



# City of Cleveland Division of Air Quality



## George T. Craig National Core (NCore) Monitoring Station Work Plan

## **Introduction**

Guidance was issued by the United States Environmental Protection Agency (USEPA) published in the amendments to the ambient air monitoring regulations for criteria pollutants. The amendments detailed actions to improve ambient air quality monitoring on a national scale. The objective is to locate sites in broadly representative urban and rural locations. The Cleveland area in north east Ohio was determined to be an area of interest and concern. The George T. Craig Site also known as (G.T. Craig) was selected due to the current array of monitors located at this site.

## **Multi- pollutant Monitoring Site- George T. Craig**

The G.T Craig site is on a city owned parcel south of the downtown area and is located at the corner of 14<sup>th</sup> Street and Orange Avenue. The site was established on January 8, 1993. It is one of the agencies largest monitoring sites. G.T.Craig is located in what can be considered a buffer zone between the outer boundary of the city and the Industrial valley. It is located approximately .9 miles from what is considered the central mass of the downtown area. The site is at the junction of two main interstate freeways, I-90 and I-77. Cleveland DAQ is currently operating an Integrated Atmospheric Deposition Network (IADN) unit for Indiana University. The IADN instruments are a precipitation sampler, organics Hi-volume sampler and Belfort rain gauge.

The USEPA Office of Research and Development, National Exposure Research Laboratory, Human Exposure and Atmospheric Sciences Division has chosen The G.T Craig site as an area of interest in which to conduct their study. The study will attempt to quantify local, urban and regional air pollution sources in Cleveland using a combination of high and low time resolution sampling, high sensitivity analytical methods, and receptor modeling tools. The study will consist of two 5 week intensives, the summer 2009 and the winter of 2010.

In order to accommodate the additional growth to a NCore site the agency is in the process of upgrading the site which will include a larger shelter and associated larger platform above the shelter to fit additional instruments and allow for growth as well as upgrades to the electrical system in anticipation of the increased power demand. Site upgrade is expected to be completed by mid-June 2009.

Other sites within CDAQ jurisdiction were considered. None offered the uniqueness of interfacing a major industrial area and populated city center as this site. This site met the following EPA considerations for site selection:

- Long-term site useful for a variety of applications including air quality trends, model evaluation, and tracking metropolitan area statistics
- Represent a broad urban or regional scale
- Not be impacted by local sources that do not influence the entire area
- Collocation with FRMs

Monitor Type	Designation	Analysis Method	Frequency of Sampling
Carbon Monoxide (CO) Thermo 48i-TLE	NCORE	Automated Reference method utilizing trace level non-dispersive infrared analysis.	Continuously
Total Reactive Nitrogen (NO <sub>y</sub> ) Thermo 42i-Y	NCORE/AQI	Automated trace level chemiluminescence analysis.	Continuously
Sulfur Dioxide (SO <sub>2</sub> ) Thermo 43i-TLE	NCORE	Automated trace level UV fluorescence analysis	Continuously
Ozone (O <sub>3</sub> )	NCORE/AQI	Automated UV absorption photometry analysis.	Continuously
Meteorological	NCORE	Air quality measurements approved instrumentation for wind speed, wind direction, humidity, barometric pressure temperature, rainfall, and solar radiation	Continuously
PM <sub>2.5</sub> TEOM R&P	NCORE/AQI	Tapered Element Oscillating Microbalance/gravimetric analysis	Continuously
PM <sub>10</sub> TEOM R&P	NCORE/AQI	Tapered Element Oscillating Microbalance/gravimetric analysis	Continuously
PM <sub>2.5</sub> Speciation Met One SASS	NCORE	Multi-species manual collection method utilizing thermal optical, ion chromatography, gravimetric, and X-ray fluorescence analysis.	1/3 days
PM <sub>2.5</sub> Speciation Met One SASS (collocated)	NCORE	Multi-species manual collection method utilizing thermal optical, ion chromatography, gravimetric, and X-ray fluorescence analyses.	1/6 days
PM <sub>2.5</sub> Speciation URG-3000N (pending)	NCORE	Thermal optical analysis.	1/6 days (TBD)
FRM PM <sub>2.5</sub> Andersen RAAS	NCORE	Manual Reference Method utilizing gravimetric analysis.	1/3 days
FRM PM <sub>10</sub> GMT-1200	NCORE	Manual Reference Method utilizing gravimetric analysis.	1/6 days

