APPENDIX 24

AIR QUALITY STUDY

AIR QUALITY ASSESSMENT

BELLEAYRE RESORT AT CATSKILL PARK
TOWNS OF SHANDAKEN AND MIDDLETOWN
ULSTER AND DELAWARE COUNTIES

FEBRUARY 2011

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PROJECT NO. 99-057

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AIR QUALITY ASSESSMENT

As part of the New York State Environmental Quality Review Act (SEQRA) requirements, an air quality assessment was conducted for the proposed *Belleayre Resort at Catskill Park*. The air quality assessment conducted conforms to the procedures followed by the New York State Department of Environmental Conservation (NYSDEC). Currently, the NYSDEC follows the procedures outlined in the New York State Department of Transportation (NYSDOT) Environmental Procedures Manual (EPM), Chapter 1.1, Air Quality, last updated January 2001. These procedures address the Clean Air Act Amendments of 1990 and guidance from the Environmental Protection Agency (EPA).

1.0 Existing Conditions

New York State collects air quality data for numerous pollutants at monitoring stations in each county through a program operated by the Bureau of Air Quality Surveillance. The EPA prescribes what pollutants are required to be monitored at different locations based on the characteristics of each region. Therefore, monitoring stations are disbursed throughout New York State with each station monitoring certain pollutants. In addition to the continuous and manual monitors in each county, ambient air quality data from private networks (utilities) is also an integral part of the state database for pollutants. The data from each monitoring station is recorded and summarized in the *New York State Air Quality Report, Air Monitoring System*. The latest data tables available are for the year 2009.

The project is located in Ulster and Delaware Counties, which are both classified as attainment areas for carbon monoxide and ozone. The monitoring station at Belleayre Mountain in Ulster County, which monitors sulfur dioxide and ozone, is located within the project limits. The closest monitoring station to the project site that monitors carbon monoxide is located north of the study area in Schenectady. Based on the results of the NYSDEC report, the Belleayre and Schenectady stations were in compliance with the current New York State and Federal Ambient Air Quality Standards for each monitored pollutant in 2009.

Two types of inhalable particulates are monitored; those with aerodynamic diameters of 10 microns or less (PM_{10}) and those with aerodynamic diameters of 2.5 microns or less ($PM_{2.5}$). The monitoring station at Belleayre Mountain does not monitor PM_{10} or $PM_{2.5}$. However, a monitoring station located north of the study area in Albany monitors $PM_{2.5}$. The data shows that this station was in compliance with the average 98^{th} percentile and average annual means for the latest three year period. The only stations in New York state that monitor PM_{10} are located in New York City, Rochester, and Buffalo. The geographical distance and the character of the study area are very different than these areas therefore the PM_{10} pollutant information from the New York City, Rochester, and Buffalo stations are not applicable to the *Belleayre Resort at Catskill Park* study area.

2.0 Microscale Air Quality

2.1 General Requirements

A microscale air quality analysis is performed to determine carbon monoxide concentrations at various worst case receptors adjacent to the roadways in a project area. Based on the procedures outlined in the EPM, worst case receptors are typically chosen at signalized intersections where a level of service D, E, or F exists for the build conditions. Unsignalized intersections do not typically warrant a detailed air quality analysis since the major-street high volume approaches at these intersections operate as free flow conditions. Any intersection

requiring a detailed air quality analysis based on the level of service criteria undergoes additional screenings based on an analysis of the site conditions with respect to the reduction in source-receptor distances, traffic volume increases, vehicle emission increases, and speed reduction. The screening process is used to pinpoint locations where vehicle emissions will be the highest and will contribute to the background air quality. Any detailed air quality analysis is conducted using CAL3QHC, Version 2.0, which is a computer based air quality dispersion model. This model is based on traffic parameters from the *Highway Capacity Manual* (HCM) and is capable of analyzing intersection and free flow receptors.

2.2 Intersection Screening Analysis

Based on a review of the Final Scoping Document and an assessment of the intersections analyzed in the Traffic Impact Study prepared for this project, the seven intersections listed below were assessed for air quality:

- NY Route 28/NY Route 214/South Street
- NY Route 28/NY Route 42
- NY Route 28/County Road 47
- NY Route 28/Main Street
- NY Route 28/County Road 49A/Owl Nest Road
- County Road 49A/Gunnison Road/Belleayre Lower Driveway
- County Road 49A/Belleayre Upper Driveway

The information presented in the Traffic Impact Study prepared for this project indicates that the seven intersections in the project area are unsignalized intersections that do not require a detailed air quality assessment. Intersection improvements were recommended at the NY Route 28/County Road 49A/Owl Nest Road intersection to install a traffic signal to operate in three-color mode during the winter months and on flash mode during the other months. During winter months traffic signal warrant criteria are met for the No-Build condition prior to the construction of the proposed project. With the installation of a traffic signal and geometric improvements to add turn lanes, the intersection is expected to operate with an overall level of service D during the peak Saturday No-Build and Build volume conditions. The screening criteria were reviewed for the Route 28/County Road 49A/Owl Nest Road intersection based on the future installation of a traffic signal.

