## Table A-1
## Town of Lena: No-Action Alternative CO Concentration Calculations.

**CO Background Concentrations**

| | |
|---|---|
| 1-hour background CO | 2.9 ppm |
| 8-hour background CO | 2.0 ppm |
| 8-hour persistence factor | 0.7 |

## No-Action Modeling Results Peak Traffic Period.

| | 2002 No-Action | | | 2010 No-Action | | | 2020 No-Action | | |
|---|---|---|---|---|---|---|---|---|---|
| Receptor | modeled | 1-hr w/bg | 8-hr w/bg | modeled | 1-hr w/bg | 8-hr w/bg | modeled | 1-hr w/bg | 8-hr w/bg |
| R1 | 0.0 | 2.9 | 2.0 | 0.2 | 3.1 | 2.1 | 0.2 | 3.1 | 2.1 |
| R2 | 0.0 | 2.9 | 2.0 | 0.0 | 2.9 | 2.0 | 0.2 | 3.1 | 2.1 |
| R3 | 0.0 | 2.9 | 2.0 | 0.2 | 3.1 | 2.1 | 0.2 | 3.1 | 2.1 |
| R4 | 0.2 | 3.1 | 2.1 | 0.2 | 3.1 | 2.1 | 0.2 | 3.1 | 2.1 |
| R5 | 0.2 | 3.1 | 2.1 | 0.2 | 3.1 | 2.1 | 0.4 | 3.3 | 2.3 |
| R6 | 0.2 | 3.1 | 2.1 | 0.2 | 3.1 | 2.1 | 0.4 | 3.3 | 2.3 |
| R7 | 0.2 | 3.1 | 2.1 | 0.2 | 3.1 | 2.1 | 0.4 | 3.3 | 2.3 |
| R8 | 0.2 | 3.1 | 2.1 | 0.2 | 3.1 | 2.1 | 0.4 | 3.3 | 2.3 |
| R9 | 0.2 | 3.1 | 2.1 | 0.2 | 3.1 | 2.1 | 0.4 | 3.3 | 2.3 |
| R10 | 0.4 | 3.3 | 2.3 | 0.6 | 3.5 | 2.4 | 0.6 | 3.5 | 2.4 |
| R11 | 1.3 | 4.2 | 2.9 | 1.5 | 4.4 | 3.1 | 1.9 | 4.8 | 3.3 |
| R12 | 1.0 | 3.9 | 2.7 | 1.1 | 4.0 | 2.8 | 1.6 | 4.5 | 3.1 |
| R13 | 1.0 | 3.9 | 2.7 | 1.3 | 4.2 | 2.9 | 1.7 | 4.6 | 3.2 |
| R14 | 0.8 | 3.7 | 2.6 | 1.0 | 3.9 | 2.7 | 1.3 | 4.2 | 2.9 |
| **Totals** | | **4.2** | **2.9** | | **4.4** | **3.1** | | **4.8** | **3.3** |

Source: Louis Berger Group, Inc. 2002

# Table A-2
# Town of Lena: Expressway (Alternates 11 and 12) - CO Concentration Calculations.

**CO Background Concentrations**

| | |
|---|---|
| 1-hour background CO | 2.9 ppm |
| 8-hour background CO | 2.0 ppm |
| 8-hour persistence factor | 0.7 |

## Expressway Modeling Results Peak Traffic Period.

| Receptor | 2010 | | | 2020 | | |
|---|---|---|---|---|---|---|
| | modeled | 1-hr w/bg | 8-hr w/bg | modeled | 1-hr w/bg | 8-hr w/bg |
| R1 | 0.0 | 2.9 | 2.0 | 0.0 | 2.9 | 2.0 |
| R2 | 0.0 | 2.9 | 2.0 | 0.0 | 2.9 | 2.0 |
| R3 | 0.0 | 2.9 | 2.0 | 0.0 | 2.9 | 2.0 |
| R4 | 0.0 | 2.9 | 2.0 | 0.0 | 2.9 | 2.0 |
| R5 | 0.0 | 2.9 | 2.0 | 0.1 | 3.0 | 2.1 |
| R6 | 0.0 | 2.9 | 2.0 | 0.2 | 3.1 | 2.1 |
| R7 | 0.2 | 3.1 | 2.1 | 0.2 | 3.1 | 2.1 |
| R8 | 0.2 | 3.1 | 2.1 | 0.2 | 3.1 | 2.1 |
| R9 | 0.2 | 3.1 | 2.1 | 0.2 | 3.1 | 2.1 |
| R10 | 0.3 | 3.2 | 2.2 | 0.3 | 3.2 | 2.2 |
| R11 | 1.2 | 4.1 | 2.8 | 1.5 | 4.4 | 3.1 |
| R12 | 0.9 | 3.8 | 2.6 | 1.2 | 4.1 | 2.8 |
| R13 | 1.0 | 3.9 | 2.7 | 1.1 | 4.0 | 2.8 |
| R14 | 0.5 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| **Totals** | | **4.1** | **2.8** | | **4.4** | **3.1** |