## Ambient Air Monitoring Network Changes to meet NCore Requirements:

1. Move Ozone monitor from site 39-035-0034 at the Sixth District Police Station (recently renamed Fifth District Police Station) located at 891 E 152<sup>nd</sup> Street to the G. T. Craig site. The Sixth District site was established December 12, 1972. The current NAAQS for ozone is .075 ppm. Based upon the averages of the last six years the 4<sup>th</sup> highest 8 hour averages at the Sixth District site is slightly lower at .0738 ppm than the instrument located at the Berea site (39-035-0064) with an average of .074 ppm. The third monitor in the Cleveland network located on the eastern border of the county is the Mayfield site (39-035-5002) which had the highest six year 4<sup>th</sup> highest 8 hour average of .081 ppm. The distances of the ozone sites from G.T. Craig are 7.7 miles to the Sixth District, 12.9 miles to Berea, and 12.4 miles to Mayfield (See figure 1).

2. Discontinue the operation of the current standard SO<sub>2</sub> and NO<sub>x</sub> instruments. The trace gas analyzers will replace these units.

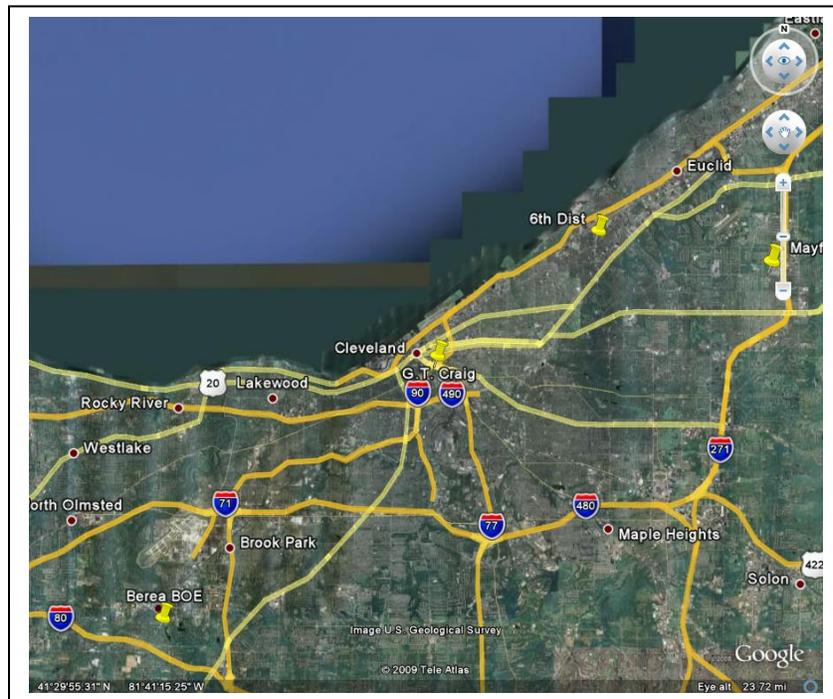


Figure 1

## Quality Assurance

CDAQ will develop a Quality management plan and a Quality Assurance Project Plan in accordance with the guidance provided in 40 CFR 58.

## Area of Representation

Below is the consideration of population density relative to Cuyahoga County and a number of surrounding counties, see figure 2. Figures 3 and 4 indicate neighborhood scale (4 km) and urban (50 km) scale respectively.