The next step of the screening, capture criteria screening, states that a detailed air quality analysis is required if at least one of the following criteria is met:

1. A 10% or more reduction in the source-receptor distance.
2. A 10% or more increase in traffic volume on affected roadways.
3. A 10% or more increase in vehicle emissions.
4. Any increase in the number of queued lanes.
5. A 20% reduction in speed when the estimated average speed is 30-mph or less.

An evaluation at the NY Route 28/County Road 49A/Owl Nest Road intersection indicates that the installation of a traffic signal and the changes in approach geometry will result in an increase in the number of queued lanes at the intersection. Therefore, this intersection requires the next step of screening, volume threshold screening, which is based on traffic volumes and emission factors.

The traffic volume screening criteria for signalized intersections is based on Table 3C from Chapter 1.1 of the EPM. The screening requires the calculation of both free flow and queue link emission factors to determine the intersection approach volume thresholds. The emission

factors for each intersection approach were calculated based on procedures outlined in the EPM and using the latest Mobile Emission Factor Table for Ulster County. The volume thresholds were compared to the Build condition volumes representing the worst case traffic volumes at the intersection.

Table 1 – Traffic Volume Screening Summary

Intersection Approach	Emission Factors		Peak Hour Volume Threshold (Table 3C)	2015 Build Volumes	Volume Lower Than Criteria?
	Idle	Free flow			
Route 28 EB	40.4	4.8	4,000	161	Yes
Route 28 WB	40.4	4.8	4,000	333	Yes
CR 49A NB	39.9	4.9	4,000	1,419	Yes
Owl Nest Rd SB	39.9	4.9	4,000	2	Yes

Based on the above site screening analysis the 2015 Build Volumes are lower than the criteria shown in the EPM Table 3C. Therefore, an air quality analysis is not necessary since this project will not increase traffic volumes, reduce source-receptor distances or change other existing conditions to such a degree as to jeopardize attainment of the National and New York State ambient air quality standards.

3.0 Mesoscale Air Quality

3.1 General Requirements

A mesoscale air quality analysis is conceptually similar to the microscale air quality analysis; however, it covers a larger geographic area, typically larger than the immediate project area. In addition to carbon monoxide, a mesoscale air quality analysis monitors for volatile organic compounds (VOC) and nitrogen oxides (NO_x). In general, a mesoscale air quality analysis is required for projects involving the following:

1. HOV lanes vs general use lanes
2. New or significant modification to interchanges on access-controlled facilities
3. Large-scale signal coordination projects
4. In attainment areas, projects having alternatives (including the no-build) with significantly different (10%) VMT
5. Widening to provide additional travel lanes more than a mile in length.

The criteria for a mesoscale air analysis found in Chapter 1.1 of the EPM are not met with the development of the project; therefore, a mesoscale analysis is not required.

4.0 Particulate Matter Analysis

4.1 General Requirements

Particulate Matter (PM) is a mixture of substances that include elements such as carbon and metals; compounds such as nitrates, organic and ammonium compounds, and sulfates; and complex mixtures such as diesel exhaust and soil. Some of these particles are emitted directly into the atmosphere. Others, referred to as secondary particles, result from gases that are transformed into particles through physical and chemical processes in the atmosphere. As noted, there are two types of inhalable particulates; those with aerodynamic diameters of 10 microns or less (PM_{10}) and those with aerodynamic diameters of 2.5 microns or less ($PM_{2.5}$).

Many scientific studies have linked breathing PM to a series of significant health problems including aggravated asthma, increase in respiratory symptoms like coughing and difficult or painful breathing, chronic bronchitis, decrease lung function, and premature death. As a result, NYSDOT requires that transportation project level air quality impact analyses consider both PM_{10} and $PM_{2.5}$. As of September, 2004 the NYSDOT is requiring all non-Categorical Exclusion and non-Type II Action projects that result in increased traffic volumes to undergo microscale and mesoscale emissions analysis for both PM_{10} and $PM_{2.5}$ as outlined in Chapter 1 of the EPM.