Source: Louis Berger Group, Inc. 2001

## Table A-3
## Town of Lena: Freeway (Alternates 1 Through 10) - CO Concentration Calculations.

**CO Background Concentrations**

| | |
|---|---|
| 1-hour background CO | 2.9 ppm |
| 8-hour background CO | 2.0 ppm |
| 8-hour persistence factor | 0.7 |

## Freeway Modeling Results AM Peak Traffic Period.

| | 2010 | | | 2020 | | |
|---|---|---|---|---|---|---|
| Receptor | modeled | 1-hr w/bg | 8-hr w/bg | modeled | 1-hr w/bg | 8-hr w/bg |
| R1 | 1.0 | 3.9 | 2.7 | 1.4 | 4.3 | 3.0 |
| R2 | 0.5 | 3.4 | 2.4 | 0.8 | 3.7 | 2.6 |
| R3 | 0.7 | 3.6 | 2.5 | 1.0 | 3.9 | 2.7 |
| R4 | 0.4 | 3.3 | 2.3 | 0.4 | 3.3 | 2.3 |
| R5 | 0.3 | 3.2 | 2.2 | 0.7 | 3.6 | 2.5 |
| R6 | 0.4 | 3.3 | 2.3 | 0.4 | 3.3 | 2.3 |
| R7 | 0.8 | 3.7 | 2.6 | 1.1 | 4.0 | 2.8 |
| R8 | 1.0 | 3.9 | 2.7 | 1.4 | 4.3 | 3.0 |
| R9 | 0.2 | 3.1 | 2.1 | 0.4 | 3.3 | 2.3 |
| R10 | 0.2 | 3.1 | 2.1 | 0.4 | 3.3 | 2.3 |
| R11 | 0.0 | 2.9 | 2.0 | 0.0 | 2.9 | 2.0 |
| R12 | 0.0 | 2.9 | 2.0 | 0.0 | 2.9 | 2.0 |
| R13 | 0.0 | 2.9 | 2.0 | 0.0 | 2.9 | 2.0 |
| R14 | 0.0 | 2.9 | 2.0 | 0.0 | 2.9 | 2.0 |
| **Totals** | | **3.9** | **2.7** | | **4.3** | **3.0** |

## Freeway Modeling Results PM Peak Traffic Period.

| | 2010 | | | 2020 | | |
|---|---|---|---|---|---|---|
| Receptor | modeled | 1-hr w/bg | 8-hr w/bg | modeled | 1-hr w/bg | 8-hr w/bg |
| R1 | 0.8 | 3.7 | 2.6 | 1.2 | 4.1 | 2.8 |
| R2 | 0.4 | 3.3 | 2.3 | 0.6 | 3.5 | 2.4 |
| R3 | 0.6 | 3.5 | 2.4 | 0.9 | 3.8 | 2.6 |
| R4 | 0.4 | 3.3 | 2.3 | 0.4 | 3.3 | 2.3 |
| R5 | 0.3 | 3.2 | 2.2 | 0.5 | 3.4 | 2.4 |
| R6 | 0.3 | 3.2 | 2.2 | 0.4 | 3.3 | 2.3 |
| R7 | 0.8 | 3.7 | 2.6 | 1.0 | 3.9 | 2.7 |
| R8 | 1.1 | 4.0 | 2.8 | 1.4 | 4.3 | 3.0 |
| R9 | 0.2 | 3.1 | 2.1 | 0.4 | 3.3 | 2.3 |
| R10 | 0.3 | 3.2 | 2.2 | 0.5 | 3.4 | 2.4 |
| R11 | 0.0 | 2.9 | 2.0 | 0.1 | 3.0 | 2.1 |
| R12 | 0.0 | 2.9 | 2.0 | 0.1 | 3.0 | 2.1 |
| R13 | 0.0 | 2.9 | 2.0 | 0.0 | 2.9 | 2.0 |
| R14 | 0.0 | 2.9 | 2.0 | 0.1 | 3.0 | 2.1 |
| **Totals** | | **4.0** | **2.8** | | **4.3** | **3.0** |

Source: Louis Berger Group, Inc. 2001.

