = Section 1 of the I-69 Tier 2 studies

"S" = South, "C" = Central, "N" = North Segment

1, 2, 3, or 4 = an alternative's identification within its segment

For example, 1-S1 is an alternative in the southernmost segment of Section 1.

2.1 No-Build Alternative

The No-Build Alternative is one in which the FHWA would take no action to construct a new road linking Evansville and Indianapolis. With the No-Build Alternative, no federally funded highway project would be implemented, and traffic from the existing and future developments would use the local roadways, namely SR 57, SR 68, SR 168, and SR 64. Because traffic volumes are expected to increase, additional traffic congestion and an increased potential for crashes are anticipated along these roads. The No-Build Alternative would not meet the stated purposes and needs for the proposed project.

2.2 Build Alternatives

Four preliminary mainline alternatives were developed for the South Segment, three were developed for the Central Segment, and four were developed for the North Segment. The South Segment alternatives traverse portions of Warrick and Gibson Counties, while those in the Central and North Segments are entirely in Gibson County. The following describes the preliminary alternatives.

South Segment—The four preliminary alignments in the South Segment begin at the I-64 interchange and continue in a northbound direction. They cross a tributary to Pigeon Creek and Pigeon Creek and terminate approximately 900 feet north of the creek. Because the Section 1 corridor is only 550 feet wide at the crossing of Pigeon Creek, all of the alternatives have an almost identical alignment at the crossing and terminate on a shared alignment. The alternatives range in length from 3.94 to 3.96 miles. Their locations are shown in Figure 2. The alternatives are as follows:

- Alternative 1-S1 3.94 miles
- Alternative 1-S2 3.94 miles
- Alternative 1-S3 3.95 miles
- Alternative 1-S4 3.96 miles

Alternative **1-S1** is the westernmost alignment in the South Segment. From its southern terminus at the Blue Bell Road-Warrenton Road bridge over I-164, the alternative travels due north and provides an interchange for I-69 with I-64/I-164. North of the interchange, the alternative goes due north parallel to and immediately west of the right-of-way of Gibson CR 550E. CR 550E would be relocated to the immediate west of the Alternative 1-S1 alignment and continue to provide a connection between CR1050S (Tepe Road) and CR 900S just north of the Pigeon Creek. The existing CR 550E roadway would remain open to traffic to a point approximately 3,000 feet north of Gibson CR 1050S and provide access to the residences and farms immediately to the east.

Alternative **1-S2** is very similar to Alternative 1-S1 but goes due north adjacent to the east side of CR 550E. This alternative would allow the entire length of CR 550E to remain open to traffic without relocation of the roadway, but it requires the acquisition of residences fronting on the east side of CR 550E. This alternative also eliminates direct access to the remaining adjacent farmland to the east via CR 550E.

Alternative **1-S3** also goes due north from the Blue Bell Road-Warrenton Road bridge, but is farther east than Alternative 1-S2. It would not require the acquisition of residences fronting on CR 550E; however, it would sever[1] the adjoining farm fields. This alternative is located just west of the Cinergy power transmission lines easement.

1 "Severing" a farm means dividing it into two or more unconnected parcels by the purchase of the right-of-way necessary for the roadway. Severing may separate a portion of the farm from the residence or from the place where equipment is stored and cause inconvenience and additional travel time to work a portion of the farm.

Alternative **1-S4** is the easternmost alternative in the South Segment and is located on the east side on the Cinergy power line easement. This alternative goes due north from the Blue Bell Road-Warrenton Road bridge, and then curves to the northwest to connect to the common point in the 500-foot-wide portion of the corridor where the Central Segment begins. This alternative also would sever the farms east of CR 550 and crosses the power line easement twice.

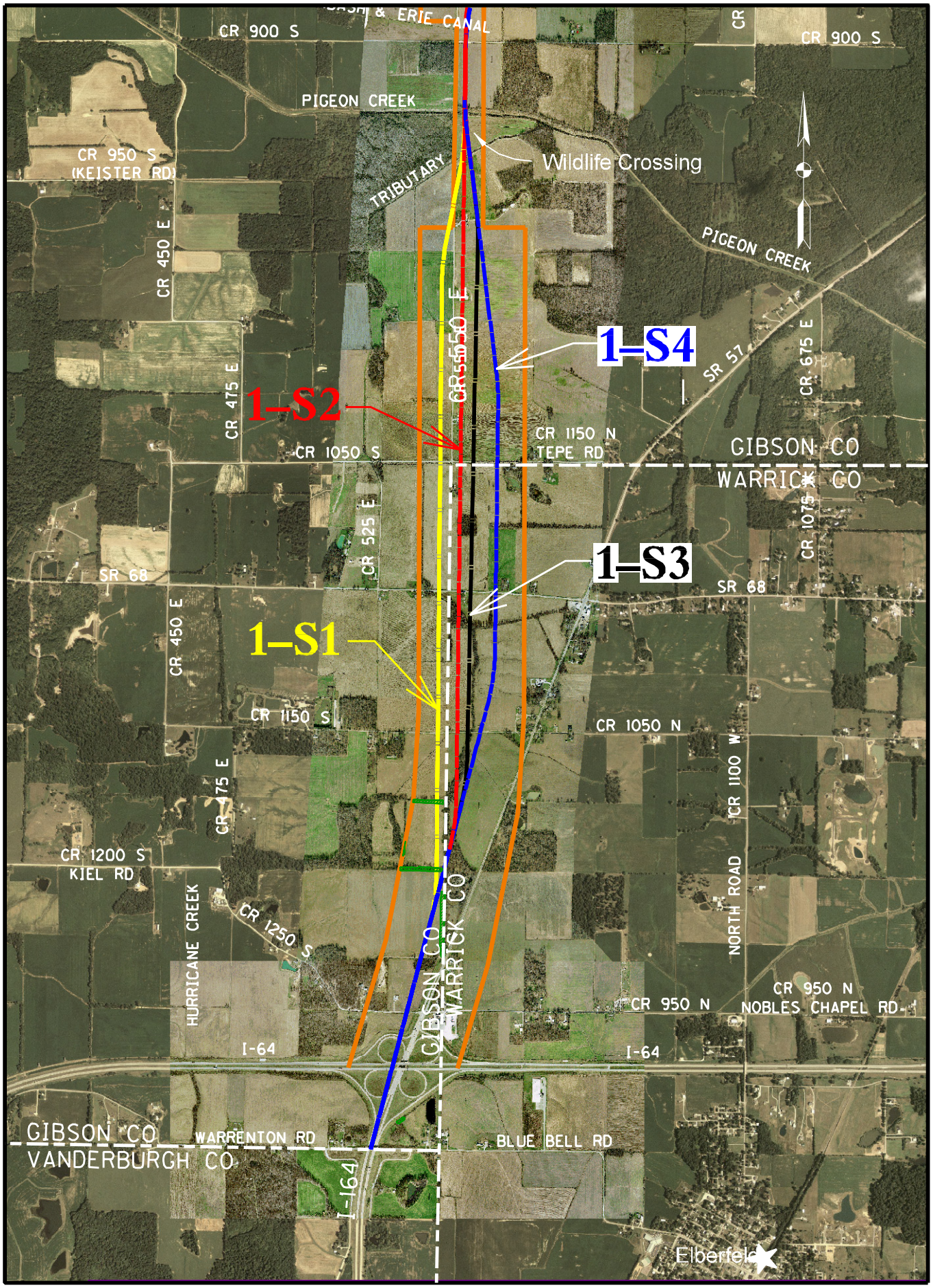

Figure 2 Alignment Alternatives - Southern Segment of Section 1

Central Segment—The three preliminary alternatives in the Central Segment begin at a point approximately 900 feet north of Pigeon Creek where the Tier 1 corridor is only 550 feet wide. The alternatives curve to the northeast and go in a northeasterly direction to a point approximately 3,000 feet south of CR 450S, where the North Segment begins. The alternatives range in length from 5.39 to 5.47 miles. Their locations are shown in Figure 3. The alternatives are as follows:

- Alternative 1-C1 5.47 miles
- Alternative 1-C2 5.39 miles
- Alternative 1-C3 5.46 miles

Alternative **1-C1** initially follows the center of the Tier 1 corridor with a series of reverse curves.[2] It first curves from a northbound direction to the east before curving back to the northeast. It then curves slightly to the east and follows a straight alignment along the western edge of the corridor to the point where it transitions to the North Segment.

Alternative **1-C3** eliminates the repeated curves in Alternative 1-C1. It curves directly to the northeast, follows a straighter alignment than Alternative 1-C1, and stays in the most eastern portion of the Tier 1 corridor.

Alternative **1-C2** is a combination of portions of Alternatives 1-C1 and 1-C3. It also eliminates the reverse curves of Alternative 1-C1 by following the Alternative 1-C3 alignment for the first 2.2 miles. It then diverges from Alternative 1-C3 and heads westward for 1.5 miles to join the Alternative 1-C1 alignment, which it follows for the remainder of the Central Segment.

2 A reverse curve is a succession of curves in which a curved horizontal alignment changes to a curve in the opposite direction of travel. For example, a curve to the right immediately followed by a curve to the left (with no straight section in between) is a reverse curve. A reverse curve may be confusing to drivers, and generally is regarded as an undesirable design feature.

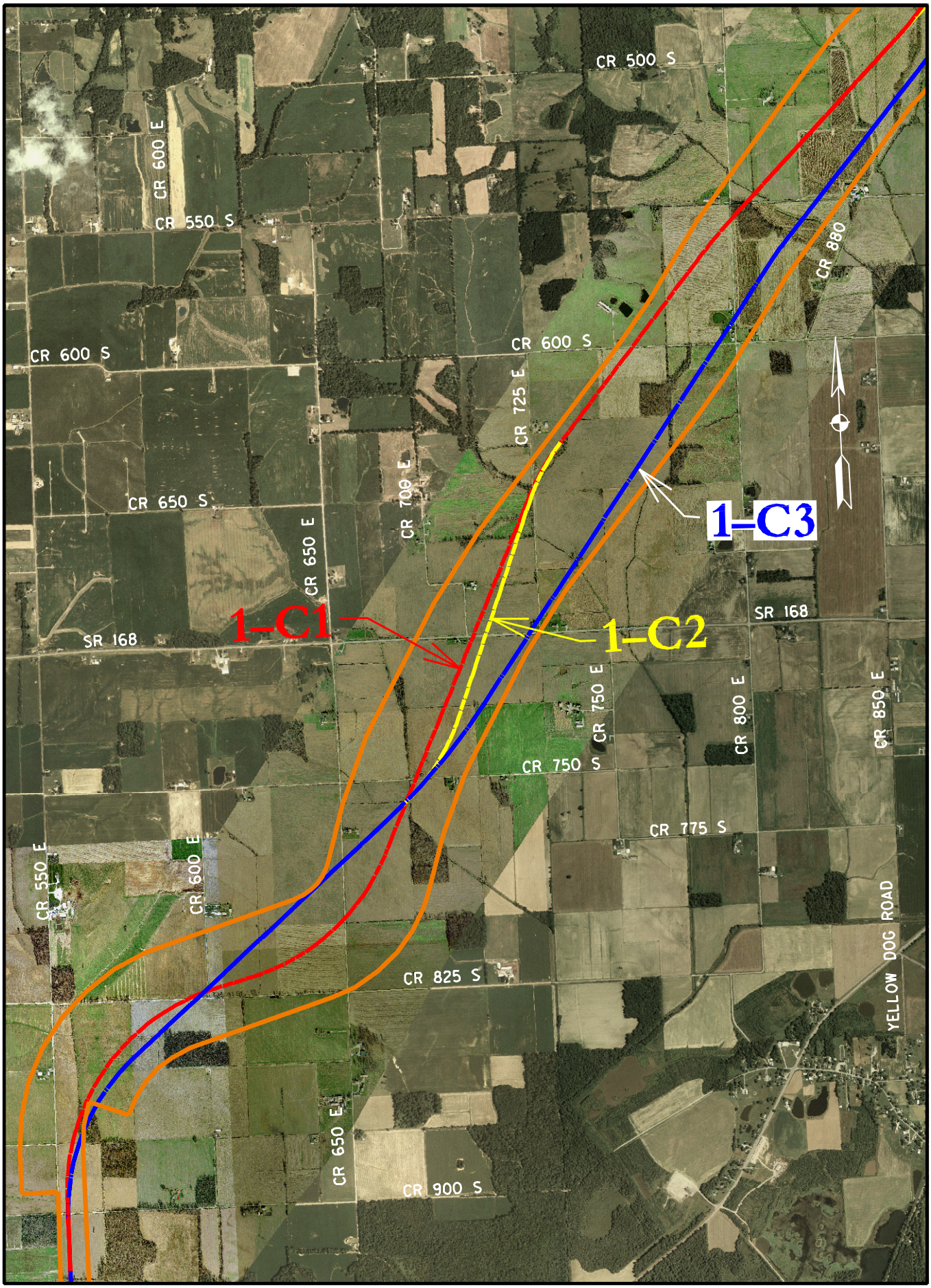

Figure 3: Alignment Alternatives - Central Segment of Section 1

North Segment—Initially, three preliminary alignments were developed in the North Segment, all of which begin at a point approximately 3,000 feet south of CR 450S, curve to the north and head in a northerly direction to a point where Section 2 begins north of the proposed SR 64 interchange. Based on input received from CAC members and from the public, one of the alternatives (1-N1) was modified to produce a fourth alternative in this segment, designated as 1-N1 Modified. The alternatives range in length from 3.61 to 3.69 miles. Their locations are shown in Figure 4. The alternatives are as follows:

- Alternative 1-N1 3.65 miles
- Alternative 1-N1 Modified 3.61 miles
- Alternative 1-N2 3.62 miles
- Alternative 1-N3 3.69 miles

Alternative **1-N1** is the westernmost alignment in the corridor. From the point of transition from the Central Segment it curves in a northwesterly direction to avoid two large wetland areas to the east; however, it would impact two small wetland areas and require the closure of a portion of CR 890E. It then curves due north to run parallel and adjacent to the property lines and the West Fork of Keg Creek in the area, thus avoiding severance of several farm parcels.

Alternative **1-N1 Modified** is the same alignment as Alternative 1-N1, except for the initial 5,800 feet south of CR 400S. The Alternative 1-N1 alignment was modified slightly in this area: the alignment was shifted eastward to leave CR 890E open and permit connection with Alternative 1-C3 rather than Alternative 1-C1 in the Central Segment.

Alternative **1-N2** is located approximately in the center of the corridor. From the point of transition from the Central Segment it curves in a northeasterly direction to avoid CR 890E, two small wetland areas to the west, and a pond to the east. CR 890E would remain open to traffic. The alignment then curves due north and parallels property lines in the area. Since this alignment is not immediately adjacent to the property lines, it would sever several farms.

Alternative **1-N3** is the easternmost alternative in the corridor. It passes east of two wetlands and a pond. From the point of transition from the Central Segment, it curves due north to run parallel and adjacent to some of the property lines in the area to avoid severing farms.

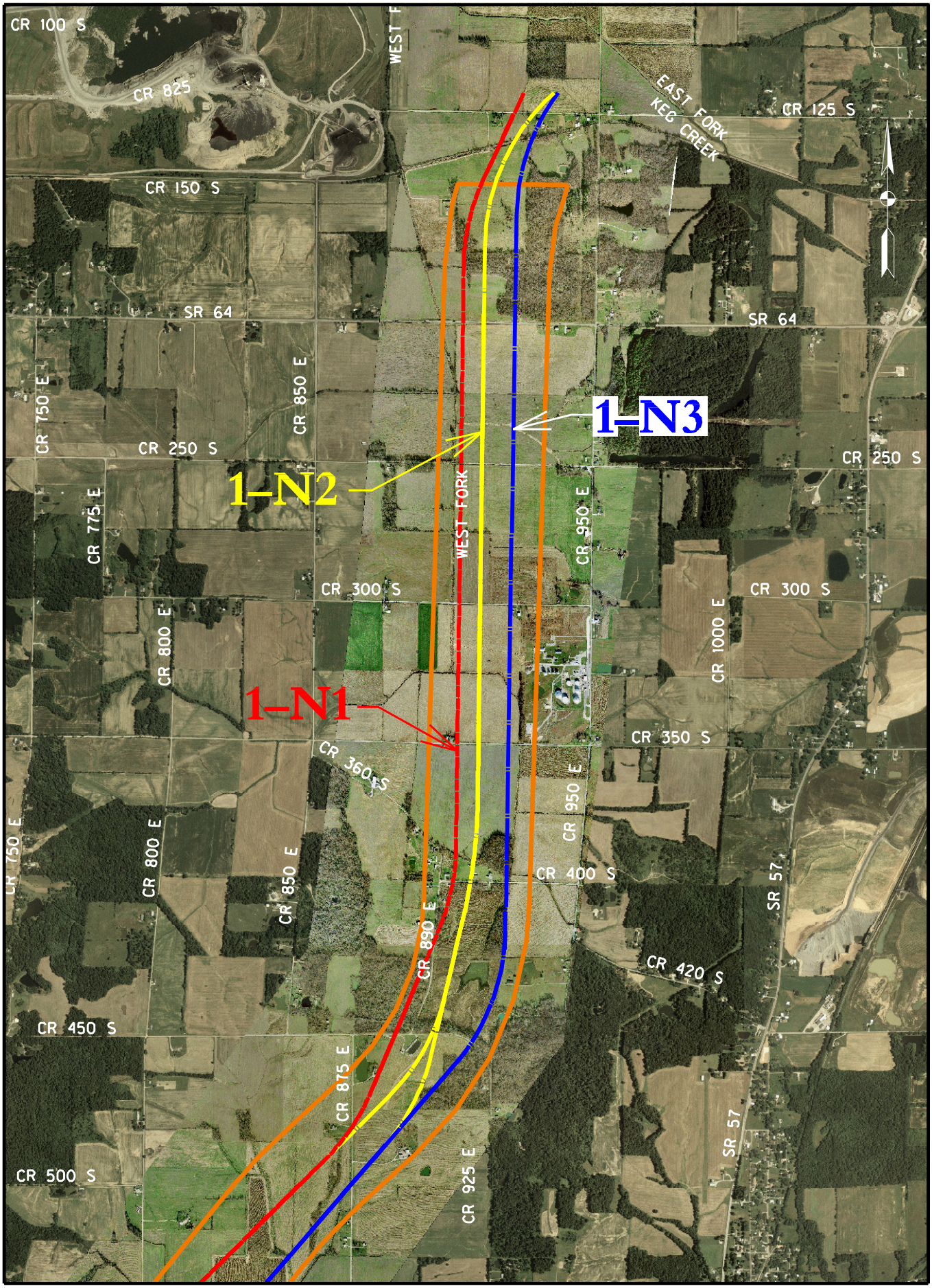

Figure 4: Alignment Alternatives - Northern Segment of Section 1

3.0 METHODOLOGY

3.1 Introduction

The primary source of air pollutants associated with either construction of a new highway or the improvement of an existing highway is from motor vehicle use. The major pollutant emitted by motor vehicles is carbon monoxide (CO), which is formed primarily by the combustion of fuel associated with transportation.