4.2 Particulate Matter Microscale Analysis

The NYSDOT Project Level Particulate Matter Analysis Final Policy (PM Final Policy), dated September 2004, provides guidance for performing a PM analysis. The policy states that only intersections that are most likely to experience a PM air quality impact need to be analyzed. Therefore, only the NY Route 28/County Road 49A/Owl Nest Road intersection requires detailed analysis. The detailed intersection air quality analysis model includes a distance of approximately 1,000 feet along each intersection approach.

4.2.1 CAL3QHC Model Inputs

Based on procedures outlined in the PM Final Policy the PM microscale air quality analysis was performed using CAL3QHC, Version 2.0, which is a line based dispersion model. The CAL3QHC procedures require inputs for roadway geometrics, traffic volumes, receptor locations, meteorological conditions, and vehicular emission rates. Additional inputs such as signal timing data, saturation flow rate, signal type, and arrival type are also necessary when modeling signalized intersections. Based on a review of the project area and the EPM procedures, the CAL3QHC data inputs outlined in Table 2 were used to represent worst case meteorological conditions.

Table 2 – Summary of Meteorological Data Inputs

Description	Model Input
Stability Class	E
Wind Speed	1 meter/second
Roadway Wind Angle	0^0 to 360^0 at 5^0 intervals
Averaging Time	60 minutes
Surface Roughness Coefficient	11.4 cm
Settling Velocity	0 centimeters/second
Deposition Velocity	0 centimeters/second
Mixing Height	1,000 meters

Vehicular emission rates were determined using MOBILE 6.2 Emission Factor Tables A1, A2, A3, and A4 for Ulster County in NYSDOT Region 8. These tables provide PM_{10} and $PM_{2.5}$ emission factors for different vehicle classes in grams/mile for use in free flow links, and emission factors in grams/hour at 0 mph (idle) for use in queue links. The vehicle emission factor calculations are included in Appendix A.

4.2.2 Analysis Results

The particulate matter analysis was conducted for the Saturday PM peak hour consistent with the traffic study. The two averaging periods used in the assessment of air quality impacts are the one-hour (worst hour) and the 24-hour PM concentrations. Table 3 shows the maximum concentration difference thresholds between no-build and build conditions that may result in

potential significant environmental impacts. If the results of the Level I Microscale Analysis show a difference between no-build and build conditions that are above the allowable thresholds, a Level II Microscale Analysis must be conducted.

Table 3 – Potential Significant Impact Thresholds

PM Size	24-hour Average	Annual Arithmetic Mean
PM_{10}	5.0 µg/m^3	1.0 µg/m^3
$PM_{2.5}$	5.0 µg/m^3	0.3 µg/m^3

Below is a discussion of the results of the air quality analysis for the no-build and build conditions CAL3QHC model runs that include one study area intersection for the Saturday peak hour traffic period.

Fifty-eight air quality receptors were included in the CAL3QHC model to represent worst-case conditions in the area. Receptors were chosen along roadway shoulder locations where people are likely to be most noticeably present in the project corridor. The receptor locations are shown on printouts of the air quality model network included in Appendix B. All of the receptors were modeled for the no-build and build conditions. Table 4 identifies the receptors with the largest difference in concentration between no-build and build conditions for the peak hour of the Particulate Matter analysis. The table also summarizes the 24-Hour and Annual concentrations for each analysis condition.

Table 4 – PM Concentrations

Analysis Period and PM Size	Receptor Number	Concentration[1]		
		Hourly	24-Hour	Annual
PM Peak Hour PM_{10}	13	0.1 µg/m^3	0.04 µg/m^3	0.008 µg/m^3
PM Peak Hour $PM_{2.5}$	13	0.1 µg/m^3	0.04 µg/m^3	0.008 µg/m^3

[1]Represents the difference in concentration between the no-build and build conditions.

The results of the air quality analysis indicate that the differences in concentration between the no-build and build analysis at all fifty-eight receptors are below the potential significant impact thresholds shown in Table 3. The particulate matter concentrations and differences for all receptors are included in Appendix C.

The predicted particulate matter concentration differences for the receptors have been calculated to be less than the maximum allowable potential significant impact thresholds. This indicates that if the proposed project is constructed, the particulate matter concentrations will not result in a violation of the standards. No further analysis is needed.

4.3 Particulate Matter Mesoscale Analysis

As discussed in Section 3.1 projects requiring a mesoscale analysis are those that could have a significant impact on emissions on a regional basis. The proposed project does not meet any of the criteria in Chapter 1.1 of the EPM for a mesoscale analysis; therefore, no particulate matter mesoscale analysis is required.