**Table A-4**
**Freeway Alignment (Alternates 1 and 2) - CO Concentration Calculations.**

**CO Background Concentrations**

| | |
|---|---|
| 1-hour background CO | 2.9 ppm |
| 8-hour background CO | 2.0 ppm |
| 8-hour persistence factor | 0.7 |

## Freeway Modeling Results AM Peak Traffic Period.

| Receptor | 2010 | | | 2020 | | |
|---|---|---|---|---|---|---|
| | modeled | 1-hr w/bg | 8-hr w/bg | modeled | 1-hr w/bg | 8-hr w/bg |
| R1 | 0.8 | 3.7 | 1.5 | 1.0 | 3.9 | 1.6 |
| R2 | 0.5 | 3.4 | 2.4 | 0.5 | 3.4 | 2.4 |
| R3 | 0.4 | 3.3 | 2.3 | 0.6 | 3.5 | 2.4 |
| R4 | 0.5 | 3.4 | 2.4 | 0.5 | 3.4 | 2.4 |
| R5 | 0.2 | 3.1 | 2.1 | 0.3 | 3.2 | 2.2 |
| R6 | 0.3 | 3.2 | 2.2 | 0.3 | 3.2 | 2.2 |
| R7 | 0.4 | 3.3 | 2.3 | 0.4 | 3.3 | 2.3 |
| R8 | 0.3 | 3.2 | 2.2 | 0.4 | 3.3 | 2.3 |
| R9 | 0.4 | 3.3 | 2.3 | 0.5 | 3.4 | 2.4 |
| R10 | 0.5 | 3.4 | 2.4 | 0.6 | 3.5 | 2.4 |
| R11 | 0.6 | 3.5 | 2.4 | 0.7 | 3.6 | 2.5 |
| R12 | 0.3 | 3.2 | 2.2 | 0.4 | 3.3 | 2.3 |
| R13 | 0.3 | 3.2 | 2.2 | 0.3 | 3.2 | 2.2 |
| R14 | 0.2 | 3.1 | 2.1 | 0.2 | 3.1 | 2.1 |
| R15 | 0.2 | 3.1 | 2.1 | 0.2 | 3.1 | 2.1 |
| R16 | 0.3 | 3.2 | 2.2 | 0.5 | 3.4 | 2.4 |
| R17 | 0.3 | 3.2 | 2.2 | 0.3 | 3.2 | 2.2 |
| R18 | 0.4 | 3.3 | 2.3 | 0.6 | 3.5 | 2.4 |
| R19 | 0.7 | 3.6 | 2.5 | 0.8 | 3.7 | 2.6 |
| **Totals** | | **3.7** | **2.5** | | **3.9** | **2.6** |

## Freeway Modeling Results PM Peak Traffic Period.

| Receptor | 2010 | | | 2020 | | |
|---|---|---|---|---|---|---|
| | modeled | 1-hr w/bg | 8-hr w/bg | modeled | 1-hr w/bg | 8-hr w/bg |
| R1 | 0.8 | 3.7 | 1.5 | 0.6 | 3.5 | 2.4 |
| R2 | 0.5 | 3.4 | 2.4 | 0.3 | 3.2 | 2.2 |
| R3 | 0.5 | 3.4 | 2.4 | 0.4 | 3.3 | 2.3 |
| R4 | 0.5 | 3.4 | 2.4 | 0.5 | 3.4 | 2.4 |
| R5 | 0.2 | 3.1 | 2.1 | 0.2 | 3.1 | 2.1 |
| R6 | 0.2 | 3.1 | 2.1 | 0.2 | 3.1 | 2.1 |
| R7 | 0.3 | 3.2 | 2.2 | 0.3 | 3.2 | 2.2 |
| R8 | 0.3 | 3.2 | 2.2 | 0.2 | 3.1 | 2.1 |
| R9 | 0.3 | 3.2 | 2.2 | 0.2 | 3.1 | 2.1 |
| R10 | 0.4 | 3.3 | 2.3 | 0.4 | 3.3 | 2.3 |
| R11 | 0.6 | 3.5 | 2.4 | 0.6 | 3.5 | 2.4 |
| R12 | 0.3 | 3.2 | 2.2 | 0.2 | 3.1 | 2.1 |
| R13 | 0.3 | 3.2 | 2.2 | 0.3 | 3.2 | 2.2 |
| R14 | 0.1 | 3.0 | 2.1 | 0.1 | 3.0 | 2.1 |
| R15 | 0.2 | 3.1 | 2.1 | 0.1 | 3.0 | 2.1 |
| R16 | 0.3 | 3.2 | 2.2 | 0.2 | 3.1 | 2.1 |
| R17 | 0.2 | 3.1 | 2.1 | 0.2 | 3.1 | 2.1 |
| R18 | 0.4 | 3.3 | 2.3 | 0.4 | 3.3 | 2.3 |
| R19 | 0.7 | 3.6 | 2.5 | 0.5 | 3.4 | 2.4 |
| **Totals** | | **3.7** | **2.5** | | **3.5** | **2.4** |

Source: Louis Berger Group, Inc. 2001.