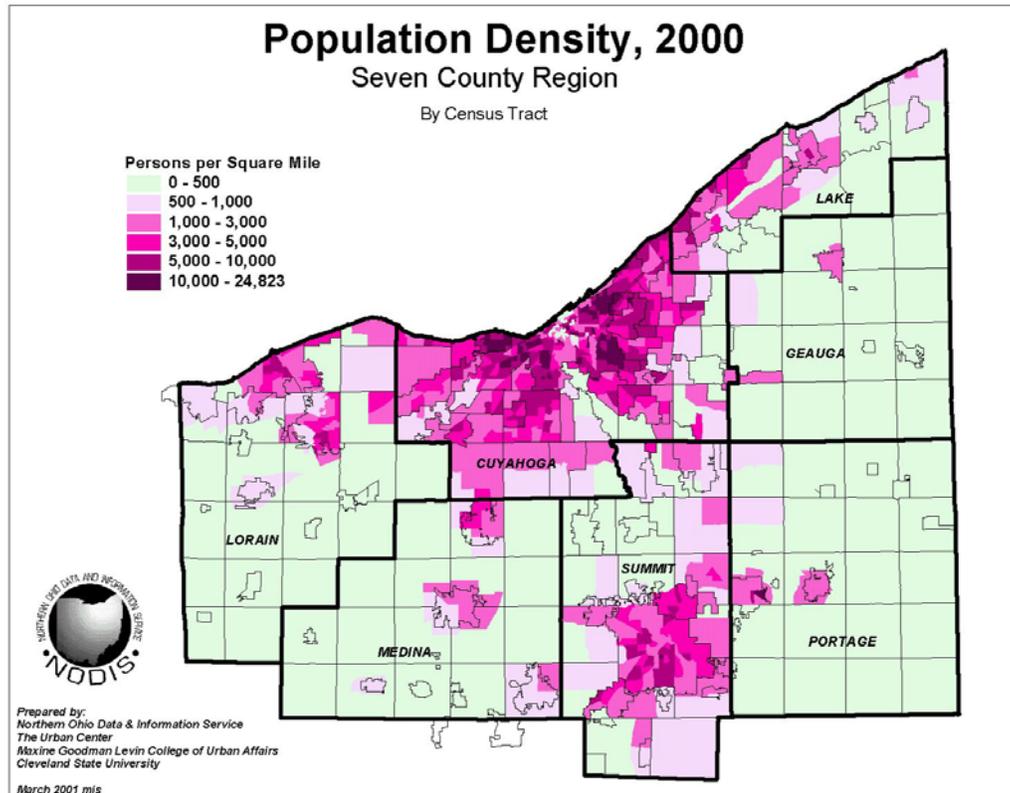


Figure 2



Figure 3



Figure 4

Pollutant	Spatial Scale	Comments
Ozone	Neighborhood and Urban Scale	
NO <sub>x</sub>	Neighborhood and Urban Scale	
Carbon Monoxide	Neighborhood Scale	There is no Urban scale for CO
SO <sub>2</sub>	Neighborhood Scale	There is no Urban scale for SO <sub>2</sub>
PM <sub>10</sub> /PM <sub>2.5</sub> /Lead	Neighborhood and Urban Scale	

Table 1

Roadway	ADT	Distance from site (meters)	Minimum Distance Required (meters)			
			Ozone Table E-1	NO/NO <sub>y</sub> Table E-1	CO Table E-2	PM Figure E-1
E 14 <sup>th</sup> Street	Unk-access rd	18	10	10	10	10
Orange Avenue	9750	30	10	10	10	18
Broadway	9800	18	10	10	10	18
I-77	71670	120	100	100	150	60
I-90	103340	350	100	100	150	100

Table 2

The wind rose provided wind data from two seasons, spring and summer for the G.T Craig site, figures 5 and 6 respectively. Elevated ozone readings for the area generally occur in early spring into summer. Winds are usually from the south. This places the NCore site down wind of the industrialized valley and best for the measurements of transport and secondary pollution into the city center or urban core.

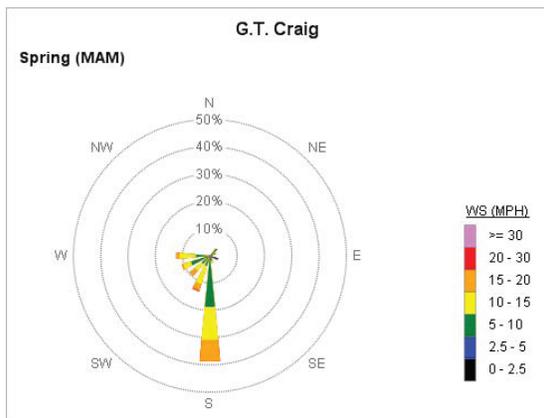


Figure 5

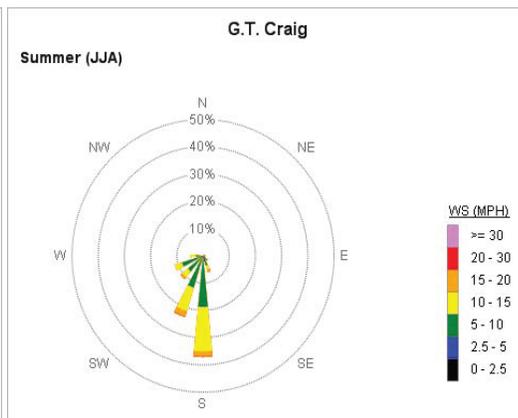


Figure 6

## Site Description

**Site Name:** George T. Craig

**AQS ID:** 39-035-0034

**Location:** 2650 E 14<sup>th</sup> Street

**County:** Cuyahoga

**Coordinates:** Latitude 41.4939, -81.6785

**Date established:** January 8, 1993

**Site approval:** Pending



NW

N

NE



W



E

SW

SE

S