5.0 Other Pollutants

5.1 Ozone

Ozone concentrations are not estimated as part of an environmental analysis for a transportation project. Motor vehicles do not emit ozone. Although they do emit precursors of ozone (VOC and NO_x), the amount of these emissions are small compared to the total emissions for the regional area and would not affect ozone concentration at or in the vicinity of the project site. In addition, these emissions are transported many miles before the action of sunlight and atmospheric chemistry causes ozone to be formed. Ozone problems are regional problems that are addressed on a scale much larger than the typical project and its relationship to transportation impacts. Ozone concentrations in the project area are not meaningfully affected by the project itself.

6.0 Construction Impacts

The air quality within the project area may experience short-term impacts due to the construction of the project. During construction, airborne particulates will increase as dust is raised by construction vehicles in motion. This increase is expected to be sporadic and short-term in nature and will be most noticeable in the area immediately adjacent to the construction. The impacts should be minimized by the use of dust inhibitors, such as calcium chloride and other dust-control provisions found in the NYSDOT Standard Specifications for construction.

Appendix A
Emission Factor Calculations

Belleayre Resort at Catskill Park
Towns of Shandaken & Middletown, New York

Crossroads, 99-057d
Emission Factors
1/14/2011
AMM

Route 28
Functional Class = Rural Minor Arterial (06)
Speed Limit = 55 mph

Vehicle Distribution		non-idle (55mph)		idle	
type	%	emissions	Total ESS	emissions	Total ESS
LDGV	48.55%	4.84	2.350	38.63	18.755
LDGT1	7.30%	4.70	0.343	35.02	2.556
LDGT2	24.31%	5.05	1.228	37.35	9.080
LDGT3	8.70%	5.19	0.452	38.75	3.371
LDGT4	4.02%	5.27	0.212	39.36	1.582
HDGV2B	1.48%	6.11	0.090	94.75	1.402
HDGV3	0.58%	7.83	0.045	121.37	0.704
HDGV4	0.17%	7.87	0.013	121.98	0.207
HDGV5	0.23%	9.10	0.021	140.97	0.324
HDGV6	0.07%	9.59	0.007	148.63	0.104
HDGV7	0.09%	11.19	0.010	173.43	0.156
HDGV8A	0.13%	12.44	0.016	192.73	0.251
LDDV	0.07%	0.36	0.000	5.89	0.004
LDDT12	0.12%	0.24	0.000	3.90	0.005
LDDT34	0.88%	0.21	0.002	3.35	0.029
HDDV2B	0.26%	0.14	0.000	2.21	0.006
HDDV3	0.19%	0.16	0.000	2.68	0.005
HDDV4	0.12%	0.32	0.000	5.28	0.006
HDDV5	0.16%	0.29	0.000	4.67	0.007
HDDV6	0.12%	0.36	0.000	5.90	0.007
HDDV7	0.20%	0.48	0.001	7.75	0.016
HDDV8A	0.55%	0.90	0.005	14.58	0.080
HDDV8B	0.58%	0.86	0.005	14.02	0.081
HDGB	0.10%	12.94	0.013	200.59	0.201
HDDBT	0.19%	1.21	0.002	19.69	0.037
HDDBS	0.29%	0.72	0.002	11.67	0.034
MC	0.54%	5.51	0.030	255.18	1.378
	100.00%				

Total emission factor 4.849 non-idle 40.390 idle

County Road 49A
Functional Class = Rural Local Road (09)
Speed Limit = 55 mph

Vehicle Distribution		non-idle (55mph)		idle	
type	%	emissions	Total ESS	emissions	Total ESS
LDGV	47.59%	4.84	2.303	38.63	18.384
LDGT1	7.16%	4.70	0.337	35.02	2.507
LDGT2	23.83%	5.05	1.203	37.35	8.901
LDGT3	10.81%	5.19	0.561	38.75	4.189
LDGT4	4.99%	5.27	0.263	39.36	1.964
HDGV2B	1.02%	6.11	0.062	94.75	0.966
HDGV3	0.40%	7.83	0.031	121.37	0.485
HDGV4	0.12%	7.87	0.009	121.98	0.146
HDGV5	0.16%	9.10	0.015	140.97	0.226
HDGV6	0.05%	9.59	0.005	148.63	0.074
HDGV7	0.06%	11.19	0.007	173.43	0.104
HDGV8A	0.09%	12.44	0.011	192.73	0.173
LDDV	0.07%	0.36	0.000	5.89	0.004
LDDT12	0.12%	0.24	0.000	3.90	0.005
LDDT34	1.10%	0.21	0.002	3.35	0.037
HDDV2B	0.18%	0.14	0.000	2.21	0.004
HDDV3	0.13%	0.16	0.000	2.68	0.003
HDDV4	0.08%	0.32	0.000	5.28	0.004
HDDV5	0.11%	0.29	0.000	4.67	0.005
HDDV6	0.08%	0.36	0.000	5.90	0.005
HDDV7	0.14%	0.48	0.001	7.75	0.011
HDDV8A	0.38%	0.90	0.003	14.58	0.055
HDDV8B	0.40%	0.86	0.003	14.02	0.056
HDGB	0.07%	12.94	0.009	200.59	0.140
HDDBT	0.13%	1.21	0.002	19.69	0.026
HDDBS	0.20%	0.72	0.001	11.67	0.023
MC	0.53%	5.51	0.029	255.18	1.352
	100.00%				