## Table A-5
## Freeway Alignment (Alternates 3 Through 10) - CO Concentration Calculations.

**CO Background Concentrations**

| | |
|---|---|
| 1-hour background CO | 2.9 ppm |
| 8-hour background CO | 2.0 ppm |
| 8-hour persistence factor | 0.7 |

### Freeway Modeling Results AM Peak Traffic Period.

| | 2010 Build AM | | | 2020 Build AM | | |
|---|---|---|---|---|---|---|
| Receptor | modeled | 1-hr w/bg | 8-hr w/bg | modeled | 1-hr w/bg | 8-hr w/bg |
| R1 | 0.3 | 3.2 | 2.2 | 0.5 | 3.4 | 2.3 |
| R2 | 0.2 | 3.1 | 2.1 | 0.2 | 3.1 | 2.1 |
| R3 | 0.1 | 3.0 | 2.1 | 0.2 | 3.1 | 2.1 |
| R4 | 0.2 | 3.1 | 2.1 | 0.4 | 3.3 | 2.3 |
| R5 | 0.2 | 3.1 | 2.1 | 0.2 | 3.1 | 2.1 |
| R6 | 0.3 | 3.2 | 2.2 | 0.5 | 3.4 | 2.3 |
| R7 | 0.3 | 3.2 | 2.2 | 0.4 | 3.3 | 2.3 |
| R8 | 0.3 | 3.2 | 2.2 | 0.4 | 3.3 | 2.3 |
| R9 | 0.2 | 3.1 | 2.1 | 0.4 | 3.3 | 2.3 |
| R10 | 0.3 | 3.2 | 2.2 | 0.3 | 3.2 | 2.2 |
| R11 | 0.4 | 3.3 | 2.3 | 0.5 | 3.4 | 2.3 |
| R12 | 0.5 | 3.4 | 2.4 | 0.5 | 3.4 | 2.3 |
| R13 | 0.6 | 3.5 | 2.4 | 0.5 | 3.4 | 2.3 |
| R14 | 0.4 | 3.3 | 2.3 | 0.4 | 3.3 | 2.3 |
| R15 | 0.2 | 3.1 | 2.1 | 0.4 | 3.3 | 2.3 |
| R16 | 0.2 | 3.1 | 2.1 | 0.3 | 3.2 | 2.2 |
| R17 | 0.3 | 3.2 | 2.2 | 0.4 | 3.3 | 2.3 |
| R18 | 0.2 | 3.1 | 2.1 | 0.4 | 3.3 | 2.3 |
| R19 | 0.2 | 3.1 | 2.1 | 0.2 | 3.1 | 2.1 |
| R20 | 0.2 | 3.1 | 2.1 | 0.3 | 3.2 | 2.2 |
| R21 | 0.3 | 3.2 | 2.2 | 0.5 | 3.4 | 2.3 |
| **Totals** | | **3.5** | **2.4** | | **3.4** | **2.3** |

### Freeway Modeling Results PM Peak Traffic Period.

| | 2010 Build PM | | | 2020 Build PM | | |
|---|---|---|---|---|---|---|
| Receptor | modeled | 1-hr w/bg | 8-hr w/bg | modeled | 1-hr w/bg | 8-hr w/bg |
| R1 | 0.3 | 3.2 | 2.2 | 0.5 | 3.4 | 2.3 |
| R2 | 0.2 | 3.1 | 2.1 | 0.3 | 3.2 | 2.2 |
| R3 | 0.1 | 3.0 | 2.1 | 0.1 | 3.0 | 2.1 |
| R4 | 0.2 | 3.1 | 2.1 | 0.3 | 3.2 | 2.2 |
| R5 | 0.1 | 3.0 | 2.1 | 0.2 | 3.1 | 2.1 |
| R6 | 0.4 | 3.3 | 2.3 | 0.5 | 3.4 | 2.3 |
| R7 | 0.3 | 3.2 | 2.2 | 0.3 | 3.2 | 2.2 |
| R8 | 0.3 | 3.2 | 2.2 | 0.3 | 3.2 | 2.2 |
| R9 | 0.1 | 3.0 | 2.1 | 0.3 | 3.2 | 2.2 |
| R10 | 0.2 | 3.1 | 2.1 | 0.3 | 3.2 | 2.2 |
| R11 | 0.3 | 3.2 | 2.2 | 0.4 | 3.3 | 2.3 |
| R12 | 0.4 | 3.3 | 2.3 | 0.5 | 3.4 | 2.3 |
| R13 | 0.5 | 3.4 | 2.3 | 0.5 | 3.4 | 2.3 |
| R14 | 0.3 | 3.2 | 2.2 | 0.4 | 3.3 | 2.3 |
| R15 | 0.2 | 3.1 | 2.1 | 0.4 | 3.3 | 2.3 |
| R16 | 0.2 | 3.1 | 2.1 | 0.3 | 3.2 | 2.2 |
| R17 | 0.3 | 3.2 | 2.2 | 0.5 | 3.4 | 2.3 |
| R18 | 0.4 | 3.3 | 2.3 | 0.5 | 3.4 | 2.3 |
| R19 | 0.1 | 3.0 | 2.1 | 0.2 | 3.1 | 2.1 |
| R20 | 0.2 | 3.1 | 2.1 | 0.3 | 3.2 | 2.2 |
| R21 | 0.3 | 3.2 | 2.2 | 0.5 | 3.4 | 2.3 |
| **Totals** | | **3.4** | **2.3** | | **3.4** | **2.3** |