3.2 Analysis Techniques

In general, CO emissions are associated with large volumes of slow-moving traffic, such as exists at highly congested intersections. Areas experiencing high levels of CO are referred to as CO "hot spots" A "hot-spot" analysis for CO is a standard part of the NEPA process for highway projects. A hot-spot analysis is known as a "microscale" analysis because it focuses on a relatively small geographic area.

The purpose of a CO hot-spot analysis is to determine if CO emissions generated by a proposed project would cause or contribute to an exceedance of the air quality standard for CO as promulgated by USEPA. The state and federal ambient air quality standards for CO are:

One hour: 35 ppm or 40 mg/m^3

Eight hour: 9 ppm or 10 mg/m^3

Note: ppm= parts per million
mg/m^3 = milligrams per cubic meter

These concentration values may not be exceeded more than once per year. Any computer-modeled concentration that occurs above either the 1-hour or 8-hour standard is considered a violation. Since CO is a product of combustion, is relatively inert, and is emitted near the ground surface, the highest concentrations are typically found near the source. CO concentrations were evaluated at locations 10 feet, 50 feet, 100 feet, and 150 feet from the edge of the roadway.

For the Tier 2 study, a CO hot-spot analysis comparing existing and future conditions was performed for the interchange carrying the highest traffic volume in the project corridor. This highest-volume interchange was the interchange of I-64, I-164, and SR 57 for the existing and no-build scenarios, and the interchange of I-64, I-164, and the proposed I-69 for the build scenario (which is the same interchange, with I-69 displacing

the connection to SR 57). In addition to the hot-spot analysis, a free-flow analysis of the proposed roadway section carrying the highest volume of traffic was also conducted. The freeflow analysis location was conducted on the leg of I-164 immediately south of the interchange mentioned above.

The dispersion of CO in the Study Area was simulated using CAL3QHC, a microcomputer dispersion model developed to predict the level of CO, or other inert pollutant concentrations, from motor vehicles traveling near roadway intersections. CAL3QHC is the standard model used by USEPA for these types of analyses. The analysis was conducted under simulated meteorological conditions designed to yield "worst-case" CO concentrations. One-hour and 8-hour concentrations were calculated to permit comparison with air quality standards for CO, which are described above.

Graphical representations of the roadways and receptors used in the model are presented in Figure 5 on page 15. The results of the analyses conducted for the Existing Condition, and the No-Build and Build Alternatives are presented in Section 4 and summarized in Table 4 in Appendix A. The forecast year used in this analysis (for the Build and No-Build conditions) was 2030, which is consistent with the forecast year used for other analyses in the Tier 2 study.

Data inputs to the CAL3QHC computer model include: motor vehicle traffic volumes, motor vehicle emission factors, worst-case meteorological conditions, and receptor and roadway site geometry. CO emission factors for Gibson, Vanderburgh, and Warrick Counties were provided by Bernardin, Lochmueller and Associates Inc., as generated by the MOBILE 6.2 computer modeling performed by the metropolitan planning organization (MPO) for the Evansville area. Summaries of traffic volumes and CO emission factors for each link in the existing, No-Build, and Build alternatives, for both the hotspot and freeflow analyses, are provided in Tables 1-3 in Appendix A. The MOBILE 6.2 and CAL3QHC data files are contained in Appendices B and C, respectively.

The air quality analysis was conducted under simulated meteorological conditions designed to yield "worst-case" CO concentrations. These conditions include:

Wind Speed. The wind speed was assumed to be one meter per second (1 m/sec), which represents very little, or no dispersion of the pollutants.

Stability Class. Pasquill's stability class is a measure of atmospheric turbulence, and ranges from “A” (very turbulent) to “F” (very stable). Stability class “D” (neutral) was used to model the free-flow and hotspot portions of the project corridor.

Wind Angle. The wind angle may vary from 0° to 360°, depending on the receptor site locations. The computer model has the flexibility of requiring the program to conduct an incremental worst-case wind angle search. A wind angle search in increments of 10° was used for this analysis.

Surface Roughness. Local terrain characteristics, or surface roughness, can affect the dispersion of pollutants. Surface roughness can range from 1 cm (0.4 inch) for flat, level terrain to 500 cm (16.4 feet) for urban areas (e.g., central business district). A roughness height of 108 cm (3.5 feet) was used for this analysis.

Mixing Height. The mixing height algorithm is intended for the study of nocturnal inversions. It was assigned a value of 1,000 meters (3,280 feet).

Background Concentrations. All CO concentrations emitted by sources other than those being modeled are considered background concentrations. They originate from either nearby parking lots or nearby adjacent intersections. For the purposes of this study, one-hour and eight-hour background concentrations of 2.0 ppm and 1.2 ppm were used.

The CAL3QHC model was used to conduct a microscale analysis of CO concentrations generated along free flow sections of the existing roadway and the proposed project. In addition to meteorological input data, the CAL3QHC computer model requires the roadway and receptor site geometries to be defined within a Cartesian coordinate system. Roadway segments are defined as free-flow links each having a constant width, height, traffic volume, and emission factor. Receptors are located where the maximum total projected pollutant concentration is most likely to occur, as described above.

The air quality impacts analysis associated with the existing alignment, the No-build, and the Build Alternatives were based on average daily traffic (ADT) and design hourly volume (DHV) projections for the year 2030 developed by Bernardin, Lochmueller and Associates Inc.

The CAL3QHC modeling procedure described above was used to predict hourly "worst-case" CO concentrations. One-hour and eight-hour concentrations were calculated to permit comparison with NAAQS. Eight-hour concentrations were determined by subtracting the one-hour background concentration from the total one-hour concentration, then multiplying this value by the persistence factor. A persistence factor of 0.7 was used to account for the variation in traffic and meteorological conditions over an eight-hour period. The eight-hour background concentration was added to arrive at the total eight-hour concentration.

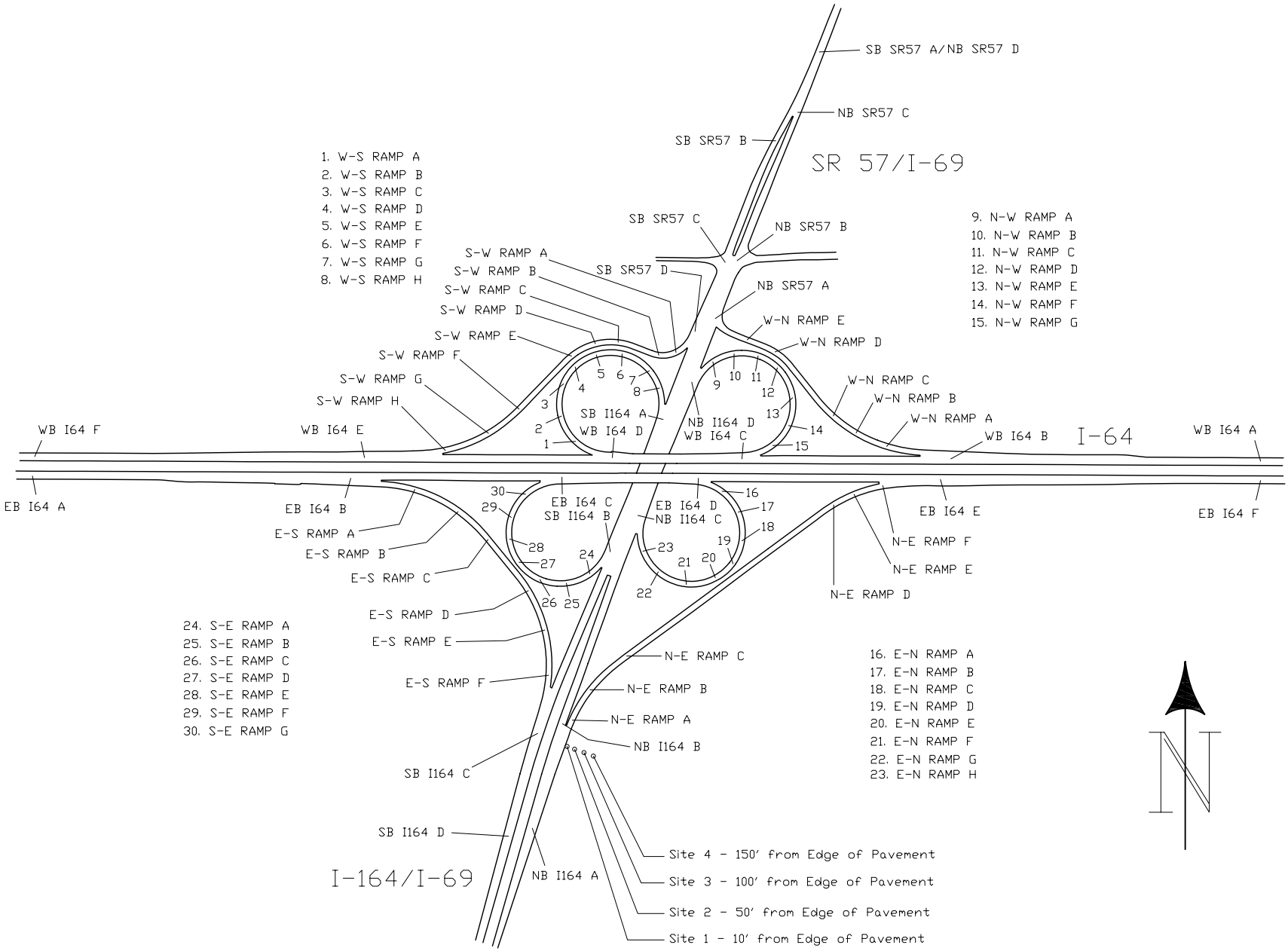

Figure 5: Link/Receptor Map, Hotspot Analysis

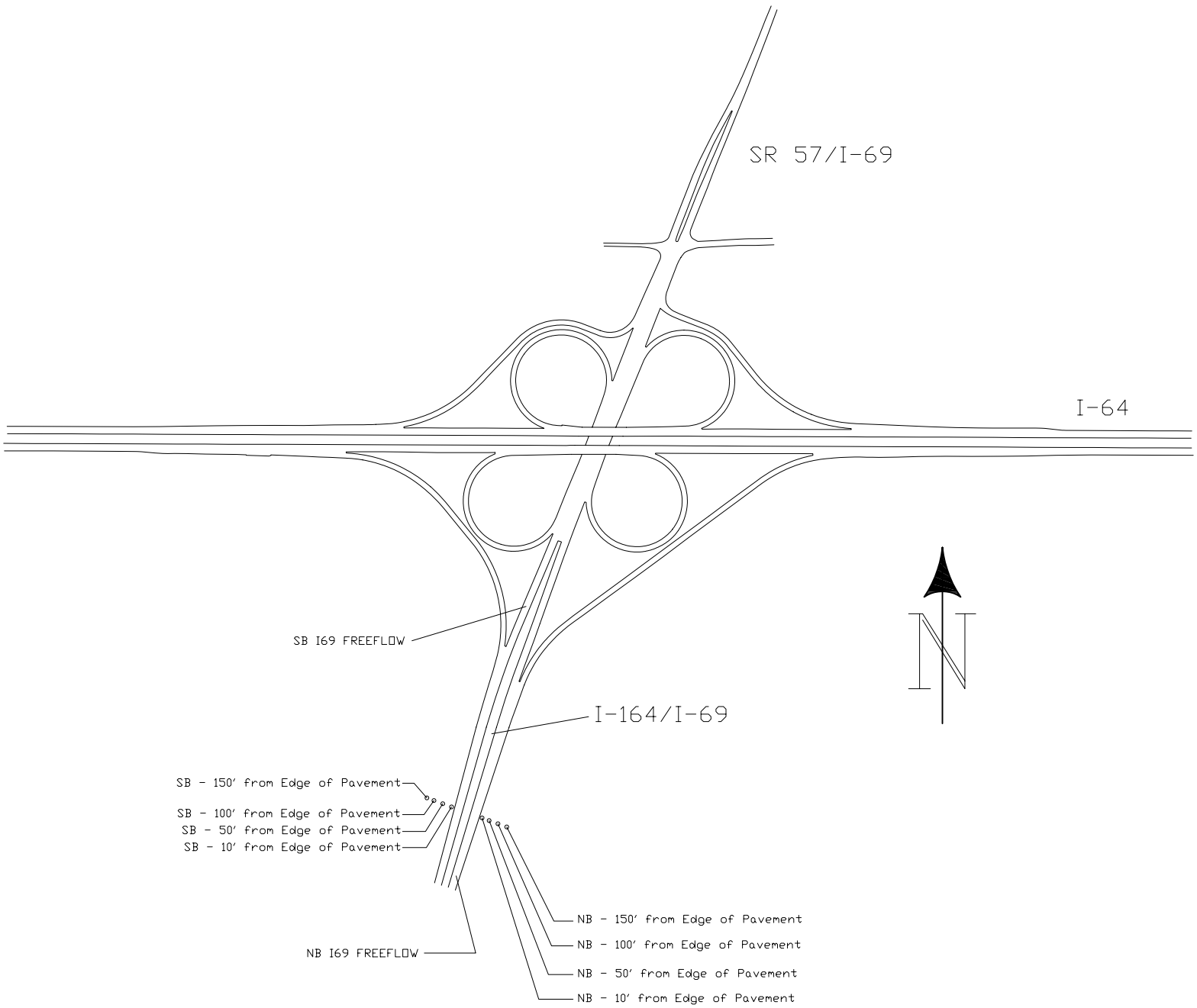

Figure 5 Continued: Link/Receptor Map, Freeflow Analysis

4.0 AIR QUALITY DATA

The results of the analysis conducted for the Existing, No-build Alternative, and Build Alternatives are summarized in Table 4 (*Maximum One-Hour and Eight-Hour CO Concentrations (ppm)*, Appendix A). A brief description of these results is outlined in the following sections.

CO Hot -Spot Analysis

Existing Condition. The results of the Existing Condition analysis indicate that the highest 1-hour concentration of CO is 3.3 ppm, while the highest 8-hour concentration is 2.1 ppm. These concentrations occur at receptor Site 1, located at the mixing zone boundary (10 feet from the edge of pavement).

Future No-Build Condition. The results of the Future No-Build Condition analysis indicate that the highest 1-hour concentration is 2.3 ppm, while the highest 8-hour concentration is 1.4 ppm. These concentrations also occur at receptor Site 1, located at the mixing zone boundary (10 feet from the edge of pavement). When compared to the Existing Condition, the 1-hour and 8-hour CO concentrations for the Future No-Build Condition are predicted to decrease at all four receptor sites.

Build Alternative. The results of the Build Alternative analysis indicate that the highest 1-hour concentration is 2.7 ppm, while the highest 8-hour concentration is 1.7 ppm. These concentrations occur at receptor Site 1, located at the mixing zone boundary (10 feet from the edge of pavement). When compared to the Existing Condition, the 1-hour and 8-hour CO concentrations for the Build Alternative are predicted to decrease at all four receptor sites. When compared to the Future No-Build Condition, the 1-hour and 8-hour CO concentrations for the Build Alternative are predicted to increase at all four receptor sites.

Freeflow Section Analysis

The maximum 1-hour CO concentration for the Build Alternative is 3.4 ppm, while the highest 8-hour concentration is 2.2 ppm. These concentrations all occur at receptor Site 1, located at the mixing zone boundary of the outside northbound lane.

None of the CO values pertaining to this section of I-69, either now or in 2030, exceeds the ambient air quality standards mandated by the US Environmental Protection Agency.

5.0 SUMMARY AND CONCLUSIONS

Pursuant to the 1990 Clean Air Act Amendments, Vanderburgh and Warrick Counties are designated as being in maintenance for the 8-hour ozone standard effective June 30, 2005. According to the calculated existing and future emissions of CO, the proposed highway is not expected to adversely affect the air quality within the Evansville (IN) – Owensboro – Henderson (KY) Interstate Air Quality Control Region. All existing and predicted carbon monoxide concentrations are below the one-hour and eight-hour NAAQS.

In accordance with the Amended Final Conformity Guidelines issued by both the U.S. Department of Transportation and U.S. Environmental Protection Agency, in effect as of September 15, 1997, the project is located in an air quality area that requires transportation control measures. The Evansville MPO included Preferred Alternative 3C in their 2030 Transportation Plan and USDOT found it to conform to the 8-hour Ozone regional conformity requirements. Based on this analysis, the proposed project complies with the Indiana State Implementation Plan for the Attainment and Maintenance of National and State Ambient Air Quality Standards.

REFERENCES

United States Environmental Protection Agency, "User's Guide to CAL3QHC Version 2.0: A Modeling Methodology for Predicting Pollutant Concentrations Near Roadway Intersections." Document #EPA-454/R-92-006 (Revised). Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, September 1995.

United States Environmental Protection Agency, “User’s Guide to MOBILE 6.1 and MOBILE 6.2: Mobile Source Emission Factor Model.” Document #EPA420-R-02-028. Assessment and Standards Division, Office of Transportation and Air Quality, U.S. Environmental Protection Agency, October 2002.