Total emission factor 4.861 non-idle 39.852 idle

Crossroads, 99-057d
Emission Factors
3/18/2010
AMM

Route 28
Functional Class = Rural Minor Arterial (06)
Speed Limit = 55 mph

PM10

Vehicle Distribution		non-idle (55mph)		idle	
type	%	emissions	Total ESS	emissions	Total ESS
LDGV	48.55%	0.025	0.0121	0.000	0.0000
LDGT1	7.30%	0.025	0.0018	0.000	0.0000
LDGT2	24.31%	0.025	0.0061	0.000	0.0000
LDGT3	8.70%	0.025	0.0022	0.000	0.0000
LDGT4	4.02%	0.025	0.0010	0.000	0.0000
HDGV2B	1.48%	0.038	0.0006	0.000	0.0000
HDGV3	0.58%	0.050	0.0003	0.000	0.0000
HDGV4	0.17%	0.050	0.0001	0.000	0.0000
HDGV5	0.23%	0.050	0.0001	0.000	0.0000
HDGV6	0.07%	0.058	0.0000	0.000	0.0000
HDGV7	0.09%	0.066	0.0001	0.000	0.0000
HDGV8A	0.13%	0.095	0.0001	0.000	0.0000
LDDV	0.07%	0.060	0.0000	0.000	0.0000
LDDT12	0.12%	0.065	0.0001	0.000	0.0000
LDDT34	0.88%	0.041	0.0004	0.000	0.0000
HDDV2B	0.26%	0.034	0.0001	1.007	0.0026
HDDV3	0.19%	0.042	0.0001	1.008	0.0019
HDDV4	0.12%	0.055	0.0001	1.014	0.0012
HDDV5	0.16%	0.053	0.0001	1.026	0.0016
HDDV6	0.12%	0.087	0.0001	1.029	0.0012
HDDV7	0.20%	0.088	0.0002	1.024	0.0020
HDDV8A	0.55%	0.166	0.0009	1.061	0.0058
HDDV8B	0.58%	0.138	0.0008	1.034	0.0060
HDGB	0.10%	0.066	0.0001	0.000	0.0000
HDDBT	0.19%	0.218	0.0004	1.062	0.0020
HDDBS	0.29%	0.136	0.0004	1.020	0.0030
MC	0.54%	0.037	0.0002	0.000	0.0000
	100.00%				

Total emission factor 0.028 non-idle 0.027 idle

PM2.5

Vehicle Distribution		non-idle (55mph)		idle	
type	%	emissions	Total ESS	emissions	Total ESS
LDGV	48.55%	0.011	0.0053	0.000	0.0000
LDGT1	7.30%	0.011	0.0008	0.000	0.0000
LDGT2	24.31%	0.011	0.0027	0.000	0.0000
LDGT3	8.70%	0.011	0.0010	0.000	0.0000
LDGT4	4.02%	0.011	0.0004	0.000	0.0000
HDGV2B	1.48%	0.024	0.0004	0.000	0.0000
HDGV3	0.58%	0.032	0.0002	0.000	0.0000
HDGV4	0.17%	0.032	0.0001	0.000	0.0000
HDGV5	0.23%	0.030	0.0001	0.000	0.0000
HDGV6	0.07%	0.036	0.0000	0.000	0.0000
HDGV7	0.09%	0.043	0.0000	0.000	0.0000
HDGV8A	0.13%	0.052	0.0001	0.000	0.0000
LDDV	0.07%	0.043	0.0000	0.000	0.0000
LDDT12	0.12%	0.048	0.0001	0.000	0.0000
LDDT34	0.88%	0.026	0.0002	0.000	0.0000
HDDV2B	0.26%	0.022	0.0001	0.926	0.0024
HDDV3	0.19%	0.024	0.0000	0.927	0.0018
HDDV4	0.12%	0.037	0.0000	0.933	0.0011
HDDV5	0.16%	0.035	0.0001	0.944	0.0015
HDDV6	0.12%	0.066	0.0001	0.947	0.0011
HDDV7	0.20%	0.067	0.0001	0.942	0.0019
HDDV8A	0.55%	0.123	0.0007	0.976	0.0054
HDDV8B	0.58%	0.097	0.0006	0.951	0.0055
HDGB	0.10%	0.043	0.0000	0.000	0.0000
HDDBT	0.19%	0.187	0.0004	0.977	0.0019
HDDBS	0.29%	0.111	0.0003	0.939	0.0027
MC	0.54%	0.021	0.0001	0.000	0.0000
	100.00%				