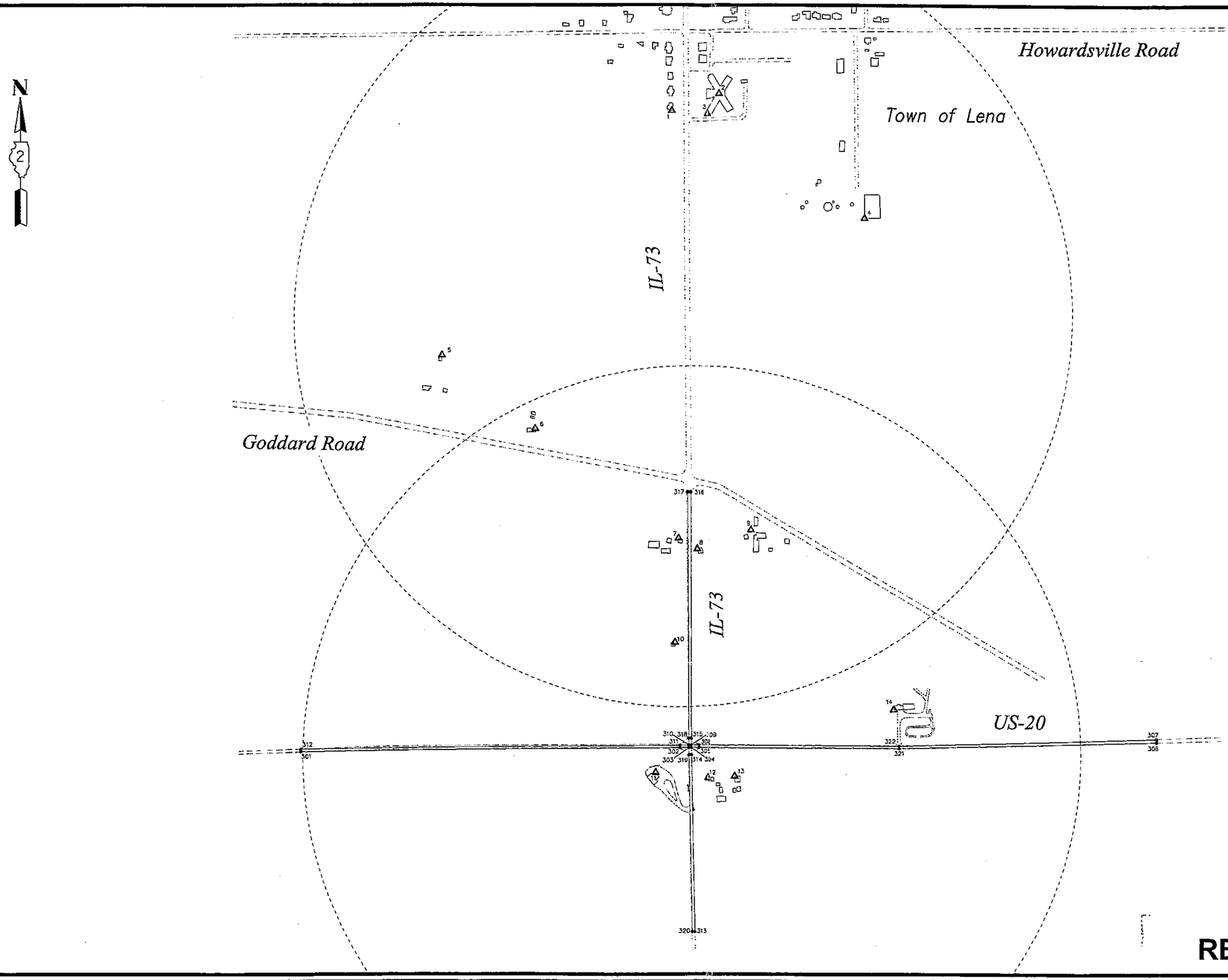
Source: Louis Berger Group, Inc. 2001.