APPENDIX A

TABLES

TABLE 1

EXISTING TRAFFIC DATA

Hotspot Eastbound I-64 Links	Location	VPH	SPEED (mph)	CO Emission Factor (gm/mile)
A-B	I-64 east of NB SR 57 offramp	710	65	23.388
B-C	I-64 from NB SR 57 offramp to NB I-164 onramp	220	65	23.388
C-D	I-64 from NB I-164 onramp to SB I-164 offramp	280	65	23.388
D-E	I-64 from SB I-164 offramp to SB SR 57 onramp	230	65	23.388
E-F	I-64 west of SB SR 57 onramp	660	65	23.388

Hotspot Westbound I-64 Links	Location	VPH	SPEED (mph)	CO Emission Factor (gm/mile)
A-B	I-64 west of SB I-164 offramp	620	65	23.388
B-C	I-64 from SB I-164 offramp to SB SR 57 onramp	560	65	23.388
C-D	I-64 from SB SR 57 onramp to NB SR 57 offramp	880	65	23.388
D-E	I-64 from NB SR 57 offramp to NB I-164 onramp	520	65	23.388
E-F	I-64 east of NB I-164 onramp	580	65	23.388

Hotspot Southbound SR 57 Links	Location	VPH	SPEED (mph)	CO Emission Factor (gm/mile)
A-B, B-C	North of CR 1200S	560	55	20.071
C-D	CR 1200S to WB I-64 offramp	530	55	20.071
D-SB I164 A	WB I-64 offramp to WB I-64 onramp	470	55	20.071

Hotspot Northbound SR 57 Links	Location	VPH	SPEED (mph)	CO Emission Factor (gm/mile)
A-B	EB I-64 offramp to CR 1200S	590	55	20.071
B-C, C-D	North of CR 1200S	570	55	20.071

Hotspot Southbound I-164 Links	Location	VPH	SPEED (mph)	CO Emission Factor (gm/mile)
A-B	WB I-64 onramp to EB I-64 offramp	830	55	23.388
B-C	EB I-64 offramp to EB I-64 onramp	770	55	23.388
C-D	South of EB I-64 onramp	1,260	65	23.388

Hotspot Northbound I-164 Links	Location	VPH	SPEED (mph)	CO Emission Factor (gm/mile)
A-B, B-C	EB I-64 offramp to EB I-64 onramp	800	65	23.388
C-D	EB I-64 onramp to WB I-64 offramp	850	65	23.388
D-NB SR57 A	WB I-64 offramp to EB I-64 onramp	530	55	23.388

Hotspot Ramp - NB I-164 to WB I-64 Links	Location	VPH	SPEED (mph)	CO Emission Factor (gm/mile)
NB I164 D-N-W Ramp A, A-B, B-C, C-D, D-E, E-F, F-G, G-WB I64 C	NB I-164 to WB I-64	320	35	27.954

Hotspot Ramp - SB I-164 to EB I-64 Links	Location	VPH	SPEED (mph)	CO Emission Factor (gm/mile)
SB I164 B-S-E Ramp A, A-B, B-C, C-D, D-E, E-F, F-G, G-EB I64 C	SB I-164 to EB I-64	60	35	27.954

Hotspot Ramp - WB I-64 to SB I-164 Links	Location	VPH	SPEED (mph)	CO Emission Factor (gm/mile)
WB I64 D-W-S Ramp A, A-B, B-C, C-D, D-E, E-F, F-G, G-H, H-SB I164 A	WB I-64 to SB I-164	360	35	27.954

Hotspot Ramp - EB I-64 to NB I-164 Links	Location	VPH	SPEED (mph)	CO Emission Factor (gm/mile)
EB I64 D-E-N Ramp A, A-B, B-C, C-D, D-E, E-F, F-G, G-H, H-NB I164 C	EB I-64 to NB I-164	50	35	27.954

Hotspot Ramp - NB I-164 to EB I-64 Links	Location	VPH	SPEED (mph)	CO Emission Factor (gm/mile)
NB I164 A-N-E Ramp A, A-B, B-C, C-D, D-E, E-F, F-EB I64 E	NB I-164 to EB I-64	430	35	27.954

Hotspot Ramp - SB SR57 to WB I-64 Links	Location	VPH	SPEED (mph)	CO Emission Factor (gm/mile)
SB SR 57 D-S-W Ramp A, A-B, B-C, C-D, D-E, E-F, F-G, G-H, H-WB I64 E	SB SR57 to WB I-64	60	35	27.954

Hotspot Ramp - WB I-64 to NB SR 57 Links	Location	VPH	SPEED (mph)	CO Emission Factor (gm/mile)
WB I64 B-W-N Ramp A, A-B, B-C, C-D, D-E, E-NB SR57 A	WB I-64 to NB SR 57	60	35	27.954

Hotspot Ramp - EB I-64 to SB I-164 Links	Location	VPH	SPEED (mph)	CO Emission Factor (gm/mile)
EB I64 B-E-S Ramp A, A-B, B-C, C-D, D-E, E-F, F-SB I164 C	EB I-64 to SB I-164	60	35	27.954

TABLE 2

NO-BUILD TRAFFIC DATA

Hotspot Eastbound I-64 Links	Location	VPH	SPEED (mph)	CO Emission Factor (gm/mile)
A-B	I-64 east of NB SR 57 offramp	911	65	5.98
B-C	I-64 from NB SR 57 offramp to NB I-164 onramp	644	65	5.98
C-D	I-64 from NB I-164 onramp to SB I-164 offramp	651	65	5.98
D-E	I-64 from SB I-164 offramp to SB SR 57 onramp	532	65	5.98
E-F	I-64 west of SB SR 57 onramp	948	65	5.98

Hotspot Westbound I-64 Links	Location	VPH	SPEED (mph)	CO Emission Factor (gm/mile)
A-B	I-64 west of SB I-164 offramp	835	65	5.98
B-C	I-64 from SB I-164 offramp to SB SR 57 onramp	824	65	5.98
C-D	I-64 from SB SR 57 onramp to NB SR 57 offramp	1,071	65	5.98
D-E	I-64 from NB SR 57 offramp to NB I-164 onramp	721	65	5.98
E-F	I-64 east of NB I-164 onramp	823	65	5.98

Hotspot Southbound SR 57 Links	Location	VPH	SPEED (mph)	CO Emission Factor (gm/mile)
A-B, B-C	North of CR 1200S	337	55	5.875
C-D	CR 1200S to WB I-64 offramp	409	55	5.875
D-SB I164 A	WB I-64 offramp to WB I-64 onramp	307	55	5.875

Hotspot Northbound SR 57 Links	Location	VPH	SPEED (mph)	CO Emission Factor (gm/mile)
A-B	EB I-64 offramp to CR 1200S	563	55	5.875
B-C, C-D	North of CR 1200S	501	55	5.875

Hotspot Southbound I-164 Links	Location	VPH	SPEED (mph)	CO Emission Factor (gm/mile)
A-B	WB I-64 onramp to EB I-64 offramp	656	55	5.98
B-C	EB I-64 offramp to EB I-64 onramp	649	55	5.98
C-D	South of EB I-64 onramp	916	65	5.98

Hotspot Northbound I-164 Links	Location	VPH	SPEED (mph)	CO Emission Factor (gm/mile)
A-B, B-C	EB I-64 offramp to EB I-64 onramp	679	65	5.98
C-D	EB I-64 onramp to WB I-64 offramp	799	65	5.98
D-NB SR57 A	WB I-64 offramp to EB I-64 onramp	522	55	5.98

Hotspot Ramp - NB I-164 to WB I-64 Links	Location	VPH	SPEED (mph)	CO Emission Factor (gm/mile)
NB I164 D-N-W Ramp A, A-B, B-C, C-D, D-E, E-F, F-G, G-WB I64 C	NB I-164 to WB I-64	247	35	5.98

Hotspot Ramp - SB I-164 to EB I-64 Links	Location	VPH	SPEED (mph)	CO Emission Factor (gm/mile)
SB I164 B-S-E Ramp A, A-B, B-C, C-D, D-E, E-F, F-G, G-EB I64 C	SB I-164 to EB I-64	7	35	5.98

Hotspot Ramp - WB I-64 to SB I-164 Links	Location	VPH	SPEED (mph)	CO Emission Factor (gm/mile)
WB I64 D-W-S Ramp A, A-B, B-C, C-D, D-E, E-F, F-G, G-H, H-SB I164 A	WB I-64 to SB I-164	349	35	5.98

Hotspot Ramp - EB I-64 to NB I-164 Links	Location	VPH	SPEED (mph)	CO Emission Factor (gm/mile)
EB I64 D-E-N Ramp A, A-B, B-C, C-D, D-E, E-F, F-G, G-H, H-NB I164 C	EB I-64 to NB I-164	120	35	5.98

Hotspot Ramp - NB I-164 to EB I-64 Links	Location	VPH	SPEED (mph)	CO Emission Factor (gm/mile)
NB I164 A-N-E Ramp A, A-B, B-C, C-D, D-E, E-F, F-EB I64 E	NB I-164 to EB I-64	417	35	5.98

Hotspot Ramp - SB SR57 to WB I-64 Links	Location	VPH	SPEED (mph)	CO Emission Factor (gm/mile)
SB SR 57 D-S-W Ramp A, A-B, B-C, C-D, D-E, E-F, F-G, G-H, H-WB I64 E	SB SR57 to WB I-64	102	35	5.98

Hotspot Ramp - WB I-64 to NB SR 57 Links	Location	VPH	SPEED (mph)	CO Emission Factor (gm/mile)
WB I64 B-W-N Ramp A, A-B, B-C, C-D, D-E, E-NB SR57 A	WB I-64 to NB SR 57	10	35	5.98

Hotspot Ramp - EB I-64 to SB I-164 Links	Location	VPH	SPEED (mph)	CO Emission Factor (gm/mile)
EB I64 B-E-S Ramp A, A-B, B-C, C-D, D-E, E-F, F-SB I164 C	EB I-64 to SB I-164	267	35	5.98

TABLE 3

BUILD ALTERNATIVE TRAFFIC DATA

Hotspot Eastbound I-64 Links	Location	VPH	SPEED (mph)	CO Emission Factor (gm/mile)
A-B	I-64 east of NB I-69 offramp	970	65	5.98
B-C	I-64 from NB SR I-69 offramp to NB I-69 onramp	690	65	5.98
C-D	I-64 from NB I-69 onramp to SB I-69 offramp	820	65	5.98
D-E	I-64 from SB I-69 offramp to SB I-69 onramp	700	65	5.98
E-F	I-64 west of SB I-69 onramp	1,010	65	5.98

Hotspot Westbound I-64 Links	Location	VPH	SPEED (mph)	CO Emission Factor (gm/mile)
A-B	I-64 west of SB I-69 offramp	850	65	5.98
B-C	I-64 from SB I-69 offramp to SB I-69 onramp	780	65	5.98
C-D	I-64 from SB I-69 onramp to NB I-69 offramp	960	65	5.98
D-E	I-64 from NB I-69 offramp to NB I-69 onramp	720	65	5.98
E-F	I-64 east of NB I-69 onramp	800	65	5.98

Hotspot Southbound I-69 North of I-64 Links	Location	VPH	SPEED (mph)	CO Emission Factor (gm/mile)
A-B, B-C, C-D	North of CR 1200S to WB I-64 offramp	2,080	55	5.98
D-SB I164 A	WB I-64 offramp to WB I-64 onramp	1,960	55	5.98

Hotspot Northbound I-69 North of I-64 Links	Location	VPH	SPEED (mph)	CO Emission Factor (gm/mile)
A-B, B-C, C-D	EB I-64 offramp to North of CR 1200S	2,500	55	5.98

Hotspot Southbound I-69 South of I-64 Links	Location	VPH	SPEED (mph)	CO Emission Factor (gm/mile)
A-B	WB I-64 onramp to EB I-64 offramp	2,200	55	5.98
B-C	EB I-64 offramp to EB I-64 onramp	2,070	55	5.98
C-D	South of EB I-64 onramp	2,350	65	5.98

Hotspot Northbound I-69 South of I-64 Links	Location	VPH	SPEED (mph)	CO Emission Factor (gm/mile)
A-B, B-C	EB I-64 offramp to EB I-64 onramp	2,490	65	5.98
C-D	EB I-64 onramp to WB I-64 offramp	2,610	65	5.98
D-NB SR57 A	WB I-64 offramp to EB I-64 onramp	2,430	55	5.98

Freeflow I-164/I-69 Links	Location	VPH	SPEED (mph)	CO Emission Factor (gm/mile)
SB I-69 Freeflow	South of I-64	1,752	65	5.98
NB I-69 Freeflow		2,009	65	5.98

Hotspot Ramp - NB I-69 to WB I-64 Links	Location	VPH	SPEED (mph)	CO Emission Factor (gm/mile)
NB I164 D-N-W Ramp A, A-B, B-C, C-D, D-E, E-F, F-G, G-WB I64 C	NB I-69 to WB I-64	180	35	5.98

Hotspot Ramp - SB I-69 to EB I-64 Links	Location	VPH	SPEED (mph)	CO Emission Factor (gm/mile)
SB I164 B-S-E Ramp A, A-B, B-C, C-D, D-E, E-F, F-G, G-EB I64 C	SB I-69 to EB I-64	130	35	5.98

Hotspot Ramp - WB I-64 to SB I-69 Links	Location	VPH	SPEED (mph)	CO Emission Factor (gm/mile)
WB I64 D-W-S Ramp A, A-B, B-C, C-D, D-E, E-F, F-G, G-H, H-SB I164 A	WB I-64 to SB I-69	240	35	5.98

Hotspot Ramp - EB I-64 to NB I-69 Links	Location	VPH	SPEED (mph)	CO Emission Factor (gm/mile)
EB I64 D-E-N Ramp A, A-B, B-C, C-D, D-E, E-F, F-G, G-H, H-NB I164 C	EB I-64 to NB I-69	120	35	5.98

Hotspot Ramp - NB I-69 to EB I-64 Links	Location	VPH	SPEED (mph)	CO Emission Factor (gm/mile)
NB I164 A-N-E Ramp A, A-B, B-C, C-D, D-E, E-F, F-EB I64 E	NB I-69 to EB I-64	310	35	5.98

Hotspot Ramp - SB I-69 to WB I-64 Links	Location	VPH	SPEED (mph)	CO Emission Factor (gm/mile)
SB SR 57 D-S-W Ramp A, A-B, B-C, C-D, D-E, E-F, F-G, G-H, H-WB I64 E	SB I-69 to WB I-64	120	35	5.98

Hotspot Ramp - WB I-64 to NB I-69 Links	Location	VPH	SPEED (mph)	CO Emission Factor (gm/mile)
WB I64 B-W-N Ramp A, A-B, B-C, C-D, D-E, E-NB SR57 A	WB I-64 to NB I-69	70	35	5.98

Hotspot Ramp - EB I-64 to SB I-69 Links	Location	VPH	SPEED (mph)	CO Emission Factor (gm/mile)
EB I64 B-E-S Ramp A, A-B, B-C, C-D, D-E, E-F, F-SB I164 C	EB I-64 to SB I-69	280	35	5.98

TABLE 4

MAXIMUM ONE-HOUR AND EIGHT-HOUR CO CONCENTRATIONS (PPM)

Hot Spot Analysis	Existing Network 2000		No-Build Alternative 2030		Build Alternative 2030	
Receptor Site	1 Hr.	8 Hr.	1 Hr.	8 Hr.	1 Hr.	8 Hr.
Site 1 -- 10' from Edge of Pavement	3.3	2.1	2.3	1.4	2.7	1.7
Site 2 -- 50' from Edge of Pavement	2.9	1.8	2.1	1.3	2.4	1.5
Site 3 -- 100' from Edge of Pavement	2.7	1.7	2.1	1.3	2.3	1.4
Site 4 -- 150' from Edge of Pavement	2.6	1.6	2.0	1.2	2.3	1.4
Max. Value (ppm) 1 Hr.	3.3		2.3		2.7	
Max. Value (ppm) 8 Hr.	2.1		1.4		1.7	

Free-Flow Analysis	Build Alternative 2030	
Receptor Site	1 Hr.	8 Hr.
Site 1 -- Northbound -- 10' from Edge of Pavement	3.4	2.2
Site 2 -- Northbound -- 50' from Edge of Pavement	2.6	1.6
Site 3 -- Northbound -- 100' from Edge of Pavement	2.5	1.6
Site 4 -- Northbound -- 150' from Edge of Pavement	2.3	1.4
Site 5 -- Southbound -- 10' from Edge of Pavement	3.2	2.0
Site 6 -- Southbound -- 50' from Edge of Pavement	2.6	1.6
Site 7 -- Southbound -- 100' from Edge of Pavement	2.5	1.6
Site 8 -- Southbound -- 150' from Edge of Pavement	2.4	1.5
Max. Value (ppm) 1 Hr.	3.4	
Max. Value (ppm) 8 Hr.	2.2	

National Ambient Air Quality Standards:
1-Hour: 35.0 ppm
8-Hour: 9.0 ppm

Background CO Concentrations:
Urban: 1-hour, 4.0 ppm; 8-hour, 2.5 ppm
Rural: 1-hour, 2.0 ppm; 8-hour, 1.2 ppm

APPENDIX B

CO EMISSION FACTORS

Gibson County 2002
CO Emission Rates (g/mi)

Functional Class	Vehicle Class									
	LDGV	LDGT12 < 6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
Rural Freeway/Freeway Ramp	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Rural OPA	21.140	23.990	28.790	25.210	17.990	1.599	1.413	2.368	9.220	20.071
Rural Minor Arterial	20.340	23.190	28.010	24.410	17.540	1.597	1.412	2.363	9.400	20.341
Rural Major Collector	18.760	21.590	26.440	22.820	18.480	1.652	1.461	2.568	10.530	19.405
Rural Minor Collector	18.020	20.820	25.710	22.070	19.570	1.724	1.527	2.841	11.660	18.192
Rural Local	17.850	20.590	25.560	21.850	22.880	1.837	1.629	3.268	13.220	18.662
Urban Interstate	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Urban Freeway/Expressway	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Urban OPA	19.230	22.060	26.910	23.300	17.430	1.625	1.437	2.469	10.070	19.925
Urban Minor Arterial	18.710	21.530	26.390	22.770	18.600	1.656	1.465	2.582	10.590	19.664
Urban Collector	18.020	20.820	25.710	22.070	19.590	1.724	1.526	2.840	11.660	19.244
Urban Local	16.130	19.970	25.210	21.300	63.270	2.928	2.611	7.405	26.430	18.706

Note: Per advice from Bernardin, Lochmueller and Associates Inc., Freeway emissions for all vehicles = 23.388 g/mi, and Ramp emissions for all vehicles = 27.954 g/mi

Gibson County 2030
CO Emission Rates (g/mi)

Functional Class	Vehicle Class									
	LDGV	LDGT12 < 6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
Rural Freeway/Freeway Ramp	7.340	7.870	8.220	7.960	7.810	0.566	0.298	0.215	23.180	5.980
Rural OPA	6.520	7.010	7.340	7.090	5.200	0.497	0.257	0.169	9.220	5.875
Rural Minor Arterial	6.310	6.790	7.110	6.870	5.040	0.497	0.257	0.170	9.410	5.990
Rural Major Collector	5.850	6.310	6.610	6.390	5.220	0.519	0.270	0.186	10.550	5.728
Rural Minor Collector	5.660	6.100	6.390	6.180	5.650	0.548	0.287	0.204	11.660	5.501
Rural Local	5.670	6.110	6.390	6.180	6.470	0.594	0.315	0.236	13.260	5.570
Urban Interstate	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Urban Freeway/Expressway	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Urban OPA	5.910	6.380	6.680	6.450	5.120	0.513	0.267	0.180	10.300	5.816
Urban Minor Arterial	5.820	6.280	6.580	6.350	5.270	0.523	0.272	0.188	10.680	5.796
Urban Collector	5.660	6.100	6.390	6.180	5.650	0.548	0.287	0.204	11.660	5.727
Urban Local	6.310	6.710	7.000	6.780	15.090	1.030	0.572	0.555	26.430	6.496