Total emission factor 0.014 non-idle 0.025 idle

Crossroads, 99-057d
Emission Factors
3/18/2010
AMM

County Road 49A
Functional Class = Rural Local Road (09)
Speed Limit = 55 mph

PM10

Vehicle Distribution		non-idle (30mph)		idle	
type	%	emissions	Total ESS	emissions	Total ESS
LDGV	47.59%	0.025	0.0119	0.000	0.000
LDGT1	7.16%	0.025	0.0018	0.000	0.000
LDGT2	23.83%	0.025	0.0060	0.000	0.000
LDGT3	10.81%	0.025	0.0027	0.000	0.000
LDGT4	4.99%	0.025	0.0012	0.000	0.000
HDGV2B	1.02%	0.038	0.0004	0.000	0.000
HDGV3	0.40%	0.050	0.0002	0.000	0.000
HDGV4	0.12%	0.050	0.0001	0.000	0.000
HDGV5	0.16%	0.050	0.0001	0.000	0.000
HDGV6	0.05%	0.058	0.0000	0.000	0.000
HDGV7	0.06%	0.066	0.0000	0.000	0.000
HDGV8A	0.09%	0.095	0.0001	0.000	0.000
LDDV	0.07%	0.060	0.0000	0.000	0.000
LDDT12	0.12%	0.065	0.0001	0.000	0.000
LDDT34	1.10%	0.041	0.0005	0.000	0.000
HDDV2B	0.18%	0.034	0.0001	1.007	0.002
HDDV3	0.13%	0.042	0.0001	1.008	0.001
HDDV4	0.08%	0.055	0.0000	1.014	0.001
HDDV5	0.11%	0.053	0.0001	1.026	0.001
HDDV6	0.08%	0.087	0.0001	1.029	0.001
HDDV7	0.14%	0.088	0.0001	1.024	0.001
HDDV8A	0.38%	0.166	0.0006	1.061	0.004
HDDV8B	0.40%	0.138	0.0006	1.034	0.004
HDGB	0.07%	0.066	0.0000	0.000	0.000
HDDBT	0.13%	0.218	0.0003	1.062	0.001
HDDBS	0.20%	0.136	0.0003	1.020	0.002
MC	0.53%	0.037	0.0002	0.000	0.000
	100.00%				

