

STUDY OF BASELINE QUALITY OF AMBIENT AIR WITHIN THE NEW JERSEY MEADOWLANDS DISTRICT: MODELING COMPONENTS

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The objective of this project is to investigate and quantify baseline ambient air quality in the vicinity of the Meadowlands District, using various available emissions, land-use, meteorological, etc. databases, along with the results of a field measurement study. Iterations of air quality modeling were performed employing a series of steps: (a) estimation of background levels of air toxics, (b) preprocessing of emission inventories, (c) preprocessing of local meteorology information, (d) estimation of local ambient concentrations of air toxics of concern through applications of local-scale air quality models such as the Industrial Source Complex Short Term Version 3 (ISCST3) and AMS/EPA Regulatory Model Improvement Committee Model (AERMOD).

Dispersion modeling was performed for receptors corresponding to 4 fixed site monitor locations within the Meadowlands district for 20 sets of 3-day periods, from March 17 to November 6, 2005, corresponding to the field sampling dates at these monitors.

National Emission Inventory (NEI) data corresponding to the years 1999 and 2002 were processed through the Emissions Modeling System for Hazardous Air Pollutants Version 3 (EMS-HAP) for various air toxics of concern (e.g. benzene, formaldehyde, TCE, PERC, arsenic, lead, mercury).

Two different sets of meteorological inputs (Newark Airport data and MERI station data) were used in the dispersion modeling to test the sensitivity of the predicted ambient concentrations. The modeling results for selected air toxics of concern were compared with field measurements collected at the four fixed-site monitors. A subset of three-day-long hourly simulation periods overlapping the 48-hour sampling periods were extracted and averaged to be compared with the corresponding 48 hour integrated ambient measurement.

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