APPENDIX C

CAL3QHC INPUT AND OUTPUT FILES

2000 EXISTING

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'I-69 SECTION 1'  60.0  108.0  0.0  0.0  4  1  0  0  'PPM'
'EXIST. HOTSPOT - 10'  458722.7  4224320.5  1.8
'EXIST. HOTSPOT - 50'  458734.3  4224316.6  1.8
'EXIST. HOTSPOT - 100'  458748.7  4224312.0  1.8
'EXIST. HOTSPOT - 150'  458763.3  4224307.3  1.8
'EXISTING HOTSPOT'  87  1  0  'C'
1  1
'EB I64 A-B'  'AG'  457880.6  4224727.1  458344.6  4224725.6  710  23.388  0.0  13.41
1  1
'EB I64 B-C'  'AG'  458344.6  4224725.6  458747.0  4224723.8  220  23.388  0.0  13.41
1  1
'EB I64 C-D'  'BR'  458747.0  4224723.8  458899.8  4224723.3  280  23.388  6.1  13.41
1  1
'EB I64 D-E'  'AG'  458899.8  4224723.3  459336.3  4224721.7  230  23.388  0.0  13.41
1  1
'EB I64 E-F'  'AG'  459336.3  4224721.7  459811.3  4224720.5  660  23.388  0.0  13.41
1  1
'WB I64 A-B'  'AG'  459807.0  4224747.7  459357.4  4224751.3  620  23.388  0.0  13.41
1  1
'WB I64 B-C'  'AG'  459357.4  4224751.3  458966.2  4224751.4  560  23.388  0.0  13.41
1  1
'WB I64 C-D'  'BR'  458966.2  4224751.4  458793.0  4224751.4  880  23.388  6.1  13.41
1  1
'WB I64 D-E'  'AG'  458793.0  4224751.4  458363.0  4224753.3  520  23.388  0.0  13.41
1  1
'WB I64 E-F'  'AG'  458363.0  4224753.3  457883.0  4224755.2  580  23.388  0.0  13.41
1  1
'SB SR57 A-B'  'AG'  459102.0  4225366.1  459006.8  4225173.9  560  20.071  0.0  13.41
1  1
'SB SR57 B-C'  'AG'  459006.8  4225173.9  458960.5  4225053.3  560  20.071  0.0  13.41
1  1
'SB SR57 C-D'  'AG'  458960.5  4225053.3  458919.2  4224944.4  530  20.071  0.0  13.41
1  1
'SB SR57 D-SB I164 A'  'AG'  458919.2  4224944.4  458863.5  4224798.1  470  20.071  0.0  13.41
1  1
'SB I164 A-B'  'AG'  458863.5  4224798.1  458792.8  4224619.0  830  23.388  0.0  13.41
1  1
'SB I164 B-C'  'AG'  458792.8  4224619.0  458678.3  4224342.9  770  23.388  0.0  13.41
1  1
'SB I164 C-D'  'AG'  458678.3  4224342.9  458648.6  4224244.1  1260  23.388  0.0  13.41
1  1
'NB I164 A-B'  'AG'  458687.8  4224258.1  458719.3  4224370.9  800  23.388  0.0  13.41
1  1
'NB I164 B-C'  'AG'  458719.3  4224370.9  458831.1  4224673.2  800  23.388  0.0  13.41
1  1
'NB I164 C-D'  'AG'  458831.1  4224673.2  458903.7  4224860.2  850  23.388  0.0  13.41
1  1
'NB I164 D-NB SR57 A'  'AG'  458903.7  4224860.2  458942.1  4224960.0  530  23.388  0.0  13.41
1  1
'NB SR57 A-B'  'AG'  458942.1  4224960.0  458978.3  4225054.0  590  20.071  0.0  13.41
1  1
'NB SR57 B-C'  'AG'  458978.3  4225054.0  459069.7  4225277.0  570  20.071  0.0  13.41
1  1
'NB SR57 C-D'  'AG'  459069.7  4225277.0  459102.0  4225366.1  570  20.071  0.0  13.41
1  1
'SR57 A - N-W RAMP A'  'AG'  458903.7  4224860.2  458939.4  4224898.4  320  27.954  0.0  9.75
1  1
'N-W RAMP A-B'  'AG'  458939.4  4224898.4  458980.5  4224914.9  320  27.954  0.0  9.75
1  1
'N-W RAMP B-C'  'AG'  458980.5  4224914.9  459023.5  4224905.4  320  27.954  0.0  9.75
1  1
'N-W RAMP C-D'  'AG'  459023.5  4224905.4  459053.8  4224877.0  320  27.954  0.0  9.75
1  1
'N-W RAMP D-E'  'AG'  459053.8  4224877.0  459065.8  4224836.5  320  27.954  0.0  9.75
1  1
'N-W RAMP E-F'  'AG'  459065.8  4224836.5  459057.6  4224797.9  320  27.954  0.0  9.75
1  1
'N-W RAMP F-G'  'AG'  459057.6  4224797.9  459027.8  4224767.6  320  27.954  0.0  9.75
1  1
'N-W RAMP G-WB I64 C'  'AG'  459027.8  4224767.6  458966.2  4224751.4  320  27.954  0.0  9.75
1  1
'SB I164 B-S-E RAMP A'  'AG'  458792.8  4224619.0  458754.8  4224575.3  60  27.954  0.0  9.75
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1  1
'S-E RAMP A-B'  'AG'  458754.8  4224575.3  458711.8  4224560.2  60  27.954  0.0  9.75
1  1
'S-E RAMP B-C'  'AG'  458711.8  4224560.2  458666.9  4224572.2  60  27.954  0.0  9.75
1  1
'S-E RAMP C-D'  'AG'  458666.9  4224572.2  458636.6  4224606.4  60  27.954  0.0  9.75
1  1
'S-E RAMP D-E'  'AG'  458636.6  4224606.4  458630.9  4224647.4  60  27.954  0.0  9.75
1  1
'S-E RAMP E-F'  'AG'  458630.9  4224647.4  458644.1  4224686.6  60  27.954  0.0  9.75
1  1
'S-E RAMP F-G'  'AG'  458644.1  4224686.6  458677.7  4224713.2  60  27.954  0.0  9.75
1  1
'S-E RAMP G-EB 164 C'  'AG'  458677.7  4224713.2  458747.0  4224723.8  60  27.954  0.0  9.75
1  1
'WB I64 D-W-S RAMP A'  'AG'  458793.0  4224751.4  458734.6  4224774.5  360  27.954  0.0  9.75
1  1
'W-S RAMP A-B'  'AG'  458734.6  4224774.5  458708.6  4224815.6  360  27.954  0.0  9.75
1  1
'W-S RAMP B-C'  'AG'  458708.6  4224815.6  458709.9  4224860.5  360  27.954  0.0  9.75
1  1
'W-S RAMP C-D'  'AG'  458709.9  4224860.5  458734.6  4224896.5  360  27.954  0.0  9.75
1  1
'W-S RAMP D-E'  'AG'  458734.6  4224896.5  458771.2  4224913.6  360  27.954  0.0  9.75
1  1
'W-S RAMP E-F'  'AG'  458771.2  4224913.6  458814.2  4224911.0  360  27.954  0.0  9.75
1  1
'W-S RAMP F-G'  'AG'  458814.2  4224911.0  458852.8  4224878.8  360  27.954  0.0  9.75
1  1
'W-S RAMP G-H'  'AG'  458852.8  4224878.8  458865.5  4224837.1  360  27.954  0.0  9.75
1  1
'W-S RAMP H-SB I164 A'  'AG'  458865.5  4224837.1  458863.5  4224798.1  360  27.954  0.0  9.75
1  1
'EB I64 D-E-N RAMP A'  'AG'  458899.8  4224723.3  458952.6  4224706.8  50  27.954  0.0  9.75
1  1
'E-N RAMP A-B'  'AG'  458952.6  4224706.8  458983.0  4224670.8  50  27.954  0.0  9.75
1  1
'E-N RAMP B-C'  'AG'  458983.0  4224670.8  458986.2  4224621.4  50  27.954  0.0  9.75
1  1
'E-N RAMP C-D'  'AG'  458986.2  4224621.4  458963.4  4224579.8  50  27.954  0.0  9.75
1  1
'E-N RAMP D-E'  'AG'  458963.4  4224579.8  458926.1  4224560.8  50  27.954  0.0  9.75
1  1
'E-N RAMP E-F'  'AG'  458926.1  4224560.8  458883.1  4224564.6  50  27.954  0.0  9.75
1  1
'E-N RAMP F-G'  'AG'  458883.1  4224564.6  458846.5  4224588.6  50  27.954  0.0  9.75
1  1
'E-N RAMP G-H'  'AG'  458846.5  4224588.6  458830.6  4224630.3  50  27.954  0.0  9.75
1  1
'E-N RAMP H-NB I164 C'  'AG'  458830.6  4224630.3  458831.1  4224673.2  50  27.954  0.0  9.75
1  1
'NB I164 A-N-E RAMP A'  'AG'  458687.8  4224258.1  458737.7  4224376.2  430  27.954  0.0  9.75
1  1
'N-E RAMP A-B'  'AG'  458737.7  4224376.2  458765.5  4224414.1  430  27.954  0.0  9.75
1  1
'N-E RAMP B-C'  'AG'  458765.5  4224414.1  458815.4  4224455.2  430  27.954  0.0  9.75
1  1
'N-E RAMP C-D'  'AG'  458815.4  4224455.2  459125.8  4224682.8  430  27.954  0.0  9.75
1  1
'N-E RAMP D-E'  'AG'  459125.8  4224682.8  459180.2  4224707.5  430  27.954  0.0  9.75
1  1
'N-E RAMP E-F'  'AG'  459180.2  4224707.5  459227.6  4224716.3  430  27.954  0.0  9.75
1  1
'N-E RAMP F-EB I64 E'  'AG'  459227.6  4224716.3  459336.3  4224721.7  430  27.954  0.0  9.75
1  1
'SB SR57 D-S-W RAMP A'  'AG'  458919.2  4224944.4  458886.9  4224914.2  60  27.954  0.0  9.75
1  1
'S-W RAMP A-B'  'AG'  458886.9  4224914.2  458860.4  4224909.2  60  27.954  0.0  9.75
1  1
'S-W RAMP B-C'  'AG'  458860.4  4224909.2  458797.8  4224930.0  60  27.954  0.0  9.75
1  1
'S-W RAMP C-D'  'AG'  458797.8  4224930.0  458757.3  4224926.9  60  27.954  0.0  9.75
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1  1
'S-W RAMP D-E'  'AG'  458757.3  4224926.9  458718.8  4224902.9  60  27.954  0.0  9.75
1  1
'S-W RAMP E-F'  'AG'  458718.8  4224902.9  458621.4  4224803.6  60  27.954  0.0  9.75
1  1
'S-W RAMP F-G'  'AG'  458621.4  4224803.6  458567.0  4224773.3  60  27.954  0.0  9.75
1  1
'S-W RAMP G-H'  'AG'  458567.0  4224773.3  458520.2  4224761.9  60  27.954  0.0  9.75
1  1
'S-W RAMP H-WB I64 E'  'AG'  458520.2  4224761.9  458363.0  4224753.3  60  27.954  0.0  9.75
1  1
'WB I64 B-W-N RAMP A'  'AG'  459357.4  4224751.3  459221.3  4224766.3  60  27.954  0.0  9.75
1  1
'W-N RAMP A-B'  'AG'  459221.3  4224766.3  459165.1  4224786.5  60  27.954  0.0  9.75
1  1
'W-N RAMP B-C'  'AG'  459165.1  4224786.5  459122.7  4224818.7  60  27.954  0.0  9.75
1  1
'W-N RAMP C-D'  'AG'  459122.7  4224818.7  459043.1  4224912.3  60  27.954  0.0  9.75
1  1
'W-N RAMP D-E'  'AG'  459043.1  4224912.3  458995.0  4224933.8  60  27.954  0.0  9.75
1  1
'W-N RAMP E-NB SR57 A'  'AG'  458995.0  4224933.8  458942.1  4224960.0  60  27.954  0.0  9.75
1  1
'EB I64 B-E-S RAMP A'  'AG'  458344.6  4224725.6  458481.1  4224707.5  490  27.954  0.0  9.75
1  1
'E-S RAMP A-B'  'AG'  458481.1  4224707.5  458548.1  4224678.4  490  27.954  0.0  9.75
1  1
'E-S RAMP B-C'  'AG'  458548.1  4224678.4  458598.0  4224631.6  490  27.954  0.0  9.75
1  1
'E-S RAMP C-D'  'AG'  458598.0  4224631.6  458664.4  4224548.1  490  27.954  0.0  9.75
1  1
'E-S RAMP D-E'  'AG'  458664.4  4224548.1  458687.2  4224491.9  490  27.954  0.0  9.75
1  1
'E-S RAMP E-F'  'AG'  458687.2  4224491.9  458692.8  4224416.6  490  27.954  0.0  9.75
1  1
'E-S RAMP F-SB I164 C'  'AG'  458692.8  4224416.6  458678.3  4224342.9  490  27.954  0.0  9.75
1.0  0  4  1000.0  2.0  'Y'  10  0  35
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CAL3QHC - (DATED 95221)

CAL3QHC PC (32 BIT) VERSION 3.0.0
(C) COPYRIGHT 1993-2000, TRINITY CONSULTANTS

Run Began on 7/14/2005 at 13:46:29

JOB: I-69 SECTION 1 RUN: EXISTING HOTSPOT

DATE : 07/14/ 0
TIME : 13:46:29

The MODE flag has been set to C for calculating CO averages.

SITE & METEOROLOGICAL VARIABLES

VS = 0.0 CM/S VD = 0.0 CM/S Z0 = 108. CM
U = 1.0 M/S CLAS = 4 (D) ATIM = 60. MINUTES MIXH = 1000. M AMB = 2.0 PPM

LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (M) X1	Y1	X2	Y2	LENGTH (M)	BRG (DEG)	TYPE	VPH	EF (G/MI)	H (M)	W (M)	V/C	QUEUE (VEH)
1. EB I64 A-B	457880.6	********	458344.6	********	464.	90.	AG	710.	23.4	0.0	13.4		
2. EB I64 B-C	458344.6	********	458747.0	********	402.	90.	AG	220.	23.4	0.0	13.4		
3. EB I64 C-D	458747.0	********	458899.8	********	153.	90.	BR	280.	23.4	6.1	13.4		
4. EB I64 D-E	458899.8	********	459336.3	********	437.	90.	AG	230.	23.4	0.0	13.4		
5. EB I64 E-F	459336.3	********	459811.3	********	475.	90.	AG	660.	23.4	0.0	13.4		
6. WB I64 A-B	459807.0	********	459357.4	********	450.	271.	AG	620.	23.4	0.0	13.4		
7. WB I64 B-C	459357.4	********	458966.2	********	391.	270.	AG	560.	23.4	0.0	13.4		
8. WB I64 C-D	458966.2	********	458793.0	********	173.	270.	BR	880.	23.4	6.1	13.4		
9. WB I64 D-E	458793.0	********	458363.0	********	430.	270.	AG	520.	23.4	0.0	13.4		
10. WB I64 E-F	458363.0	********	457883.0	********	480.	270.	AG	580.	23.4	0.0	13.4		
11. SB SR57 A-B	459102.0	********	459006.8	********	214.	206.	AG	560.	20.1	0.0	13.4		
12. SB SR57 B-C	459006.8	********	458960.5	********	129.	201.	AG	560.	20.1	0.0	13.4		
13. SB SR57 C-D	458960.5	********	458919.2	********	117.	201.	AG	530.	20.1	0.0	13.4		
14. SB SR57 D-SB I164 A	458919.2	********	458863.5	********	157.	201.	AG	470.	20.1	0.0	13.4		
15. SB I164 A-B	458863.5	********	458792.8	********	192.	202.	AG	830.	23.4	0.0	13.4		
16. SB I164 B-C	458792.8	********	458678.3	********	299.	203.	AG	770.	23.4	0.0	13.4		
17. SB I164 C-D	458678.3	********	458648.6	********	103.	197.	AG	1260.	23.4	0.0	13.4		
18. NB I164 A-B	458687.8	********	458719.3	********	117.	16.	AG	800.	23.4	0.0	13.4		
19. NB I164 B-C	458719.3	********	458831.1	********	322.	20.	AG	800.	23.4	0.0	13.4		
20. NB I164 C-D	458831.1	********	458903.7	********	201.	21.	AG	850.	23.4	0.0	13.4		
21. NB I164 D-NB SR57 A	458903.7	********	458942.1	********	107.	21.	AG	530.	23.4	0.0	13.4		
22. NB SR57 A-B	458942.1	********	458978.3	********	101.	21.	AG	590.	20.1	0.0	13.4		
23. NB SR57 B-C	458978.3	********	459069.7	********	241.	22.	AG	570.	20.1	0.0	13.4		
24. NB SR57 C-D	459069.7	********	459102.0	********	95.	20.	AG	570.	20.1	0.0	13.4		
25. SR57 A - N-W RAMP A	458903.7	********	458939.4	********	53.	43.	AG	320.	28.0	0.0	9.8		
26. N-W RAMP A-B	458939.4	********	458980.5	********	44.	68.	AG	320.	28.0	0.0	9.8		
27. N-W RAMP B-C	458980.5	********	459023.5	********	44.	102.	AG	320.	28.0	0.0	9.8		
28. N-W RAMP C-D	459023.5	********	459053.8	********	42.	133.	AG	320.	28.0	0.0	9.8		
29. N-W RAMP D-E	459053.8	********	459065.8	********	42.	163.	AG	320.	28.0	0.0	9.8		
30. N-W RAMP E-F	459065.8	********	459057.6	********	39.	192.	AG	320.	28.0	0.0	9.8		
31. N-W RAMP F-G	459057.6	********	459027.8	********	43.	224.	AG	320.	28.0	0.0	9.8		