Total emission factor 0.027 non-idle 0.019 idle

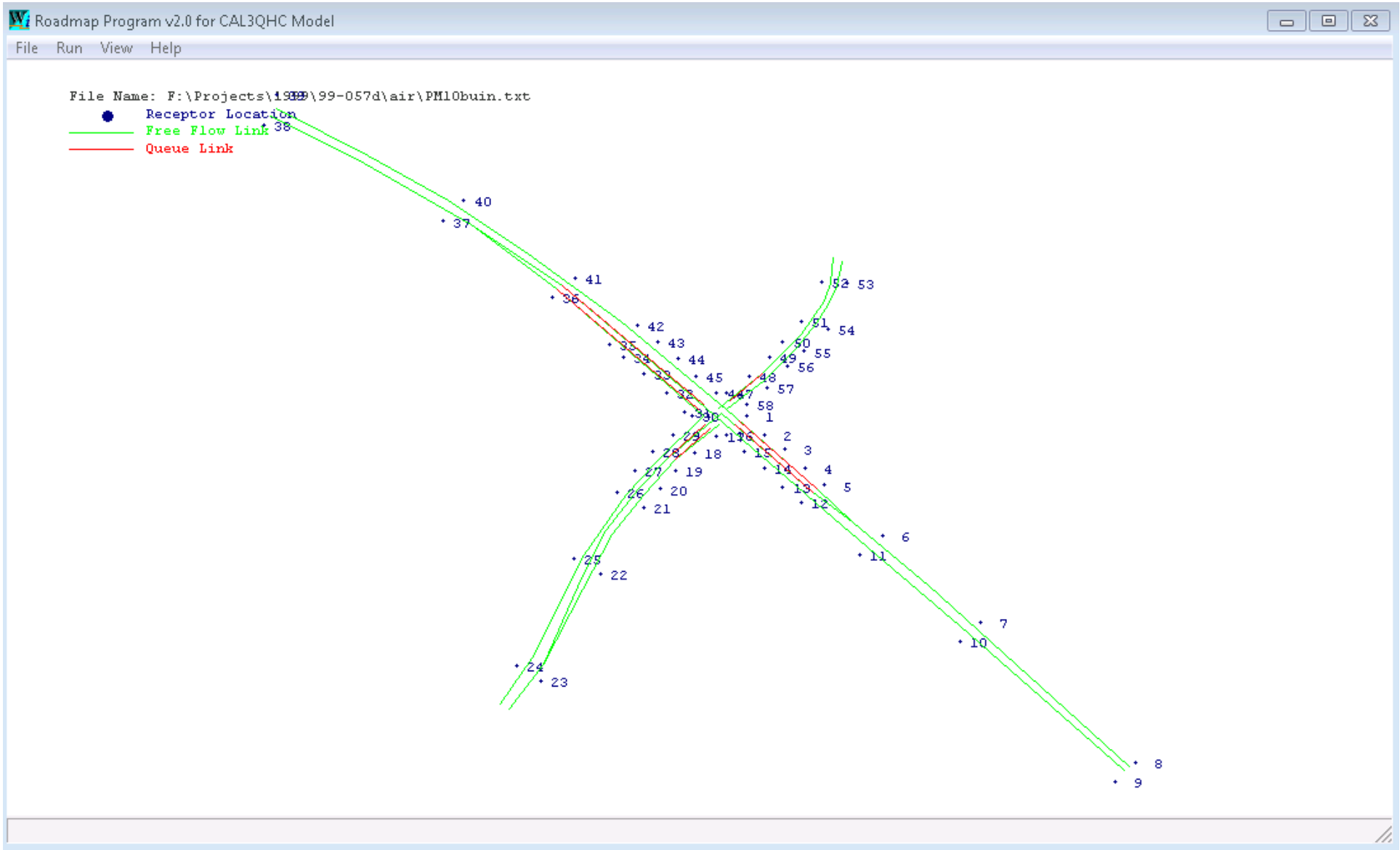
PM2.5

Vehicle Distribution		non-idle (30mph)		idle	
type	%	emissions	Total ESS	emissions	Total ESS
LDGV	47.59%	0.011	0.0052	0.000	0.000
LDGT1	7.16%	0.011	0.0008	0.000	0.000
LDGT2	23.83%	0.011	0.0026	0.000	0.000
LDGT3	10.81%	0.011	0.0012	0.000	0.000
LDGT4	4.99%	0.011	0.0005	0.000	0.000
HDGV2B	1.02%	0.024	0.0002	0.000	0.000
HDGV3	0.40%	0.032	0.0001	0.000	0.000
HDGV4	0.12%	0.032	0.0000	0.000	0.000
HDGV5	0.16%	0.030	0.0000	0.000	0.000
HDGV6	0.05%	0.036	0.0000	0.000	0.000
HDGV7	0.06%	0.043	0.0000	0.000	0.000
HDGV8A	0.09%	0.052	0.0000	0.000	0.000
LDDV	0.07%	0.043	0.0000	0.000	0.000
LDDT12	0.12%	0.048	0.0001	0.000	0.000
LDDT34	1.10%	0.026	0.0003	0.000	0.000
HDDV2B	0.18%	0.022	0.0000	0.926	0.002
HDDV3	0.13%	0.024	0.0000	0.927	0.001
HDDV4	0.08%	0.037	0.0000	0.933	0.001
HDDV5	0.11%	0.035	0.0000	0.944	0.001
HDDV6	0.08%	0.066	0.0001	0.947	0.001
HDDV7	0.14%	0.067	0.0001	0.942	0.001
HDDV8A	0.38%	0.123	0.0005	0.976	0.004
HDDV8B	0.40%	0.097	0.0004	0.951	0.004
HDGB	0.07%	0.043	0.0000	0.000	0.000
HDDBT	0.13%	0.187	0.0002	0.977	0.001
HDDBS	0.20%	0.111	0.0002	0.939	0.002
MC	0.53%	0.021	0.0001	0.000	0.000
	100.00%				

Total emission factor 0.013 non-idle 0.017 idle

Appendix B
CAL3QHC Receptor Locations

Belleayre Resort at Catskill Park
Towns of Shandaken & Middletown, New York


Roadmap Program v2.0 for CAL3QHC Model
File Run View Help
File Name: F:\Projects\1999\99-057d\air\PM10buin.txt
Receptor Location
Free Flow Link
Queue Link
38
40
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43
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Appendix C
CAL3QHC PM Analysis Results