## Table B-1 Summary of MOBILE5a Input Modeling Parameters

| | |
|---|---|
| Registration Distribution: | MOBILE5a Default |
| Vehicle Mix: | MOBILE5a Default |
| Vehicle Operating Mode Phases: | MOBILE5a Default |
| Vehicle Speeds (mph): | Freeway 35; Intersection/Expressway 15 |
| Ambient Temperature: | 21°F |
| Hydrocarbon Emission Composition: | Carbon Monoxide (CO) only |
| Inspection / Maintenance Program: | No Program Modeled |
| Anti-Tampering Program: | No Program Modeled |
| Stage II Vapor Recovery: | No Program Modeled |
| Reformulated Gas: | No Program Modeled |

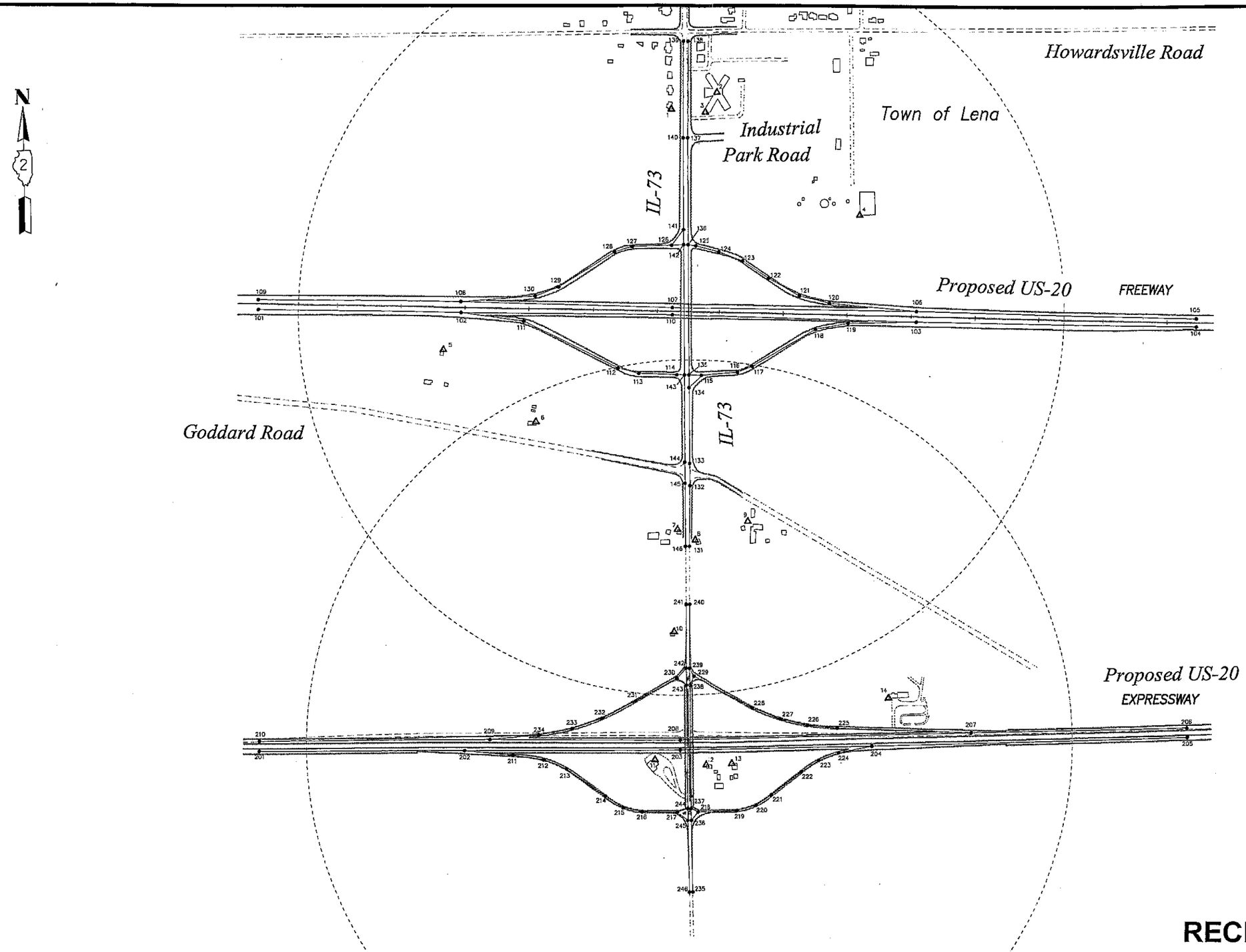
## Table C-1 Summary of CAL3QHC Input Modeling Parameters

| | |
|---|---|
| Site Geometry: | AutoCAD or Digitized Mapping |
| Traffic Data: | AM & PM Peak Hour Volumes |
| Receptor Height | 6 feet (1.8 meters) |
| Averaging Period | 60 minutes (1 hr) |
| Meteorology: | - Wind Speed 1 meter per second<br>- Atmospheric Stability E (5)<br>- Mixing Height 1000 meters<br>- Wind Angle 10° Increments for 0°-360° |
| Surface Roughness: | 108 cm. (single family residential)<br>175 cm (office area)<br>74 cm (corn)<br>11 cm (grass) |
| 1-Hr to 8-Hr Persistence Factor: | 0.7 (USEPA/IEPA recommended default) |
| Eight-hour Background CO Value: | 2.0 ppm |