JOB: I-69 SECTION 1 RUN: EXISTING HOTSPOT

DATE : 07/14/ 0
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LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (M) X1	Y1	X2	Y2	LENGTH (M)	BRG (DEG)	TYPE	VPH	EF (G/MI)	H (M)	W (M)	V/C	QUEUE (VEH)
32. N-W RAMP G-WB I64 C	459027.8	********	458966.2	********	64.	255.	AG	320.	28.0	0.0	9.8		
33. SB I164 B-S-E RAMP A	458792.8	********	458754.8	********	58.	221.	AG	60.	28.0	0.0	9.8		
34. S-E RAMP A-B	458754.8	********	458711.8	********	46.	250.	AG	60.	28.0	0.0	9.8		
35. S-E RAMP B-C	458711.8	********	458666.9	********	46.	285.	AG	60.	28.0	0.0	9.8		
36. S-E RAMP C-D	458666.9	********	458636.6	********	46.	319.	AG	60.	28.0	0.0	9.8		
37. S-E RAMP D-E	458636.6	********	458630.9	********	41.	352.	AG	60.	28.0	0.0	9.8		
38. S-E RAMP E-F	458630.9	********	458644.1	********	41.	19.	AG	60.	28.0	0.0	9.8		
39. S-E RAMP F-G	458644.1	********	458677.7	********	43.	52.	AG	60.	28.0	0.0	9.8		
40. S-E RAMP G-EB 164 C	458677.7	********	458747.0	********	70.	81.	AG	60.	28.0	0.0	9.8		
41. WB I64 D-W-S RAMP A	458793.0	********	458734.6	********	63.	291.	AG	360.	28.0	0.0	9.8		
42. W-S RAMP A-B	458734.6	********	458708.6	********	49.	328.	AG	360.	28.0	0.0	9.8		
43. W-S RAMP B-C	458708.6	********	458709.9	********	45.	2.	AG	360.	28.0	0.0	9.8		
44. W-S RAMP C-D	458709.9	********	458734.6	********	44.	34.	AG	360.	28.0	0.0	9.8		
45. W-S RAMP D-E	458734.6	********	458771.2	********	40.	65.	AG	360.	28.0	0.0	9.8		
46. W-S RAMP E-F	458771.2	********	458814.2	********	43.	93.	AG	360.	28.0	0.0	9.8		
47. W-S RAMP F-G	458814.2	********	458852.8	********	50.	130.	AG	360.	28.0	0.0	9.8		
48. W-S RAMP G-H	458852.8	********	458865.5	********	44.	163.	AG	360.	28.0	0.0	9.8		
49. W-S RAMP H-SB I164 A	458865.5	********	458863.5	********	39.	183.	AG	360.	28.0	0.0	9.8		
50. EB I64 D-E-N RAMP A	458899.8	********	458952.6	********	55.	107.	AG	50.	28.0	0.0	9.8		
51. E-N RAMP A-B	458952.6	********	458983.0	********	47.	140.	AG	50.	28.0	0.0	9.8		
52. E-N RAMP B-C	458983.0	********	458986.2	********	50.	176.	AG	50.	28.0	0.0	9.8		
53. E-N RAMP C-D	458986.2	********	458963.4	********	47.	209.	AG	50.	28.0	0.0	9.8		
54. E-N RAMP D-E	458963.4	********	458926.1	********	42.	243.	AG	50.	28.0	0.0	9.8		
55. E-N RAMP E-F	458926.1	********	458883.1	********	43.	275.	AG	50.	28.0	0.0	9.8		
56. E-N RAMP F-G	458883.1	********	458846.5	********	44.	303.	AG	50.	28.0	0.0	9.8		
57. E-N RAMP G-H	458846.5	********	458830.6	********	45.	339.	AG	50.	28.0	0.0	9.8		
58. E-N RAMP H-NB I164 C	458830.6	********	458831.1	********	43.	1.	AG	50.	28.0	0.0	9.8		
59. NB I164 A-N-E RAMP A	458687.8	********	458737.7	********	128.	23.	AG	430.	28.0	0.0	9.8		
60. N-E RAMP A-B	458737.7	********	458765.5	********	47.	36.	AG	430.	28.0	0.0	9.8		
61. N-E RAMP B-C	458765.5	********	458815.4	********	65.	51.	AG	430.	28.0	0.0	9.8		
62. N-E RAMP C-D	458815.4	********	459125.8	********	385.	54.	AG	430.	28.0	0.0	9.8		
63. N-E RAMP D-E	459125.8	********	459180.2	********	60.	66.	AG	430.	28.0	0.0	9.8		
64. N-E RAMP E-F	459180.2	********	459227.6	********	48.	79.	AG	430.	28.0	0.0	9.8		
65. N-E RAMP F-EB I64 E	459227.6	********	459336.3	********	109.	87.	AG	430.	28.0	0.0	9.8		
66. SB SR57 D-S-W RAMP A	458919.2	********	458886.9	********	44.	227.	AG	60.	28.0	0.0	9.8		
67. S-W RAMP A-B	458886.9	********	458860.4	********	27.	259.	AG	60.	28.0	0.0	9.8		
68. S-W RAMP B-C	458860.4	********	458797.8	********	66.	289.	AG	60.	28.0	0.0	9.8		
69. S-W RAMP C-D	458797.8	********	458757.3	********	41.	266.	AG	60.	28.0	0.0	9.8		
70. S-W RAMP D-E	458757.3	********	458718.8	********	45.	238.	AG	60.	28.0	0.0	9.8		
71. S-W RAMP E-F	458718.8	********	458621.4	********	139.	224.	AG	60.	28.0	0.0	9.8		
72. S-W RAMP F-G	458621.4	********	458567.0	********	62.	241.	AG	60.	28.0	0.0	9.8		
73. S-W RAMP G-H	458567.0	********	458520.2	********	48.	256.	AG	60.	28.0	0.0	9.8		
74. S-W RAMP H-WB I64 E	458520.2	********	458363.0	********	157.	267.	AG	60.	28.0	0.0	9.8		
75. WB I64 B-W-N RAMP A	459357.4	********	459221.3	********	137.	276.	AG	60.	28.0	0.0	9.8		
76. W-N RAMP A-B	459221.3	********	459165.1	********	60.	290.	AG	60.	28.0	0.0	9.8		

JOB: I-69 SECTION 1 RUN: EXISTING HOTSPOT

DATE : 07/14/ 0
TIME : 13:46:29

LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (M) X1	Y1	X2	Y2	LENGTH (M)	BRG (DEG)	TYPE	VPH	EF (G/MI)	H (M)	W (M)	V/C	QUEUE (VEH)
77. W-N RAMP B-C	459165.1	********	459122.7	********	53.	307.	AG	60.	28.0	0.0	9.8		
78. W-N RAMP C-D	459122.7	********	459043.1	********	123.	320.	AG	60.	28.0	0.0	9.8		
79. W-N RAMP D-E	459043.1	********	458995.0	********	53.	294.	AG	60.	28.0	0.0	9.8		
80. W-N RAMP E-NB SR57 A	458995.0	********	458942.1	********	59.	296.	AG	60.	28.0	0.0	9.8		
81. EB I64 B-E-S RAMP A	458344.6	********	458481.1	********	138.	98.	AG	490.	28.0	0.0	9.8		
82. E-S RAMP A-B	458481.1	********	458548.1	********	73.	113.	AG	490.	28.0	0.0	9.8		
83. E-S RAMP B-C	458548.1	********	458598.0	********	69.	133.	AG	490.	28.0	0.0	9.8		
84. E-S RAMP C-D	458598.0	********	458664.4	********	107.	142.	AG	490.	28.0	0.0	9.8		
85. E-S RAMP D-E	458664.4	********	458687.2	********	60.	158.	AG	490.	28.0	0.0	9.8		
86. E-S RAMP E-F	458687.2	********	458692.8	********	76.	176.	AG	490.	28.0	0.0	9.8		
87. E-S RAMP F-SB I164 C	458692.8	********	458678.3	********	75.	191.	AG	490.	28.0	0.0	9.8		

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE

RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (M) X	Y	Z
1. EXIST. HOTSPOT - 10	458722.7	********	1.8
2. EXIST. HOTSPOT - 50	458734.3	********	1.8
3. EXIST. HOTSPOT - 100	458748.7	********	1.8
4. EXIST. HOTSPOT - 150	458763.3	********	1.8

JOB: I-69 SECTION 1 RUN: EXISTING HOTSPOT

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR)	CONCENTRATION (PPM) REC1	REC2	REC3	REC4
0.	3.2	2.8	2.4	2.4
10.	3.2	2.7	2.5	2.4
20.	2.8	2.4	2.2	2.0
30.	2.4	2.2	2.1	2.1
40.	2.1	2.1	2.1	2.1
50.	2.1	2.1	2.0	2.0
60.	2.0	2.0	2.0	2.0
70.	2.0	2.0	2.0	2.0
80.	2.0	2.0	2.0	2.0
90.	2.0	2.0	2.0	2.0
100.	2.0	2.0	2.0	2.0
110.	2.0	2.0	2.0	2.0
120.	2.0	2.0	2.0	2.0
130.	2.0	2.0	2.0	2.0
140.	2.0	2.0	2.0	2.0
150.	2.0	2.0	2.0	2.0
160.	2.0	2.0	2.0	2.0
170.	2.0	2.0	2.0	2.0
180.	2.0	2.0	2.0	2.0
190.	2.1	2.0	2.0	2.0
200.	2.4	2.0	2.0	2.0
210.	2.7	2.2	2.0	2.0
220.	3.0	2.5	2.1	2.0
230.	3.2	2.7	2.3	2.1
240.	3.1	2.7	2.5	2.3
250.	3.1	2.8	2.5	2.5
260.	3.1	2.8	2.5	2.5
270.	3.0	2.7	2.5	2.5
280.	3.0	2.7	2.5	2.5
290.	3.0	2.8	2.5	2.4
300.	3.0	2.8	2.6	2.6
310.	2.9	2.7	2.5	2.5
320.	3.1	2.8	2.5	2.5
330.	3.1	2.8	2.5	2.5
340.	3.2	2.9	2.7	2.4
350.	3.3	2.8	2.6	2.4
MAX	3.3	2.9	2.7	2.6
DEGR.	350	340	340	300

THE HIGHEST CONCENTRATION OF 3.30 PPM OCCURRED AT RECEPTOR REC1 .