Belleayre Resort at Catskill Park
Towns of Shandaken & Middletown, New York

Particulate Matter CAL3QHC Results
AMM
99-057d

Receptor	2015				2015	
	NB		Build		Difference	
	PM2.5	PM10	PM2.5	PM10	PM2.5	PM10
1	9.0	9.0	9.0	9.0	0.0	0.0
2	9.0	9.0	9.0	9.0	0.0	0.0
3	9.0	9.0	9.0	9.0	0.0	0.0
4	9.0	9.0	9.0	9.0	0.0	0.0
5	9.0	9.0	9.0	9.0	0.0	0.0
6	9.0	9.0	9.0	9.0	0.0	0.0
7	9.0	9.0	9.0	9.0	0.0	0.0
8	9.0	9.0	9.0	9.0	0.0	0.0
9	10.5	10.5	10.6	10.6	0.1	0.1
10	10.7	10.7	10.8	10.8	0.1	0.1
11	10.8	10.8	10.8	10.8	0.0	0.0
12	10.9	10.9	10.9	10.9	0.0	0.0
13	10.8	10.8	10.9	10.9	0.1	0.1
14	11.0	11.0	11.0	11.0	0.0	0.0
15	11.1	11.1	11.2	11.2	0.1	0.1
16	11.2	11.3	11.2	11.3	0.0	0.0
17	10.8	11.8	10.8	11.7	0.0	-0.1
18	10.2	11.6	10.3	11.5	0.1	-0.1
19	9.9	11.4	9.9	11.4	0.0	0.0
20	9.9	11.3	9.9	11.4	0.0	0.1
21	9.8	11.4	9.8	11.4	0.0	0.0
22	10.0	12.0	10.0	11.8	0.0	-0.2
23	10.1	12.1	10.1	12.0	0.0	-0.1
24	9.0	9.0	9.0	9.0	0.0	0.0
25	9.1	9.1	9.1	9.1	0.0	0.0
26	9.2	9.2	9.2	9.2	0.0	0.0
27	9.1	9.1	9.1	9.1	0.0	0.0
28	9.2	9.2	9.2	9.2	0.0	0.0
29	9.3	9.3	9.3	9.3	0.0	0.0
30	9.8	9.8	9.7	9.7	-0.1	-0.1
31	9.7	9.7	9.7	9.7	0.0	0.0
32	9.6	9.6	9.6	9.6	0.0	0.0
33	9.6	9.6	9.5	9.5	-0.1	-0.1
34	9.5	9.5	9.5	9.5	0.0	0.0
35	9.5	9.5	9.5	9.5	0.0	0.0
36	9.6	9.6	9.6	9.6	0.0	0.0
37	9.6	9.6	9.6	9.6	0.0	0.0
38	9.0	9.0	9.0	9.0	0.0	0.0
39	9.0	9.0	9.0	9.0	0.0	0.0
40	9.0	9.0	9.0	9.0	0.0	0.0
41	9.0	9.0	9.0	9.0	0.0	0.0
42	9.0	9.0	9.0	9.0	0.0	0.0
43	9.0	9.0	9.0	9.0	0.0	0.0
44	9.0	9.0	9.0	9.0	0.0	0.0
45	9.0	9.0	9.0	9.0	0.0	0.0
46	9.0	9.0	9.0	9.0	0.0	0.0
47	9.0	9.0	9.0	9.0	0.0	0.0
48	9.0	9.0	9.0	9.0	0.0	0.0
49	9.0	9.0	9.0	9.0	0.0	0.0
50	9.0	9.0	9.0	9.0	0.0	0.0
51	9.0	9.0	9.0	9.0	0.0	0.0
52	9.0	9.0	9.0	9.0	0.0	0.0
53	9.0	9.0	9.0	9.0	0.0	0.0
54	9.0	9.0	9.0	9.0	0.0	0.0
55	9.0	9.0	9.0	9.0	0.0	0.0
56	9.0	9.0	9.0	9.0	0.0	0.0
57	9.0	9.0	9.0	9.0	0.0	0.0
58	9.0	9.0	9.0	9.0	0.0	0.0

Receptor	Concentrations		
	Hourly	24-hour 0.4	Annual 0.08
9	0.1	0.04	0.008
10	0.1	0.04	0.008
13	0.1	0.04	0.008
15	0.1	0.04	0.008
18	0.1	0.04	0.008
20	0.1	0.04	0.008