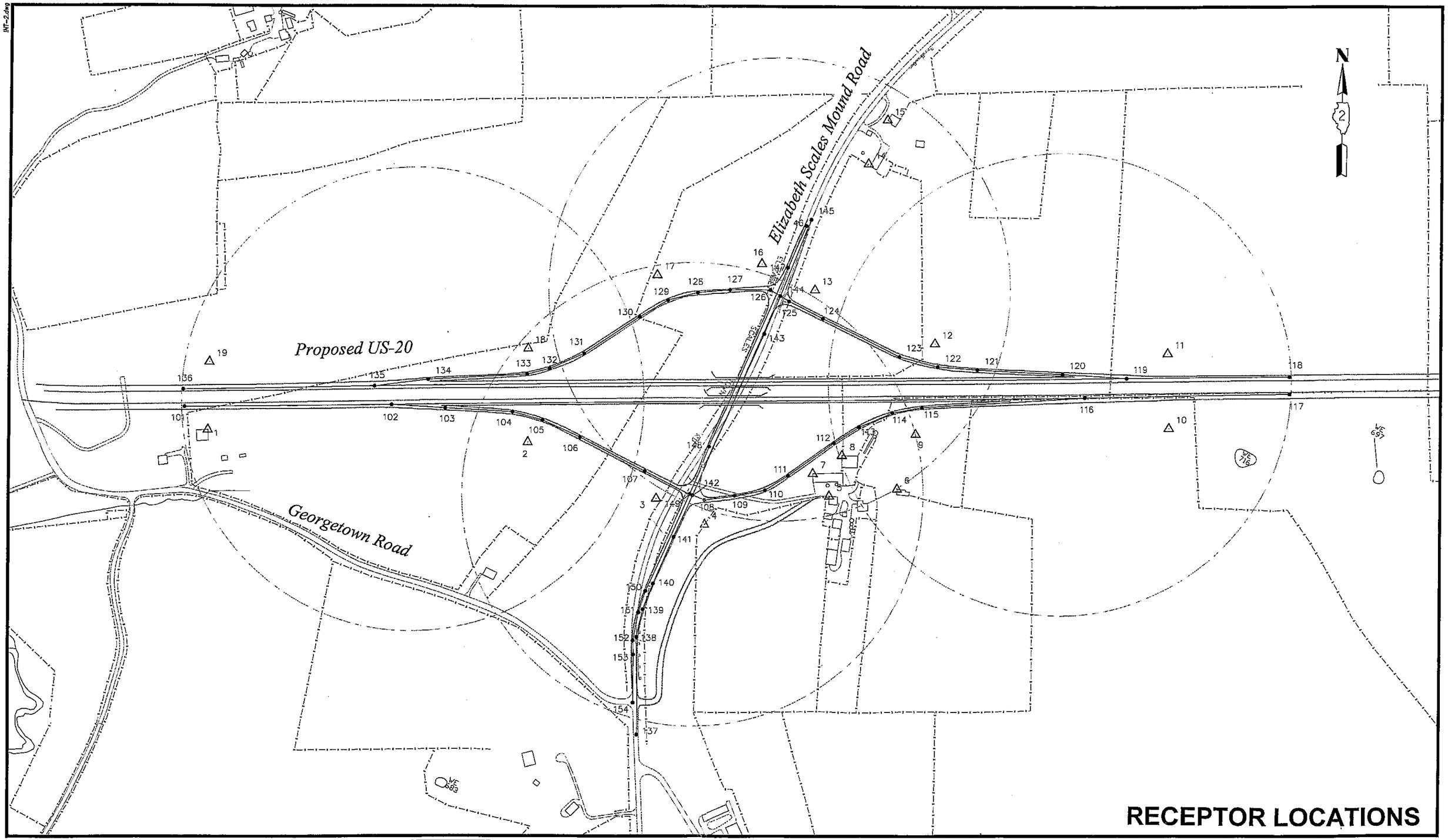

# RECEPTOR LOCATIONS

| | | | |
|---|---|---|---|
| STATE OF ILLINOIS<br>DEPARTMENT OF TRANSPORTATION<br>US 20 (F.A.P. 301) IMPROVEMENTS PROJECT | LOUIS BERGER GROUP, INC. | TOWN OF LENA<br>US 20 EXISTING CONDITION<br>Scale: 1" = 800' | File: US20FULL.dwg |