2030 NO-BUILD ALTERNATIVE

```
'I-69 SECTION 1'  60.0  108.0  0.0  0.0  4  1  0  0  'PPM'
'EXIST. HOTSPOT - 10'  458722.7  4224320.5  1.8
'EXIST. HOTSPOT - 50'  458734.3  4224316.6  1.8
'EXIST. HOTSPOT - 100'  458748.7  4224312.0  1.8
'EXIST. HOTSPOT - 150'  458763.3  4224307.3  1.8
'NO-BUILD HOTSPOT'  87  1  0  'C'
1  1
'EB I64 A-B'  'AG'  457880.6  4224727.1  458344.6  4224725.6  911  5.98  0.0  13.41
1  1
'EB I64 B-C'  'AG'  458344.6  4224725.6  458747.0  4224723.8  644  5.98  0.0  13.41
1  1
'EB I64 C-D'  'BR'  458747.0  4224723.8  458899.8  4224723.3  651  5.98  6.1  13.41
1  1
'EB I64 D-E'  'AG'  458899.8  4224723.3  459336.3  4224721.7  532  5.98  0.0  13.41
1  1
'EB I64 E-F'  'AG'  459336.3  4224721.7  459811.3  4224720.5  948  5.98  0.0  13.41
1  1
'WB I64 A-B'  'AG'  459807.0  4224747.7  459357.4  4224751.3  835  5.98  0.0  13.41
1  1
'WB I64 B-C'  'AG'  459357.4  4224751.3  458966.2  4224751.4  824  5.98  0.0  13.41
1  1
'WB I64 C-D'  'BR'  458966.2  4224751.4  458793.0  4224751.4  1071  5.98  6.1  13.41
1  1
'WB I64 D-E'  'AG'  458793.0  4224751.4  458363.0  4224753.3  721  5.98  0.0  13.41
1  1
'WB I64 E-F'  'AG'  458363.0  4224753.3  457883.0  4224755.2  823  5.98  0.0  13.41
1  1
'SB SR57 A-B'  'AG'  459102.0  4225366.1  459006.8  4225173.9  337  5.875  0.0  13.41
1  1
'SB SR57 B-C'  'AG'  459006.8  4225173.9  458960.5  4225053.3  337  5.875  0.0  13.41
1  1
'SB SR57 C-D'  'AG'  458960.5  4225053.3  458919.2  4224944.4  409  5.875  0.0  13.41
1  1
'SB SR57 D-SB I164 A'  'AG'  458919.2  4224944.4  458863.5  4224798.1  307  5.875  0.0  13.41
1  1
'SB I164 A-B'  'AG'  458863.5  4224798.1  458792.8  4224619.0  656  5.98  0.0  13.41
1  1
'SB I164 B-C'  'AG'  458792.8  4224619.0  458678.3  4224342.9  649  5.98  0.0  13.41
1  1
'SB I164 C-D'  'AG'  458678.3  4224342.9  458648.6  4224244.1  916  5.98  0.0  13.41
1  1
'NB I164 A-B'  'AG'  458687.8  4224258.1  458719.3  4224370.9  679  5.98  0.0  13.41
1  1
'NB I164 B-C'  'AG'  458719.3  4224370.9  458831.1  4224673.2  679  5.98  0.0  13.41
1  1
'NB I164 C-D'  'AG'  458831.1  4224673.2  458903.7  4224860.2  799  5.98  0.0  13.41
1  1
'NB I164 D-NB SR57 A'  'AG'  458903.7  4224860.2  458942.1  4224960.0  522  5.98  0.0  13.41
1  1
'NB SR57 A-B'  'AG'  458942.1  4224960.0  458978.3  4225054.0  563  5.875  0.0  13.41
1  1
'NB SR57 B-C'  'AG'  458978.3  4225054.0  459069.7  4225277.0  501  5.875  0.0  13.41
1  1
'NB SR57 C-D'  'AG'  459069.7  4225277.0  459102.0  4225366.1  501  5.875  0.0  13.41
1  1
'SR57 A - N-W RAMP A'  'AG'  458903.7  4224860.2  458939.4  4224898.4  247  5.98  0.0  9.75
1  1
'N-W RAMP A-B'  'AG'  458939.4  4224898.4  458980.5  4224914.9  247  5.98  0.0  9.75
1  1
'N-W RAMP B-C'  'AG'  458980.5  4224914.9  459023.5  4224905.4  247  5.98  0.0  9.75
1  1
'N-W RAMP C-D'  'AG'  459023.5  4224905.4  459053.8  4224877.0  247  5.98  0.0  9.75
1  1
'N-W RAMP D-E'  'AG'  459053.8  4224877.0  459065.8  4224836.5  247  5.98  0.0  9.75
1  1
'N-W RAMP E-F'  'AG'  459065.8  4224836.5  459057.6  4224797.9  247  5.98  0.0  9.75
1  1
'N-W RAMP F-G'  'AG'  459057.6  4224797.9  459027.8  4224767.6  247  5.98  0.0  9.75
1  1
'N-W RAMP G-WB I64 C'  'AG'  459027.8  4224767.6  458966.2  4224751.4  247  5.98  0.0  9.75
1  1
'SB I164 B-S-E RAMP A'  'AG'  458792.8  4224619.0  458754.8  4224575.3  7  5.98  0.0  9.75
1  1
'S-E RAMP A-B'  'AG'  458754.8  4224575.3  458711.8  4224560.2  7  5.98  0.0  9.75
1  1
'S-E RAMP B-C'  'AG'  458711.8  4224560.2  458666.9  4224572.2  7  5.98  0.0  9.75
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1  1
'S-E RAMP C-D'  'AG'  458666.9  4224572.2  458636.6  4224606.4  7  5.98  0.0  9.75
1  1
'S-E RAMP D-E'  'AG'  458636.6  4224606.4  458630.9  4224647.4  7  5.98  0.0  9.75
1  1
'S-E RAMP E-F'  'AG'  458630.9  4224647.4  458644.1  4224686.6  7  5.98  0.0  9.75
1  1
'S-E RAMP F-G'  'AG'  458644.1  4224686.6  458677.7  4224713.2  7  5.98  0.0  9.75
1  1
'S-E RAMP G-EB 164 C'  'AG'  458677.7  4224713.2  458747.0  4224723.8  7  5.98  0.0  9.75
1  1
'WB I64 D-W-S RAMP A'  'AG'  458793.0  4224751.4  458734.6  4224774.5  349  5.98  0.0  9.75
1  1
'W-S RAMP A-B'  'AG'  458734.6  4224774.5  458708.6  4224815.6  349  5.98  0.0  9.75
1  1
'W-S RAMP B-C'  'AG'  458708.6  4224815.6  458709.9  4224860.5  349  5.98  0.0  9.75
1  1
'W-S RAMP C-D'  'AG'  458709.9  4224860.5  458734.6  4224896.5  349  5.98  0.0  9.75
1  1
'W-S RAMP D-E'  'AG'  458734.6  4224896.5  458771.2  4224913.6  349  5.98  0.0  9.75
1  1
'W-S RAMP E-F'  'AG'  458771.2  4224913.6  458814.2  4224911.0  349  5.98  0.0  9.75
1  1
'W-S RAMP F-G'  'AG'  458814.2  4224911.0  458852.8  4224878.8  349  5.98  0.0  9.75
1  1
'W-S RAMP G-H'  'AG'  458852.8  4224878.8  458865.5  4224837.1  349  5.98  0.0  9.75
1  1
'W-S RAMP H-SB I164 A'  'AG'  458865.5  4224837.1  458863.5  4224798.1  349  5.98  0.0  9.75
1  1
'EB I64 D-E-N RAMP A'  'AG'  458899.8  4224723.3  458952.6  4224706.8  120  5.98  0.0  9.75
1  1
'E-N RAMP A-B'  'AG'  458952.6  4224706.8  458983.0  4224670.8  120  5.98  0.0  9.75
1  1
'E-N RAMP B-C'  'AG'  458983.0  4224670.8  458986.2  4224621.4  120  5.98  0.0  9.75
1  1
'E-N RAMP C-D'  'AG'  458986.2  4224621.4  458963.4  4224579.8  120  5.98  0.0  9.75
1  1
'E-N RAMP D-E'  'AG'  458963.4  4224579.8  458926.1  4224560.8  120  5.98  0.0  9.75
1  1
'E-N RAMP E-F'  'AG'  458926.1  4224560.8  458883.1  4224564.6  120  5.98  0.0  9.75
1  1
'E-N RAMP F-G'  'AG'  458883.1  4224564.6  458846.5  4224588.6  120  5.98  0.0  9.75
1  1
'E-N RAMP G-H'  'AG'  458846.5  4224588.6  458830.6  4224630.3  120  5.98  0.0  9.75
1  1
'E-N RAMP H-NB I164 C'  'AG'  458830.6  4224630.3  458831.1  4224673.2  120  5.98  0.0  9.75
1  1
'NB I164 A-N-E RAMP A'  'AG'  458687.8  4224258.1  458737.7  4224376.2  417  5.98  0.0  9.75
1  1
'N-E RAMP A-B'  'AG'  458737.7  4224376.2  458765.5  4224414.1  417  5.98  0.0  9.75
1  1
'N-E RAMP B-C'  'AG'  458765.5  4224414.1  458815.4  4224455.2  417  5.98  0.0  9.75
1  1
'N-E RAMP C-D'  'AG'  458815.4  4224455.2  459125.8  4224682.8  417  5.98  0.0  9.75
1  1
'N-E RAMP D-E'  'AG'  459125.8  4224682.8  459180.2  4224707.5  417  5.98  0.0  9.75
1  1
'N-E RAMP E-F'  'AG'  459180.2  4224707.5  459227.6  4224716.3  417  5.98  0.0  9.75
1  1
'N-E RAMP F-EB I64 E'  'AG'  459227.6  4224716.3  459336.3  4224721.7  417  5.98  0.0  9.75
1  1
'SB SR57 D-S-W RAMP A'  'AG'  458919.2  4224944.4  458886.9  4224914.2  102  5.98  0.0  9.75
1  1
'S-W RAMP A-B'  'AG'  458886.9  4224914.2  458860.4  4224909.2  102  5.98  0.0  9.75
1  1
'S-W RAMP B-C'  'AG'  458860.4  4224909.2  458797.8  4224930.0  102  5.98  0.0  9.75
1  1
'S-W RAMP C-D'  'AG'  458797.8  4224930.0  458757.3  4224926.9  102  5.98  0.0  9.75
1  1
'S-W RAMP D-E'  'AG'  458757.3  4224926.9  458718.8  4224902.9  102  5.98  0.0  9.75
1  1
'S-W RAMP E-F'  'AG'  458718.8  4224902.9  458621.4  4224803.6  102  5.98  0.0  9.75
1  1
'S-W RAMP F-G'  'AG'  458621.4  4224803.6  458567.0  4224773.3  102  5.98  0.0  9.75
1  1
'S-W RAMP G-H'  'AG'  458567.0  4224773.3  458520.2  4224761.9  102  5.98  0.0  9.75
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1  1
'S-W RAMP H-WB I64 E'  'AG'  458520.2  4224761.9  458363.0  4224753.3  102  5.98  0.0  9.75
1  1
'WB I64 B-W-N RAMP A'  'AG'  459357.4  4224751.3  459221.3  4224766.3  10  5.98  0.0  9.75
1  1
'W-N RAMP A-B'  'AG'  459221.3  4224766.3  459165.1  4224786.5  10  5.98  0.0  9.75
1  1
'W-N RAMP B-C'  'AG'  459165.1  4224786.5  459122.7  4224818.7  10  5.98  0.0  9.75
1  1
'W-N RAMP C-D'  'AG'  459122.7  4224818.7  459043.1  4224912.3  10  5.98  0.0  9.75
1  1
'W-N RAMP D-E'  'AG'  459043.1  4224912.3  458995.0  4224933.8  10  5.98  0.0  9.75
1  1
'W-N RAMP E-NB SR57 A'  'AG'  458995.0  4224933.8  458942.1  4224960.0  10  5.98  0.0  9.75
1  1
'EB I64 B-E-S RAMP A'  'AG'  458344.6  4224725.6  458481.1  4224707.5  267  5.98  0.0  9.75
1  1
'E-S RAMP A-B'  'AG'  458481.1  4224707.5  458548.1  4224678.4  267  5.98  0.0  9.75
1  1
'E-S RAMP B-C'  'AG'  458548.1  4224678.4  458598.0  4224631.6  267  5.98  0.0  9.75
1  1
'E-S RAMP C-D'  'AG'  458598.0  4224631.6  458664.4  4224548.1  267  5.98  0.0  9.75
1  1
'E-S RAMP D-E'  'AG'  458664.4  4224548.1  458687.2  4224491.9  267  5.98  0.0  9.75
1  1
'E-S RAMP E-F'  'AG'  458687.2  4224491.9  458692.8  4224416.6  267  5.98  0.0  9.75
1  1
'E-S RAMP F-SB I164 C'  'AG'  458692.8  4224416.6  458678.3  4224342.9  267  5.98  0.0  9.75
1.0  0  4  1000.0  2.0  'Y'  10  0  35
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CAL3QHC - (DATED 95221)

CAL3QHC PC (32 BIT) VERSION 3.0.0
(C) COPYRIGHT 1993-2000, TRINITY CONSULTANTS

Run Began on 12/03/2006 at 9:30:12

JOB: I-69 SECTION 1 RUN: NO-BUILD HOTSPOT

DATE : 12/03/ 0
TIME : 09:30:12

The MODE flag has been set to C for calculating CO averages.

SITE & METEOROLOGICAL VARIABLES

VS = 0.0 CM/S VD = 0.0 CM/S Z0 = 108. CM
U = 1.0 M/S CLAS = 4 (D) ATIM = 60. MINUTES MIXH = 1000. M AMB = 2.0 PPM

LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (M) X1	Y1	X2	Y2	LENGTH (M)	BRG (DEG)	TYPE	VPH	EF (G/MI)	H (M)	W (M)	V/C	QUEUE (VEH)
1. EB I64 A-B	457880.6	********	458344.6	********	464.	90.	AG	911.	6.0	0.0	13.4		
2. EB I64 B-C	458344.6	********	458747.0	********	402.	90.	AG	644.	6.0	0.0	13.4		
3. EB I64 C-D	458747.0	********	458899.8	********	153.	90.	BR	651.	6.0	6.1	13.4		
4. EB I64 D-E	458899.8	********	459336.3	********	437.	90.	AG	532.	6.0	0.0	13.4		
5. EB I64 E-F	459336.3	********	459811.3	********	475.	90.	AG	948.	6.0	0.0	13.4		
6. WB I64 A-B	459807.0	********	459357.4	********	450.	271.	AG	835.	6.0	0.0	13.4		
7. WB I64 B-C	459357.4	********	458966.2	********	391.	270.	AG	824.	6.0	0.0	13.4		
8. WB I64 C-D	458966.2	********	458793.0	********	173.	270.	BR	1071.	6.0	6.1	13.4		
9. WB I64 D-E	458793.0	********	458363.0	********	430.	270.	AG	721.	6.0	0.0	13.4		
10. WB I64 E-F	458363.0	********	457883.0	********	480.	270.	AG	823.	6.0	0.0	13.4		
11. SB SR57 A-B	459102.0	********	459006.8	********	214.	206.	AG	337.	5.9	0.0	13.4		
12. SB SR57 B-C	459006.8	********	458960.5	********	129.	201.	AG	337.	5.9	0.0	13.4		
13. SB SR57 C-D	458960.5	********	458919.2	********	117.	201.	AG	409.	5.9	0.0	13.4		
14. SB SR57 D-SB I164 A	458919.2	********	458863.5	********	157.	201.	AG	307.	5.9	0.0	13.4		
15. SB I164 A-B	458863.5	********	458792.8	********	192.	202.	AG	656.	6.0	0.0	13.4		
16. SB I164 B-C	458792.8	********	458678.3	********	299.	203.	AG	649.	6.0	0.0	13.4		
17. SB I164 C-D	458678.3	********	458648.6	********	103.	197.	AG	916.	6.0	0.0	13.4		
18. NB I164 A-B	458687.8	********	458719.3	********	117.	16.	AG	679.	6.0	0.0	13.4		
19. NB I164 B-C	458719.3	********	458831.1	********	322.	20.	AG	679.	6.0	0.0	13.4		
20. NB I164 C-D	458831.1	********	458903.7	********	201.	21.	AG	799.	6.0	0.0	13.4		
21. NB I164 D-NB SR57 A	458903.7	********	458942.1	********	107.	21.	AG	522.	6.0	0.0	13.4		
22. NB SR57 A-B	458942.1	********	458978.3	********	101.	21.	AG	563.	5.9	0.0	13.4		
23. NB SR57 B-C	458978.3	********	459069.7	********	241.	22.	AG	501.	5.9	0.0	13.4		
24. NB SR57 C-D	459069.7	********	459102.0	********	95.	20.	AG	501.	5.9	0.0	13.4		
25. SR57 A - N-W RAMP A	458903.7	********	458939.4	********	53.	43.	AG	247.	6.0	0.0	9.8		
26. N-W RAMP A-B	458939.4	********	458980.5	********	44.	68.	AG	247.	6.0	0.0	9.8		
27. N-W RAMP B-C	458980.5	********	459023.5	********	44.	102.	AG	247.	6.0	0.0	9.8		
28. N-W RAMP C-D	459023.5	********	459053.8	********	42.	133.	AG	247.	6.0	0.0	9.8		
29. N-W RAMP D-E	459053.8	********	459065.8	********	42.	163.	AG	247.	6.0	0.0	9.8		
30. N-W RAMP E-F	459065.8	********	459057.6	********	39.	192.	AG	247.	6.0	0.0	9.8		
31. N-W RAMP F-G	459057.6	********	459027.8	********	43.	224.	AG	247.	6.0	0.0	9.8		
32. N-W RAMP G-WB I64 C	459027.8	********	458966.2	********	64.	255.	AG	247.	6.0	0.0	9.8		
33. SB I164 B-S-E RAMP A	458792.8	********	458754.8	********	58.	221.	AG	7.	6.0	0.0	9.8		
34. S-E RAMP A-B	458754.8	********	458711.8	********	46.	250.	AG	7.	6.0	0.0	9.8		
35. S-E RAMP B-C	458711.8	********	458666.9	********	46.	285.	AG	7.	6.0	0.0	9.8		

JOB: I-69 SECTION 1 RUN: NO-BUILD HOTSPOT

DATE : 12/03/ 0
TIME : 09:30:12

LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (M) X1	Y1	X2	Y2	LENGTH (M)	BRG (DEG)	TYPE	VPH	EF (G/MI)	H (M)	W (M)	V/C	QUEUE (VEH)
36. S-E RAMP C-D	458666.9	********	458636.6	********	46.	319.	AG	7.	6.0	0.0	9.8		
37. S-E RAMP D-E	458636.6	********	458630.9	********	41.	352.	AG	7.	6.0	0.0	9.8		
38. S-E RAMP E-F	458630.9	********	458644.1	********	41.	19.	AG	7.	6.0	0.0	9.8		
39. S-E RAMP F-G	458644.1	********	458677.7	********	43.	52.	AG	7.	6.0	0.0	9.8		
40. S-E RAMP G-EB 164 C	458677.7	********	458747.0	********	70.	81.	AG	7.	6.0	0.0	9.8		
41. WB I64 D-W-S RAMP A	458793.0	********	458734.6	********	63.	291.	AG	349.	6.0	0.0	9.8		
42. W-S RAMP A-B	458734.6	********	458708.6	********	49.	328.	AG	349.	6.0	0.0	9.8		
43. W-S RAMP B-C	458708.6	********	458709.9	********	45.	2.	AG	349.	6.0	0.0	9.8		
44. W-S RAMP C-D	458709.9	********	458734.6	********	44.	34.	AG	349.	6.0	0.0	9.8		
45. W-S RAMP D-E	458734.6	********	458771.2	********	40.	65.	AG	349.	6.0	0.0	9.8		
46. W-S RAMP E-F	458771.2	********	458814.2	********	43.	93.	AG	349.	6.0	0.0	9.8		
47. W-S RAMP F-G	458814.2	********	458852.8	********	50.	130.	AG	349.	6.0	0.0	9.8		
48. W-S RAMP G-H	458852.8	********	458865.5	********	44.	163.	AG	349.	6.0	0.0	9.8		
49. W-S RAMP H-SB I164 A	458865.5	********	458863.5	********	39.	183.	AG	349.	6.0	0.0	9.8		
50. EB I64 D-E-N RAMP A	458899.8	********	458952.6	********	55.	107.	AG	120.	6.0	0.0	9.8		
51. E-N RAMP A-B	458952.6	********	458983.0	********	47.	140.	AG	120.	6.0	0.0	9.8		
52. E-N RAMP B-C	458983.0	********	458986.2	********	50.	176.	AG	120.	6.0	0.0	9.8		
53. E-N RAMP C-D	458986.2	********	458963.4	********	47.	209.	AG	120.	6.0	0.0	9.8		
54. E-N RAMP D-E	458963.4	********	458926.1	********	42.	243.	AG	120.	6.0	0.0	9.8		
55. E-N RAMP E-F	458926.1	********	458883.1	********	43.	275.	AG	120.	6.0	0.0	9.8		
56. E-N RAMP F-G	458883.1	********	458846.5	********	44.	303.	AG	120.	6.0	0.0	9.8		
57. E-N RAMP G-H	458846.5	********	458830.6	********	45.	339.	AG	120.	6.0	0.0	9.8		
58. E-N RAMP H-NB I164 C	458830.6	********	458831.1	********	43.	1.	AG	120.	6.0	0.0	9.8		
59. NB I164 A-N-E RAMP A	458687.8	********	458737.7	********	128.	23.	AG	417.	6.0	0.0	9.8		
60. N-E RAMP A-B	458737.7	********	458765.5	********	47.	36.	AG	417.	6.0	0.0	9.8		
61. N-E RAMP B-C	458765.5	********	458815.4	********	65.	51.	AG	417.	6.0	0.0	9.8		
62. N-E RAMP C-D	458815.4	********	459125.8	********	385.	54.	AG	417.	6.0	0.0	9.8		
63. N-E RAMP D-E	459125.8	********	459180.2	********	60.	66.	AG	417.	6.0	0.0	9.8		
64. N-E RAMP E-F	459180.2	********	459227.6	********	48.	79.	AG	417.	6.0	0.0	9.8		
65. N-E RAMP F-EB I64 E	459227.6	********	459336.3	********	109.	87.	AG	417.	6.0	0.0	9.8		
66. SB SR57 D-S-W RAMP A	458919.2	********	458886.9	********	44.	227.	AG	102.	6.0	0.0	9.8		
67. S-W RAMP A-B	458886.9	********	458860.4	********	27.	259.	AG	102.	6.0	0.0	9.8		
68. S-W RAMP B-C	458860.4	********	458797.8	********	66.	289.	AG	102.	6.0	0.0	9.8		
69. S-W RAMP C-D	458797.8	********	458757.3	********	41.	266.	AG	102.	6.0	0.0	9.8		
70. S-W RAMP D-E	458757.3	********	458718.8	********	45.	238.	AG	102.	6.0	0.0	9.8		
71. S-W RAMP E-F	458718.8	********	458621.4	********	139.	224.	AG	102.	6.0	0.0	9.8		
72. S-W RAMP F-G	458621.4	********	458567.0	********	62.	241.	AG	102.	6.0	0.0	9.8		
73. S-W RAMP G-H	458567.0	********	458520.2	********	48.	256.	AG	102.	6.0	0.0	9.8		
74. S-W RAMP H-WB I64 E	458520.2	********	458363.0	********	157.	267.	AG	102.	6.0	0.0	9.8		
75. WB I64 B-W-N RAMP A	459357.4	********	459221.3	********	137.	276.	AG	10.	6.0	0.0	9.8		
76. W-N RAMP A-B	459221.3	********	459165.1	********	60.	290.	AG	10.	6.0	0.0	9.8		
77. W-N RAMP B-C	459165.1	********	459122.7	********	53.	307.	AG	10.	6.0	0.0	9.8		
78. W-N RAMP C-D	459122.7	********	459043.1	********	123.	320.	AG	10.	6.0	0.0	9.8		
79. W-N RAMP D-E	459043.1	********	458995.0	********	53.	294.	AG	10.	6.0	0.0	9.8		
80. W-N RAMP E-NB SR57 A	458995.0	********	458942.1	********	59.	296.	AG	10.	6.0	0.0	9.8		
81. EB I64 B-E-S RAMP A	458344.6	********	458481.1	********	138.	98.	AG	267.	6.0	0.0	9.8		
82. E-S RAMP A-B	458481.1	********	458548.1	********	73.	113.	AG	267.	6.0	0.0	9.8		
83. E-S RAMP B-C	458548.1	********	458598.0	********	69.	133.	AG	267.	6.0	0.0	9.8		

JOB: I-69 SECTION 1 RUN: NO-BUILD HOTSPOT

DATE : 12/03/ 0
TIME : 09:30:12

LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (M) X1	Y1	X2	Y2	LENGTH (M)	BRG (DEG)	TYPE	VPH	EF (G/MI)	H (M)	W (M)	V/C	QUEUE (VEH)
84. E-S RAMP C-D	458598.0	********	458664.4	********	107.	142.	AG	267.	6.0	0.0	9.8		
85. E-S RAMP D-E	458664.4	********	458687.2	********	60.	158.	AG	267.	6.0	0.0	9.8		
86. E-S RAMP E-F	458687.2	********	458692.8	********	76.	176.	AG	267.	6.0	0.0	9.8		
87. E-S RAMP F-SB I164 C	458692.8	********	458678.3	********	75.	191.	AG	267.	6.0	0.0	9.8		

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE

RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (M) X	Y	Z
1. EXIST. HOTSPOT - 10	458722.7	********	1.8
2. EXIST. HOTSPOT - 50	458734.3	********	1.8
3. EXIST. HOTSPOT - 100	458748.7	********	1.8
4. EXIST. HOTSPOT - 150	458763.3	********	1.8

JOB: I-69 SECTION 1 RUN: NO-BUILD HOTSPOT

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR)	CONCENTRATION (PPM) REC1	REC2	REC3	REC4
0.	2.2	2.1	2.1	2.0
10.	2.2	2.1	2.0	2.0
20.	2.2	2.0	2.0	2.0
30.	2.0	2.0	2.0	2.0
40.	2.0	2.0	2.0	2.0
50.	2.0	2.0	2.0	2.0
60.	2.0	2.0	2.0	2.0
70.	2.0	2.0	2.0	2.0
80.	2.0	2.0	2.0	2.0
90.	2.0	2.0	2.0	2.0
100.	2.0	2.0	2.0	2.0
110.	2.0	2.0	2.0	2.0
120.	2.0	2.0	2.0	2.0
130.	2.0	2.0	2.0	2.0
140.	2.0	2.0	2.0	2.0
150.	2.0	2.0	2.0	2.0
160.	2.0	2.0	2.0	2.0
170.	2.0	2.0	2.0	2.0
180.	2.0	2.0	2.0	2.0
190.	2.0	2.0	2.0	2.0
200.	2.0	2.0	2.0	2.0
210.	2.2	2.0	2.0	2.0
220.	2.2	2.0	2.0	2.0
230.	2.2	2.1	2.0	2.0
240.	2.3	2.1	2.0	2.0
250.	2.3	2.1	2.0	2.0
260.	2.3	2.1	2.0	2.0
270.	2.3	2.1	2.0	2.0
280.	2.3	2.1	2.0	2.0
290.	2.2	2.1	2.0	2.0
300.	2.2	2.1	2.0	2.0
310.	2.2	2.1	2.0	2.0
320.	2.2	2.1	2.0	2.0
330.	2.2	2.1	2.0	2.0
340.	2.2	2.0	2.0	2.0
350.	2.2	2.0	2.0	2.0
MAX	2.3	2.1	2.1	2.0
DEGR.	280	330	0	0

THE HIGHEST CONCENTRATION OF 2.30 PPM OCCURRED AT RECEPTOR REC1 .

2030 BUILD ALTERNATIVE

```
'I-69 SECTION 1'  60.0  0.1  0.0  0.0  8  1  0  0
'NB-10'  458694.2  4224279.2  1.8
'NB-50'  458705.2  4224275.7  1.8
'NB-100'  458719.6  4224271.1  1.8
'NB-150'  458734.2  4224266.6  1.8
'SB-10'  458656.1  4224290.4  1.8
'SB-50'  458644.5  4224293.8  1.8
'SB-100'  458630.3  4224299.3  1.8
'SB-150'  458615.6  4224303.7  1.8
'BUILD FREEFLOW'  2  1  0  'C'
1
'SB I-69 FREEFLOW'  'AG'  458727.2  4224536.1  458583.2  4223983.2  1752  5.98  0.0  13.41
1
'NB I-69 FREEFLOW'  'AG'  458608.6  4223980.7  458753.0  4224530.9  2009  5.98  0.0  13.41
1.0  0  4  1000.0  2.0  'Y'  10  0  35
```

CAL3QHC - (DATED 95221)

CAL3QHC PC (32 BIT) VERSION 3.0.0
(C) COPYRIGHT 1993-2000, TRINITY CONSULTANTS

Run Began on 7/14/2005 at 17:53:41

JOB: I-69 SECTION 1 RUN: BUILD FREEFLOW

DATE : 07/14/ 0
TIME : 17:53:41

The MODE flag has been set to C for calculating CO averages.

SITE & METEOROLOGICAL VARIABLES

VS = 0.0 CM/S VD = 0.0 CM/S Z0 = 0. CM
U = 1.0 M/S CLAS = 4 (D) ATIM = 60. MINUTES MIXH = 1000. M AMB = 2.0 PPM

LINK VARIABLES

LINK DESCRIPTION	* LINK COORDINATES (M) X1	Y1	X2	Y2	* LENGTH (M)	BRG (DEG)	TYPE	VPH	EF (G/MI)	H (M)	W (M)	V/C	QUEUE (VEH)
1. SB I-69 FREEFLOW	458727.2	********	458583.2	********	571.	195.	AG	1752.	6.0	0.0	13.4		
2. NB I-69 FREEFLOW	458608.6	********	458753.0	********	569.	15.	AG	2009.	6.0	0.0	13.4		

JOB: I-69 SECTION 1 RUN: BUILD FREEFLOW

DATE : 07/14/ 0
TIME : 17:53:41

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE

RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (M) X	Y	Z
1. NB-10	458694.2	********	1.8
2. NB-50	458705.2	********	1.8
3. NB-100	458719.6	********	1.8
4. NB-150	458734.2	********	1.8
5. SB-10	458656.1	********	1.8
6. SB-50	458644.5	********	1.8
7. SB-100	458630.3	********	1.8
8. SB-150	458615.6	********	1.8

JOB: I-69 SECTION 1 RUN: BUILD FREEFLOW

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR)	CONCENTRATION (PPM) REC1	REC2	REC3	REC4	REC5	REC6	REC7	REC8
0.	3.2	2.6	2.4	2.3	2.0	2.0	2.0	2.0
10.	3.3	2.3	2.1	2.0	2.3	2.0	2.0	2.0
20.	2.2	2.0	2.0	2.0	3.2	2.3	2.1	2.0
30.	2.0	2.0	2.0	2.0	3.1	2.6	2.3	2.3
40.	2.0	2.0	2.0	2.0	2.7	2.5	2.4	2.3
50.	2.0	2.0	2.0	2.0	2.6	2.5	2.4	2.2
60.	2.0	2.0	2.0	2.0	2.6	2.4	2.3	2.2
70.	2.0	2.0	2.0	2.0	2.6	2.4	2.3	2.2
80.	2.0	2.0	2.0	2.0	2.5	2.3	2.2	2.2
90.	2.0	2.0	2.0	2.0	2.5	2.3	2.3	2.2
100.	2.0	2.0	2.0	2.0	2.5	2.3	2.3	2.2
110.	2.0	2.0	2.0	2.0	2.5	2.3	2.3	2.2
120.	2.0	2.0	2.0	2.0	2.5	2.3	2.3	2.2
130.	2.0	2.0	2.0	2.0	2.5	2.3	2.2	2.2
140.	2.0	2.0	2.0	2.0	2.6	2.4	2.3	2.2
150.	2.0	2.0	2.0	2.0	2.6	2.4	2.3	2.2
160.	2.0	2.0	2.0	2.0	2.6	2.5	2.4	2.2
170.	2.0	2.0	2.0	2.0	2.9	2.5	2.4	2.4
180.	2.0	2.0	2.0	2.0	3.1	2.6	2.5	2.3
190.	2.3	2.0	2.0	2.0	3.2	2.4	2.1	2.0
200.	3.4	2.5	2.2	2.1	2.2	2.0	2.0	2.0
210.	3.2	2.6	2.5	2.3	2.0	2.0	2.0	2.0
220.	2.8	2.6	2.3	2.3	2.0	2.0	2.0	2.0
230.	2.7	2.5	2.3	2.3	2.0	2.0	2.0	2.0
240.	2.6	2.4	2.3	2.3	2.0	2.0	2.0	2.0
250.	2.6	2.4	2.3	2.3	2.0	2.0	2.0	2.0
260.	2.6	2.4	2.3	2.2	2.0	2.0	2.0	2.0
270.	2.6	2.3	2.3	2.2	2.0	2.0	2.0	2.0
280.	2.6	2.3	2.3	2.2	2.0	2.0	2.0	2.0
290.	2.6	2.3	2.3	2.2	2.0	2.0	2.0	2.0
300.	2.6	2.3	2.3	2.2	2.0	2.0	2.0	2.0
310.	2.6	2.4	2.3	2.2	2.0	2.0	2.0	2.0
320.	2.6	2.4	2.3	2.3	2.0	2.0	2.0	2.0
330.	2.6	2.4	2.3	2.3	2.0	2.0	2.0	2.0
340.	2.7	2.5	2.3	2.3	2.0	2.0	2.0	2.0
350.	2.8	2.6	2.3	2.3	2.0	2.0	2.0	2.0
MAX	3.4	2.6	2.5	2.3	3.2	2.6	2.5	2.4
DEGR.	200	350	210	350	20	180	180	170

THE HIGHEST CONCENTRATION OF 3.40 PPM OCCURRED AT RECEPTOR REC1 .

```
'I-69 SECTION 1'  60.0  108.0  0.0  0.0  4  1  0  0  'PPM'
'EXIST. HOTSPOT - 10'  458722.7  4224320.5  1.8
'EXIST. HOTSPOT - 50'  458734.3  4224316.6  1.8
'EXIST. HOTSPOT - 100'  458748.7  4224312.0  1.8
'EXIST. HOTSPOT - 150'  458763.3  4224307.3  1.8
'BUILD HOTSPOT'  87  1  0  'C'
1  1
'EB I64 A-B'  'AG'  457880.6  4224727.1  458344.6  4224725.6  970  5.98  0.0  13.41
1  1
'EB I64 B-C'  'AG'  458344.6  4224725.6  458747.0  4224723.8  690  5.98  0.0  13.41
1  1
'EB I64 C-D'  'BR'  458747.0  4224723.8  458899.8  4224723.3  820  5.98  6.1  13.41
1  1
'EB I64 D-E'  'AG'  458899.8  4224723.3  459336.3  4224721.7  700  5.98  0.0  13.41
1  1
'EB I64 E-F'  'AG'  459336.3  4224721.7  459811.3  4224720.5  1010  5.98  0.0  13.41
1  1
'WB I64 A-B'  'AG'  459807.0  4224747.7  459357.4  4224751.3  850  5.98  0.0  13.41
1  1
'WB I64 B-C'  'AG'  459357.4  4224751.3  458966.2  4224751.4  780  5.98  0.0  13.41
1  1
'WB I64 C-D'  'BR'  458966.2  4224751.4  458793.0  4224751.4  960  5.98  6.1  13.41
1  1
'WB I64 D-E'  'AG'  458793.0  4224751.4  458363.0  4224753.3  720  5.98  0.0  13.41
1  1
'WB I64 E-F'  'AG'  458363.0  4224753.3  457883.0  4224755.2  800  5.98  0.0  13.41
1  1
'SB SR57 A-B'  'AG'  459102.0  4225366.1  459006.8  4225173.9  2080  5.98  0.0  13.41
1  1
'SB SR57 B-C'  'AG'  459006.8  4225173.9  458960.5  4225053.3  2080  5.98  0.0  13.41
1  1
'SB SR57 C-D'  'AG'  458960.5  4225053.3  458919.2  4224944.4  2080  5.98  0.0  13.41
1  1
'SB SR57 D-SB I164 A'  'AG'  458919.2  4224944.4  458863.5  4224798.1  1960  5.98  0.0  13.41
1  1
'SB I164 A-B'  'AG'  458863.5  4224798.1  458792.8  4224619.0  2200  5.98  0.0  13.41
1  1
'SB I164 B-C'  'AG'  458792.8  4224619.0  458678.3  4224342.9  2070  5.98  0.0  13.41
1  1
'SB I164 C-D'  'AG'  458678.3  4224342.9  458648.6  4224244.1  2350  5.98  0.0  13.41
1  1
'NB I164 A-B'  'AG'  458687.8  4224258.1  458719.3  4224370.9  2490  5.98  0.0  13.41
1  1
'NB I164 B-C'  'AG'  458719.3  4224370.9  458831.1  4224673.2  2490  5.98  0.0  13.41
1  1
'NB I164 C-D'  'AG'  458831.1  4224673.2  458903.7  4224860.2  2610  5.98  0.0  13.41
1  1
'NB I164 D-NB SR57 A'  'AG'  458903.7  4224860.2  458942.1  4224960.0  2430  5.98  0.0  13.41
1  1
'NB SR57 A-B'  'AG'  458942.1  4224960.0  458978.3  4225054.0  2500  5.98  0.0  13.41
1  1
'NB SR57 B-C'  'AG'  458978.3  4225054.0  459069.7  4225277.0  2500  5.98  0.0  13.41
1  1
'NB SR57 C-D'  'AG'  459069.7  4225277.0  459102.0  4225366.1  2500  5.98  0.0  13.41
1  1
'NB SR57 A-N-W RAMP A'  'AG'  458903.7  4224860.2  458939.4  4224898.4  180  5.98  0.0  9.75
1  1
'N-W RAMP A-B'  'AG'  458939.4  4224898.4  458980.5  4224914.9  180  5.98  0.0  9.75
1  1
'N-W RAMP B-C'  'AG'  458980.5  4224914.9  459023.5  4224905.4  180  5.98  0.0  9.75
1  1
'N-W RAMP C-D'  'AG'  459023.5  4224905.4  459053.8  4224877.0  180  5.98  0.0  9.75
1  1
'N-W RAMP D-E'  'AG'  459053.8  4224877.0  459065.8  4224836.5  180  5.98  0.0  9.75
1  1
'N-W RAMP E-F'  'AG'  459065.8  4224836.5  459057.6  4224797.9  180  5.98  0.0  9.75
1  1
'N-W RAMP F-G'  'AG'  459057.6  4224797.9  459027.8  4224767.6  180  5.98  0.0  9.75
1  1
'N-W RAMP G-WB I64 C'  'AG'  459027.8  4224767.6  458966.2  4224751.4  180  5.98  0.0  9.75
1  1
'SB I164 B-S-E RAMP A'  'AG'  458792.8  4224619.0  458754.8  4224575.3  130  5.98  0.0  9.75
1  1
'S-E RAMP A-B'  'AG'  458754.8  4224575.3  458711.8  4224560.2  130  5.98  0.0  9.75
1  1
'S-E RAMP B-C'  'AG'  458711.8  4224560.2  458666.9  4224572.2  130  5.98  0.0  9.75
1  1
'S-E RAMP C-D'  'AG'  458666.9  4224572.2  458636.6  4224606.4  130  5.98  0.0  9.75
```

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1  1
'S-E RAMP D-E'  'AG'  458636.6  4224606.4  458630.9  4224647.4  130  5.98  0.0  9.75
1  1
'S-E RAMP E-F'  'AG'  458630.9  4224647.4  458644.1  4224686.6  130  5.98  0.0  9.75
1  1
'S-E RAMP F-G'  'AG'  458644.1  4224686.6  458677.7  4224713.2  130  5.98  0.0  9.75
1  1
'S-E RAMP G-EB 164 C'  'AG'  458677.7  4224713.2  458747.0  4224723.8  130  5.98  0.0  9.75
1  1
'WB I64 D-W-S RAMP A'  'AG'  458793.0  4224751.4  458734.6  4224774.5  240  5.98  0.0  9.75
1  1
'W-S RAMP A-B'  'AG'  458734.6  4224774.5  458708.6  4224815.6  240  5.98  0.0  9.75
1  1
'W-S RAMP B-C'  'AG'  458708.6  4224815.6  458709.9  4224860.5  240  5.98  0.0  9.75
1  1
'W-S RAMP C-D'  'AG'  458709.9  4224860.5  458734.6  4224896.5  240  5.98  0.0  9.75
1  1
'W-S RAMP D-E'  'AG'  458734.6  4224896.5  458771.2  4224913.6  240  5.98  0.0  9.75
1  1
'W-S RAMP E-F'  'AG'  458771.2  4224913.6  458814.2  4224911.0  240  5.98  0.0  9.75
1  1
'W-S RAMP F-G'  'AG'  458814.2  4224911.0  458852.8  4224878.8  240  5.98  0.0  9.75
1  1
'W-S RAMP G-H'  'AG'  458852.8  4224878.8  458865.5  4224837.1  240  5.98  0.0  9.75
1  1
'W-S RAMP H-SB I164 A'  'AG'  458865.5  4224837.1  458863.5  4224798.1  240  5.98  0.0  9.75
1  1
'EB I64 D-E-N RAMP A'  'AG'  458899.8  4224723.3  458952.6  4224706.8  120  5.98  0.0  9.75
1  1
'E-N RAMP A-B'  'AG'  458952.6  4224706.8  458983.0  4224670.8  120  5.98  0.0  9.75
1  1
'E-N RAMP B-C'  'AG'  458983.0  4224670.8  458986.2  4224621.4  120  5.98  0.0  9.75
1  1
'E-N RAMP C-D'  'AG'  458986.2  4224621.4  458963.4  4224579.8  120  5.98  0.0  9.75
1  1
'E-N RAMP D-E'  'AG'  458963.4  4224579.8  458926.1  4224560.8  120  5.98  0.0  9.75
1  1
'E-N RAMP E-F'  'AG'  458926.1  4224560.8  458883.1  4224564.6  120  5.98  0.0  9.75
1  1
'E-N RAMP F-G'  'AG'  458883.1  4224564.6  458846.5  4224588.6  120  5.98  0.0  9.75
1  1
'E-N RAMP G-H'  'AG'  458846.5  4224588.6  458830.6  4224630.3  120  5.98  0.0  9.75
1  1
'E-N RAMP H-NB I164 C'  'AG'  458830.6  4224630.3  458831.1  4224673.2  120  5.98  0.0  9.75
1  1
'NB I164 A-N-E RAMP A'  'AG'  458687.8  4224258.1  458737.7  4224376.2  310  5.98  0.0  9.75
1  1
'N-E RAMP A-B'  'AG'  458737.7  4224376.2  458765.5  4224414.1  310  5.98  0.0  9.75
1  1
'N-E RAMP B-C'  'AG'  458765.5  4224414.1  458815.4  4224455.2  310  5.98  0.0  9.75
1  1
'N-E RAMP C-D'  'AG'  458815.4  4224455.2  459125.8  4224682.8  310  5.98  0.0  9.75
1  1
'N-E RAMP D-E'  'AG'  459125.8  4224682.8  459180.2  4224707.5  310  5.98  0.0  9.75
1  1
'N-E RAMP E-F'  'AG'  459180.2  4224707.5  459227.6  4224716.3  310  5.98  0.0  9.75
1  1
'N-E RAMP F-EB I64 E'  'AG'  459227.6  4224716.3  459336.3  4224721.7  310  5.98  0.0  9.75
1  1
'SB SR57 D-S-W RAMP A'  'AG'  458919.2  4224944.4  458886.9  4224914.2  120  5.98  0.0  9.75
1  1
'S-W RAMP A-B'  'AG'  458886.9  4224914.2  458860.4  4224909.2  120  5.98  0.0  9.75
1  1
'S-W RAMP B-C'  'AG'  458860.4  4224909.2  458797.8  4224930.0  120  5.98  0.0  9.75
1  1
'S-W RAMP C-D'  'AG'  458797.8  4224930.0  458757.3  4224926.9  120  5.98  0.0  9.75
1  1
'S-W RAMP D-E'  'AG'  458757.3  4224926.9  458718.8  4224902.9  120  5.98  0.0  9.75
1  1
'S-W RAMP E-F'  'AG'  458718.8  4224902.9  458621.4  4224803.6  120  5.98  0.0  9.75
1  1
'S-W RAMP F-G'  'AG'  458621.4  4224803.6  458567.0  4224773.3  120  5.98  0.0  9.75
1  1
'S-W RAMP G-H'  'AG'  458567.0  4224773.3  458520.2  4224761.9  120  5.98  0.0  9.75
1  1
'S-W RAMP H-WB I64 E'  'AG'  458520.2  4224761.9  458363.0  4224753.3  120  5.98  0.0  9.75
1  1
'WB I64 B-W-N RAMP A'  'AG'  459357.4  4224751.3  459221.3  4224766.3  70  5.98  0.0  9.75
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```
1  1
'W-N RAMP A-B'  'AG'  459221.3  4224766.3  459165.1  4224786.5  70  5.98  0.0  9.75
1  1
'W-N RAMP B-C'  'AG'  459165.1  4224786.5  459122.7  4224818.7  70  5.98  0.0  9.75
1  1
'W-N RAMP C-D'  'AG'  459122.7  4224818.7  459043.1  4224912.3  70  5.98  0.0  9.75
1  1
'W-N RAMP D-E'  'AG'  459043.1  4224912.3  458995.0  4224933.8  70  5.98  0.0  9.75
1  1
'W-N RAMP E-NB SR57 A'  'AG'  458995.0  4224933.8  458942.1  4224960.0  70  5.98  0.0  9.75
1  1
'EB I64 B-E-S RAMP A'  'AG'  458344.6  4224725.6  458481.1  4224707.5  280  5.98  0.0  9.75
1  1
'E-S RAMP A-B'  'AG'  458481.1  4224707.5  458548.1  4224678.4  280  5.98  0.0  9.75
1  1
'E-S RAMP B-C'  'AG'  458548.1  4224678.4  458598.0  4224631.6  280  5.98  0.0  9.75
1  1
'E-S RAMP C-D'  'AG'  458598.0  4224631.6  458664.4  4224548.1  280  5.98  0.0  9.75
1  1
'E-S RAMP D-E'  'AG'  458664.4  4224548.1  458687.2  4224491.9  280  5.98  0.0  9.75
1  1
'E-S RAMP E-F'  'AG'  458687.2  4224491.9  458692.8  4224416.6  280  5.98  0.0  9.75
1  1
'E-S RAMP F-SB I164 C'  'AG'  458692.8  4224416.6  458678.3  4224342.9  280  5.98  0.0  9.75
1.0  0  4  1000.0  2.0  'Y'  10  0  35
```

CAL3QHC - (DATED 95221)

CAL3QHC PC (32 BIT) VERSION 3.0.0
(C) COPYRIGHT 1993-2000, TRINITY CONSULTANTS

Run Began on 7/14/2005 at 17:54:13

JOB: I-69 SECTION 1 RUN: BUILD HOTSPOT

DATE : 07/14/ 0
TIME : 17:54:13

The MODE flag has been set to C for calculating CO averages.