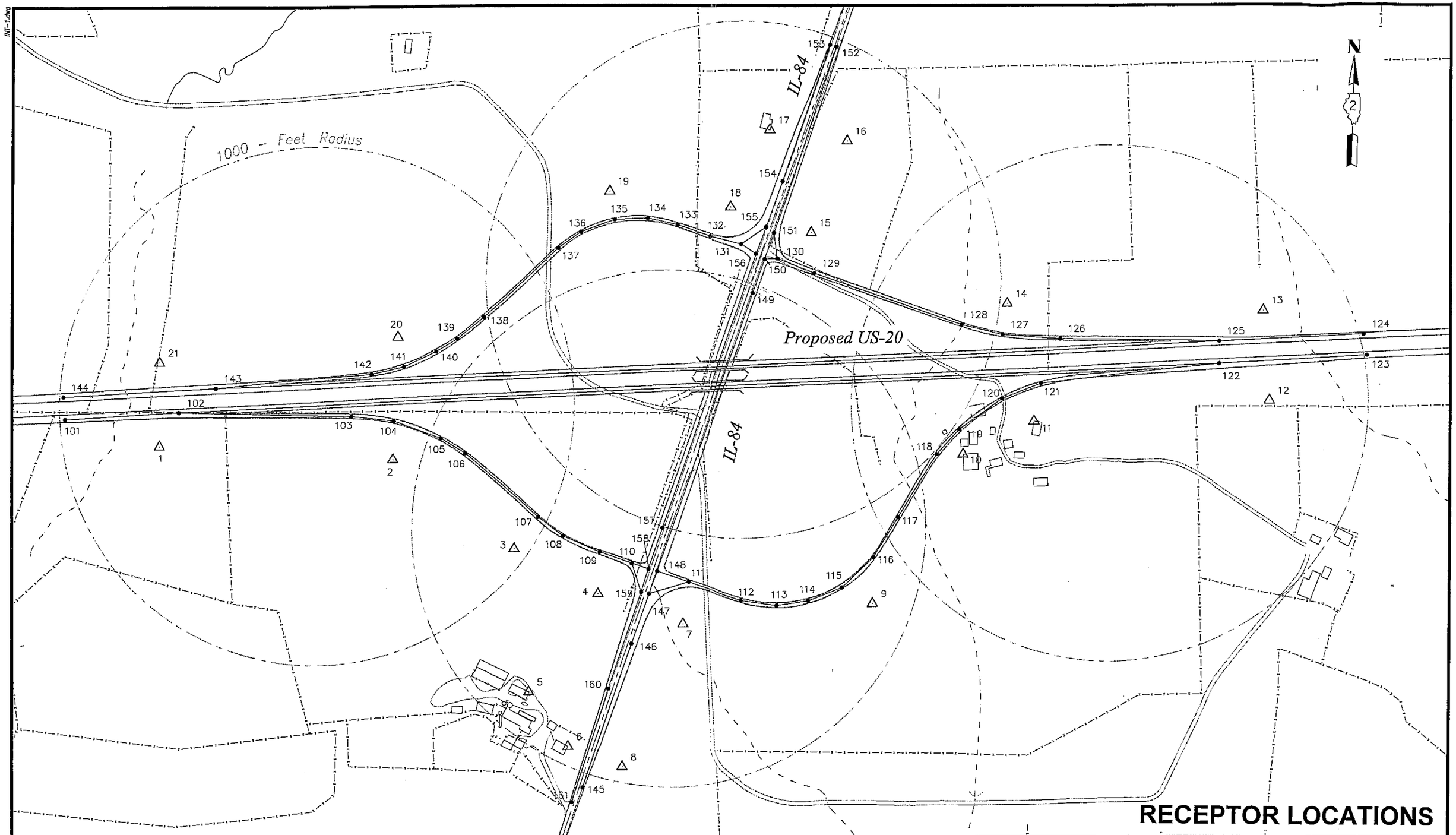



# RECEPTOR LOCATIONS

| | | | |
|---|---|---|---|
| STATE OF ILLINOIS<br>DEPARTMENT OF TRANSPORTATION<br>US 20 (F.A.P. 301) IMPROVEMENTS PROJECT | LOUIS BERGER GROUP, INC. | TOWN OF LENA<br>FREEWAY/EXPRESSWAY ALTERNATIVES<br>Scale: 1" = 800' | File: US2OFULL.dwg |




| | | | |
|---|---|---|---|
| STATE OF ILLINOIS<br>DEPARTMENT OF TRANSPORTATION<br>US 20 (F.A.P. 301) IMPROVEMENTS PROJECT | LOUIS BERGER GROUP, INC. | FREEWAY: ALTERNATES 1 AND 2<br>Scale: 1"=350 Feet | INT-2.dwg |




| | | | |
|---|---|---|---|
| STATE OF ILLINOIS<br>DEPARTMENT OF TRANSPORTATION<br>US 20 (F.A.P. 301) IMPROVEMENTS PROJECT | LOUIS BERGER GROUP, INC. | **FREEWAY: ALTERNATES 3 THROUGH 10**<br>Scale: 1"=350 Feet | INT-1.dwg |