SITE & METEOROLOGICAL VARIABLES

VS = 0.0 CM/S VD = 0.0 CM/S Z0 = 108. CM
U = 1.0 M/S CLAS = 4 (D) ATIM = 60. MINUTES MIXH = 1000. M AMB = 2.0 PPM

LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (M) X1	Y1	X2	Y2	LENGTH (M)	BRG (DEG)	TYPE	VPH	EF (G/MI)	H (M)	W (M)	V/C	QUEUE (VEH)
1. EB I64 A-B	457880.6	********	458344.6	********	464.	90.	AG	970.	6.0	0.0	13.4		
2. EB I64 B-C	458344.6	********	458747.0	********	402.	90.	AG	690.	6.0	0.0	13.4		
3. EB I64 C-D	458747.0	********	458899.8	********	153.	90.	BR	820.	6.0	6.1	13.4		
4. EB I64 D-E	458899.8	********	459336.3	********	437.	90.	AG	700.	6.0	0.0	13.4		
5. EB I64 E-F	459336.3	********	459811.3	********	475.	90.	AG	1010.	6.0	0.0	13.4		
6. WB I64 A-B	459807.0	********	459357.4	********	450.	271.	AG	850.	6.0	0.0	13.4		
7. WB I64 B-C	459357.4	********	458966.2	********	391.	270.	AG	780.	6.0	0.0	13.4		
8. WB I64 C-D	458966.2	********	458793.0	********	173.	270.	BR	960.	6.0	6.1	13.4		
9. WB I64 D-E	458793.0	********	458363.0	********	430.	270.	AG	720.	6.0	0.0	13.4		
10. WB I64 E-F	458363.0	********	457883.0	********	480.	270.	AG	800.	6.0	0.0	13.4		
11. SB SR57 A-B	459102.0	********	459006.8	********	214.	206.	AG	2080.	6.0	0.0	13.4		
12. SB SR57 B-C	459006.8	********	458960.5	********	129.	201.	AG	2080.	6.0	0.0	13.4		
13. SB SR57 C-D	458960.5	********	458919.2	********	117.	201.	AG	2080.	6.0	0.0	13.4		
14. SB SR57 D-SB I164 A	458919.2	********	458863.5	********	157.	201.	AG	1960.	6.0	0.0	13.4		
15. SB I164 A-B	458863.5	********	458792.8	********	192.	202.	AG	2200.	6.0	0.0	13.4		
16. SB I164 B-C	458792.8	********	458678.3	********	299.	203.	AG	2070.	6.0	0.0	13.4		
17. SB I164 C-D	458678.3	********	458648.6	********	103.	197.	AG	2350.	6.0	0.0	13.4		
18. NB I164 A-B	458687.8	********	458719.3	********	117.	16.	AG	2490.	6.0	0.0	13.4		
19. NB I164 B-C	458719.3	********	458831.1	********	322.	20.	AG	2490.	6.0	0.0	13.4		
20. NB I164 C-D	458831.1	********	458903.7	********	201.	21.	AG	2610.	6.0	0.0	13.4		
21. NB I164 D-NB SR57 A	458903.7	********	458942.1	********	107.	21.	AG	2430.	6.0	0.0	13.4		
22. NB SR57 A-B	458942.1	********	458978.3	********	101.	21.	AG	2500.	6.0	0.0	13.4		
23. NB SR57 B-C	458978.3	********	459069.7	********	241.	22.	AG	2500.	6.0	0.0	13.4		
24. NB SR57 C-D	459069.7	********	459102.0	********	95.	20.	AG	2500.	6.0	0.0	13.4		
25. NB SR57 A-N-W RAMP A	458903.7	********	458939.4	********	53.	43.	AG	180.	6.0	0.0	9.8		
26. N-W RAMP A-B	458939.4	********	458980.5	********	44.	68.	AG	180.	6.0	0.0	9.8		
27. N-W RAMP B-C	458980.5	********	459023.5	********	44.	102.	AG	180.	6.0	0.0	9.8		
28. N-W RAMP C-D	459023.5	********	459053.8	********	42.	133.	AG	180.	6.0	0.0	9.8		
29. N-W RAMP D-E	459053.8	********	459065.8	********	42.	163.	AG	180.	6.0	0.0	9.8		
30. N-W RAMP E-F	459065.8	********	459057.6	********	39.	192.	AG	180.	6.0	0.0	9.8		
31. N-W RAMP F-G	459057.6	********	459027.8	********	43.	224.	AG	180.	6.0	0.0	9.8		
32. N-W RAMP G-WB I64 C	459027.8	********	458966.2	********	64.	255.	AG	180.	6.0	0.0	9.8		
33. SB I164 B-S-E RAMP A	458792.8	********	458754.8	********	58.	221.	AG	130.	6.0	0.0	9.8		
34. S-E RAMP A-B	458754.8	********	458711.8	********	46.	250.	AG	130.	6.0	0.0	9.8		
35. S-E RAMP B-C	458711.8	********	458666.9	********	46.	285.	AG	130.	6.0	0.0	9.8		

JOB: I-69 SECTION 1 RUN: BUILD HOTSPOT

DATE : 07/14/ 0
TIME : 17:54:13

LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (M) X1	Y1	X2	Y2	LENGTH (M)	BRG (DEG)	TYPE	VPH	EF (G/MI)	H (M)	W (M)	V/C	QUEUE (VEH)
36. S-E RAMP C-D	458666.9	********	458636.6	********	46.	319.	AG	130.	6.0	0.0	9.8		
37. S-E RAMP D-E	458636.6	********	458630.9	********	41.	352.	AG	130.	6.0	0.0	9.8		
38. S-E RAMP E-F	458630.9	********	458644.1	********	41.	19.	AG	130.	6.0	0.0	9.8		
39. S-E RAMP F-G	458644.1	********	458677.7	********	43.	52.	AG	130.	6.0	0.0	9.8		
40. S-E RAMP G-EB 164 C	458677.7	********	458747.0	********	70.	81.	AG	130.	6.0	0.0	9.8		
41. WB I64 D-W-S RAMP A	458793.0	********	458734.6	********	63.	291.	AG	240.	6.0	0.0	9.8		
42. W-S RAMP A-B	458734.6	********	458708.6	********	49.	328.	AG	240.	6.0	0.0	9.8		
43. W-S RAMP B-C	458708.6	********	458709.9	********	45.	2.	AG	240.	6.0	0.0	9.8		
44. W-S RAMP C-D	458709.9	********	458734.6	********	44.	34.	AG	240.	6.0	0.0	9.8		
45. W-S RAMP D-E	458734.6	********	458771.2	********	40.	65.	AG	240.	6.0	0.0	9.8		
46. W-S RAMP E-F	458771.2	********	458814.2	********	43.	93.	AG	240.	6.0	0.0	9.8		
47. W-S RAMP F-G	458814.2	********	458852.8	********	50.	130.	AG	240.	6.0	0.0	9.8		
48. W-S RAMP G-H	458852.8	********	458865.5	********	44.	163.	AG	240.	6.0	0.0	9.8		
49. W-S RAMP H-SB I164 A	458865.5	********	458863.5	********	39.	183.	AG	240.	6.0	0.0	9.8		
50. EB I64 D-E-N RAMP A	458899.8	********	458952.6	********	55.	107.	AG	120.	6.0	0.0	9.8		
51. E-N RAMP A-B	458952.6	********	458983.0	********	47.	140.	AG	120.	6.0	0.0	9.8		
52. E-N RAMP B-C	458983.0	********	458986.2	********	50.	176.	AG	120.	6.0	0.0	9.8		
53. E-N RAMP C-D	458986.2	********	458963.4	********	47.	209.	AG	120.	6.0	0.0	9.8		
54. E-N RAMP D-E	458963.4	********	458926.1	********	42.	243.	AG	120.	6.0	0.0	9.8		
55. E-N RAMP E-F	458926.1	********	458883.1	********	43.	275.	AG	120.	6.0	0.0	9.8		
56. E-N RAMP F-G	458883.1	********	458846.5	********	44.	303.	AG	120.	6.0	0.0	9.8		
57. E-N RAMP G-H	458846.5	********	458830.6	********	45.	339.	AG	120.	6.0	0.0	9.8		
58. E-N RAMP H-NB I164 C	458830.6	********	458831.1	********	43.	1.	AG	120.	6.0	0.0	9.8		
59. NB I164 A-N-E RAMP A	458687.8	********	458737.7	********	128.	23.	AG	310.	6.0	0.0	9.8		
60. N-E RAMP A-B	458737.7	********	458765.5	********	47.	36.	AG	310.	6.0	0.0	9.8		
61. N-E RAMP B-C	458765.5	********	458815.4	********	65.	51.	AG	310.	6.0	0.0	9.8		
62. N-E RAMP C-D	458815.4	********	459125.8	********	385.	54.	AG	310.	6.0	0.0	9.8		
63. N-E RAMP D-E	459125.8	********	459180.2	********	60.	66.	AG	310.	6.0	0.0	9.8		
64. N-E RAMP E-F	459180.2	********	459227.6	********	48.	79.	AG	310.	6.0	0.0	9.8		
65. N-E RAMP F-EB I64 E	459227.6	********	459336.3	********	109.	87.	AG	310.	6.0	0.0	9.8		
66. SB SR57 D-S-W RAMP A	458919.2	********	458886.9	********	44.	227.	AG	120.	6.0	0.0	9.8		
67. S-W RAMP A-B	458886.9	********	458860.4	********	27.	259.	AG	120.	6.0	0.0	9.8		
68. S-W RAMP B-C	458860.4	********	458797.8	********	66.	289.	AG	120.	6.0	0.0	9.8		
69. S-W RAMP C-D	458797.8	********	458757.3	********	41.	266.	AG	120.	6.0	0.0	9.8		
70. S-W RAMP D-E	458757.3	********	458718.8	********	45.	238.	AG	120.	6.0	0.0	9.8		
71. S-W RAMP E-F	458718.8	********	458621.4	********	139.	224.	AG	120.	6.0	0.0	9.8		
72. S-W RAMP F-G	458621.4	********	458567.0	********	62.	241.	AG	120.	6.0	0.0	9.8		
73. S-W RAMP G-H	458567.0	********	458520.2	********	48.	256.	AG	120.	6.0	0.0	9.8		
74. S-W RAMP H-WB I64 E	458520.2	********	458363.0	********	157.	267.	AG	120.	6.0	0.0	9.8		
75. WB I64 B-W-N RAMP A	459357.4	********	459221.3	********	137.	276.	AG	70.	6.0	0.0	9.8		
76. W-N RAMP A-B	459221.3	********	459165.1	********	60.	290.	AG	70.	6.0	0.0	9.8		
77. W-N RAMP B-C	459165.1	********	459122.7	********	53.	307.	AG	70.	6.0	0.0	9.8		
78. W-N RAMP C-D	459122.7	********	459043.1	********	123.	320.	AG	70.	6.0	0.0	9.8		
79. W-N RAMP D-E	459043.1	********	458995.0	********	53.	294.	AG	70.	6.0	0.0	9.8		
80. W-N RAMP E-NB SR57 A	458995.0	********	458942.1	********	59.	296.	AG	70.	6.0	0.0	9.8		
81. EB I64 B-E-S RAMP A	458344.6	********	458481.1	********	138.	98.	AG	280.	6.0	0.0	9.8		
82. E-S RAMP A-B	458481.1	********	458548.1	********	73.	113.	AG	280.	6.0	0.0	9.8		
83. E-S RAMP B-C	458548.1	********	458598.0	********	69.	133.	AG	280.	6.0	0.0	9.8		

JOB: I-69 SECTION 1 RUN: BUILD HOTSPOT

DATE : 07/14/ 0
TIME : 17:54:13

LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (M) X1	Y1	X2	Y2	LENGTH (M)	BRG (DEG)	TYPE	VPH	EF (G/MI)	H (M)	W (M)	V/C	QUEUE (VEH)
84. E-S RAMP C-D	458598.0	********	458664.4	********	107.	142.	AG	280.	6.0	0.0	9.8		
85. E-S RAMP D-E	458664.4	********	458687.2	********	60.	158.	AG	280.	6.0	0.0	9.8		
86. E-S RAMP E-F	458687.2	********	458692.8	********	76.	176.	AG	280.	6.0	0.0	9.8		
87. E-S RAMP F-SB I164 C	458692.8	********	458678.3	********	75.	191.	AG	280.	6.0	0.0	9.8		

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE

RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (M) X	Y	Z
1. EXIST. HOTSPOT - 10	458722.7	********	1.8
2. EXIST. HOTSPOT - 50	458734.3	********	1.8
3. EXIST. HOTSPOT - 100	458748.7	********	1.8
4. EXIST. HOTSPOT - 150	458763.3	********	1.8

JOB: I-69 SECTION 1 RUN: BUILD HOTSPOT

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-350.

WIND ANGLE (DEGR)	CONCENTRATION (PPM) REC1	REC2	REC3	REC4
0.	2.7	2.3	2.3	2.3
10.	2.6	2.3	2.3	2.1
20.	2.3	2.1	2.1	2.0
30.	2.1	2.0	2.0	2.0
40.	2.0	2.0	2.0	2.0
50.	2.0	2.0	2.0	2.0
60.	2.0	2.0	2.0	2.0
70.	2.0	2.0	2.0	2.0
80.	2.0	2.0	2.0	2.0
90.	2.0	2.0	2.0	2.0
100.	2.0	2.0	2.0	2.0
110.	2.0	2.0	2.0	2.0
120.	2.0	2.0	2.0	2.0
130.	2.0	2.0	2.0	2.0
140.	2.0	2.0	2.0	2.0
150.	2.0	2.0	2.0	2.0
160.	2.0	2.0	2.0	2.0
170.	2.0	2.0	2.0	2.0
180.	2.0	2.0	2.0	2.0
190.	2.0	2.0	2.0	2.0
200.	2.1	2.0	2.0	2.0
210.	2.4	2.1	2.0	2.0
220.	2.5	2.2	2.1	2.0
230.	2.6	2.3	2.1	2.0
240.	2.5	2.3	2.3	2.1
250.	2.5	2.3	2.3	2.2
260.	2.5	2.3	2.3	2.2
270.	2.5	2.3	2.3	2.2
280.	2.5	2.3	2.3	2.2
290.	2.5	2.3	2.3	2.2
300.	2.6	2.3	2.3	2.2
310.	2.5	2.3	2.3	2.2
320.	2.5	2.3	2.3	2.2
330.	2.5	2.3	2.3	2.3
340.	2.5	2.4	2.3	2.2
350.	2.6	2.4	2.3	2.3
MAX	2.7	2.4	2.3	2.3
DEGR.	0	340	350	350

THE HIGHEST CONCENTRATION OF 2.70 PPM OCCURRED AT RECEPTOR REC1 .

Interagency Consultation – Ozone Conformity Process for Greene County

Meeting Summary

March, 1, 2007

Attendees:

INDOT: Dan Buck, Roy Nunnally, Geraldine Lampley, Frank Baukert, et.al.
IDEM: Scott Deloney, Steve Seals,
EPA: Pat Morris
FHWA: Larry Heil
BLA: Dean Munn

Meeting Summary:

Background - Greene County was designated as a basic non-attainment area for the 8 hour ozone standard in April 2004. Greene County was subsequently re-designated as a maintenance area in November 2005. An approved SIP with budgets for mobile source emissions of VOC and NOx is in place. The conformity process is being initiated because of the imminent release of I-69 Tier 2 draft EIS's for sections 3 and 4.

Mobile 6.2 input assumptions – This project will use identical assumptions as were used by IDEM for SIP development for Greene County in 2005. Mobile 6.2 details are attached.

Analysis Years - The years 2010, 2015, 2025, and 2035 will be analyzed. EPA says that all years must be modeled, with no interpolation of VMT allowed. BLA will be required to develop land use scenarios, other model inputs (trucking and external travel), network scenarios, and model runs representing each of the analysis years.

I-69 construction termini and open to traffic dates are not finalized. INDOT will provide details prior to model network coding and analysis.

I-69 Henderson to Evansville project (new Ohio River bridge) will not be included in the conformity modeling for Greene County.

Supplemental Items -

Supplemental discussion was also included on the agenda regarding the need for PM 2.5 hotspot analysis for the I-69 Sections 1 and 2 EIS's.

The Section 2 I-69 Tier 2 EIS study corridor passes through Pike County. Washington Township in Pike County is part of the Evansville PM 2.5 Non-

Attainment Area, so it is necessary to decide whether or not the project is of air quality concern for PM 2.5 which would trigger a qualitative hot spot analysis. Traffic modeling forecasts comparing build and no build scenarios for the I-69 project were provided to the group and the group consensus was that the project did not generate sufficient traffic to warrant a qualitative analysis. The Interagency Consultation Group concurred that the Washington Township of Pike County portion of the I-69 project is not of air quality concern.

The Section 1 I-69 Tier 2 EIS study corridor passes through Gibson County, a portion of which (Montgomery Township) is part of the Evansville PM 2.5 Non-Attainment Area. The I-69 project does not pass through or near Montgomery Township. Also, the project study area abuts with, but does not go into, Vanderburgh County, so it is necessary to decide whether or not the project is of air quality concern for PM 2.5 which would trigger a qualitative hot spot analysis. Traffic modeling forecasts comparing build and no build scenarios for the I-69 project were provided to the group showed that the build scenario has more than 10,000 truck trips per day in Vanderburgh County. This area is outside the I-69 study corridor, but within the area being modeled. Since, the forecasted heavy truck traffic is not occurring directly in the I-69 study area the issue remained unresolved as to whether the project is of air quality concern or not. FHWA and EPA plan to get clarification from OTAQ and HQ and report back to the group in a subsequent conference call.

Interagency Consultation – Ozone Conformity Process for Greene County

Meeting Summary
June 14, 2007

Attendees:

INDOT: Dan Buck, Roy Nunnally, Steve Smith, Laurence Brown
IDEM: Shawn Seals, Brian Callahan
EPA: Pat Morris
FHWA: Tony DeSimone
BLA: Dean Munn

Meeting Summary:

Background - Greene County was designated as a basic non-attainment area for the 8 hour ozone standard in April 2004. Greene County was subsequently re-designated as a maintenance area in November 2005. An approved SIP with budgets for mobile source emissions of VOC and NOx is in place. The conformity process is being conducted because of the imminent release of I-69 Tier 2 EIS's for sections 3 and 4.

The contents of the draft Greene County Ozone Conformity document were reviewed and summarized as follows:

Mobile 6.2 input assumptions – This project had identical assumptions as were used by IDEM for SIP development for Greene County in 2005.

Analysis Years - The years 2010, 2015, 2025, and 2035 were directly modeled, per the EPA feedback received at the initial March 1 consultation meeting. BLA developed land use scenarios, other model inputs (trucking and external travel), network scenarios, and model runs representing each of the analysis years.

The I-69 Henderson to Evansville project (new Ohio River bridge) was not included in the conformity modeling for Greene County because of the fiscal constraint requirement. The model networks were also reconciled to be consistent with the project list and project timing from INDOT's Major Moves and updated long range plan.

The analysis showed that emissions for both VOC and NOx will be below the SIP budgets for the years 2015, 2025 and 2035.

EPA commented that they would like to see the Greene County Conformity document Table 7 which show the emission analysis results to also include the VOC and NOX budgets. EPA would also like to include some qualitative

discussion of how the emissions are declining from 2002 through the 2015 Attainment year.

IDEM commented that they would like to see more VMT trend data from the past. BLA agreed to modify Figure 1 to show historical HPMS data back to the 1990's. BLA, IDEM and INDOT will collaborate to obtain the historical data and will decide the precise beginning year. The final Greene County Conformity document will contain the revised Figure 1.

Supplemental Item -

Supplemental discussion was also included on the agenda regarding the need for PM 2.5 hotspot analysis for the I-69 Sections 1 and 2 EIS's. After the March 1 meeting, FHWA and EPA sought clarification from OTAQ and FHWA Headquarters and reported their findings back to the group on June 14. The conclusion was that EPA and FHWA would not require a qualitative PM 2.5 hotspot analysis for the I-69 EIS because the project falls outside the County and Township Non-Attainment areas. Also, the project has already been analyzed for the Evansville MPO PM2.5 Conformity and has successfully met the conformity test there. The Interagency Consultation Group agreed that the project should then be designated as "not of air quality concern" for PM 2.5 hotspot analysis.