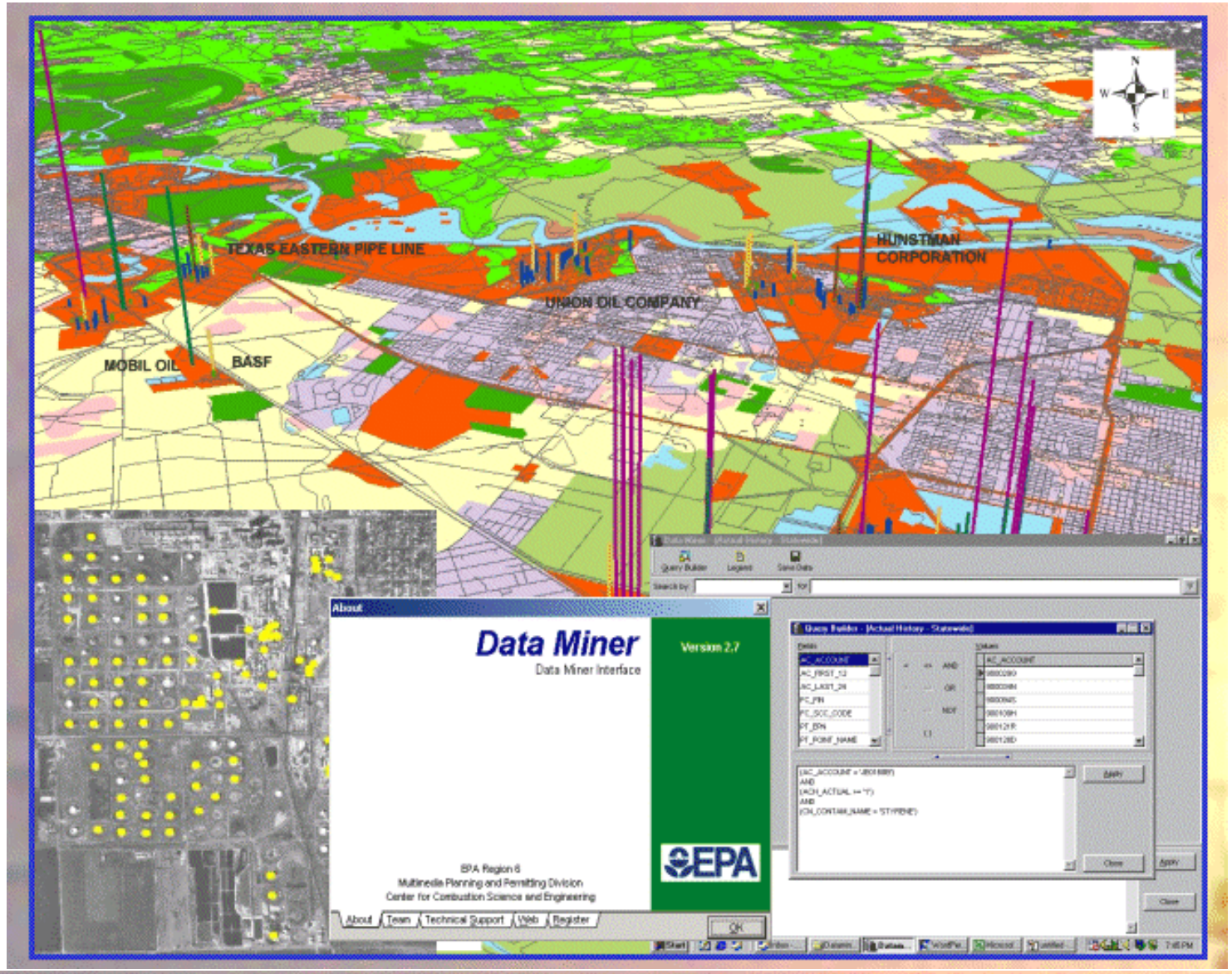
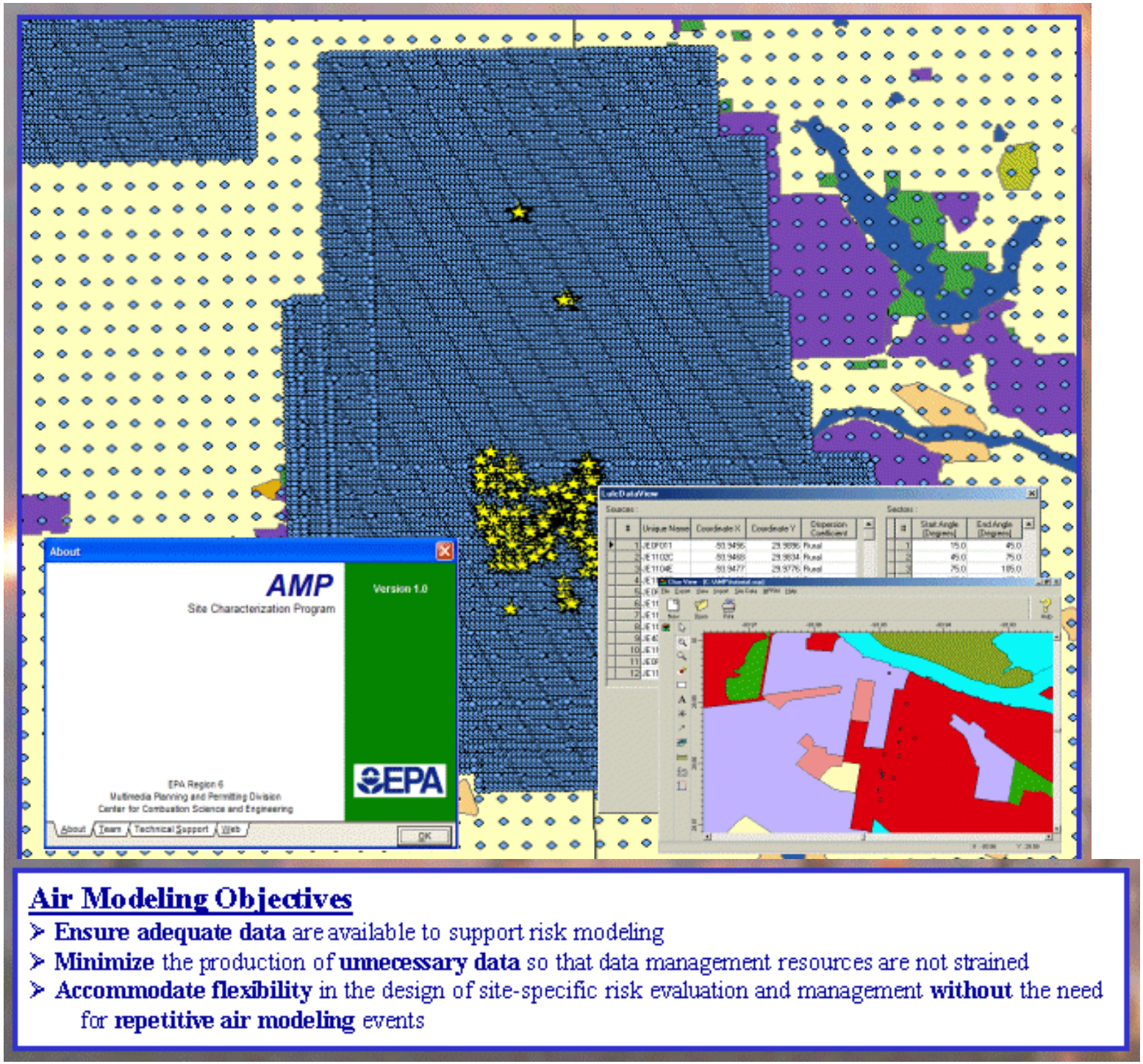
Cumulative Risk Prioritization Tool
EPA Region 6



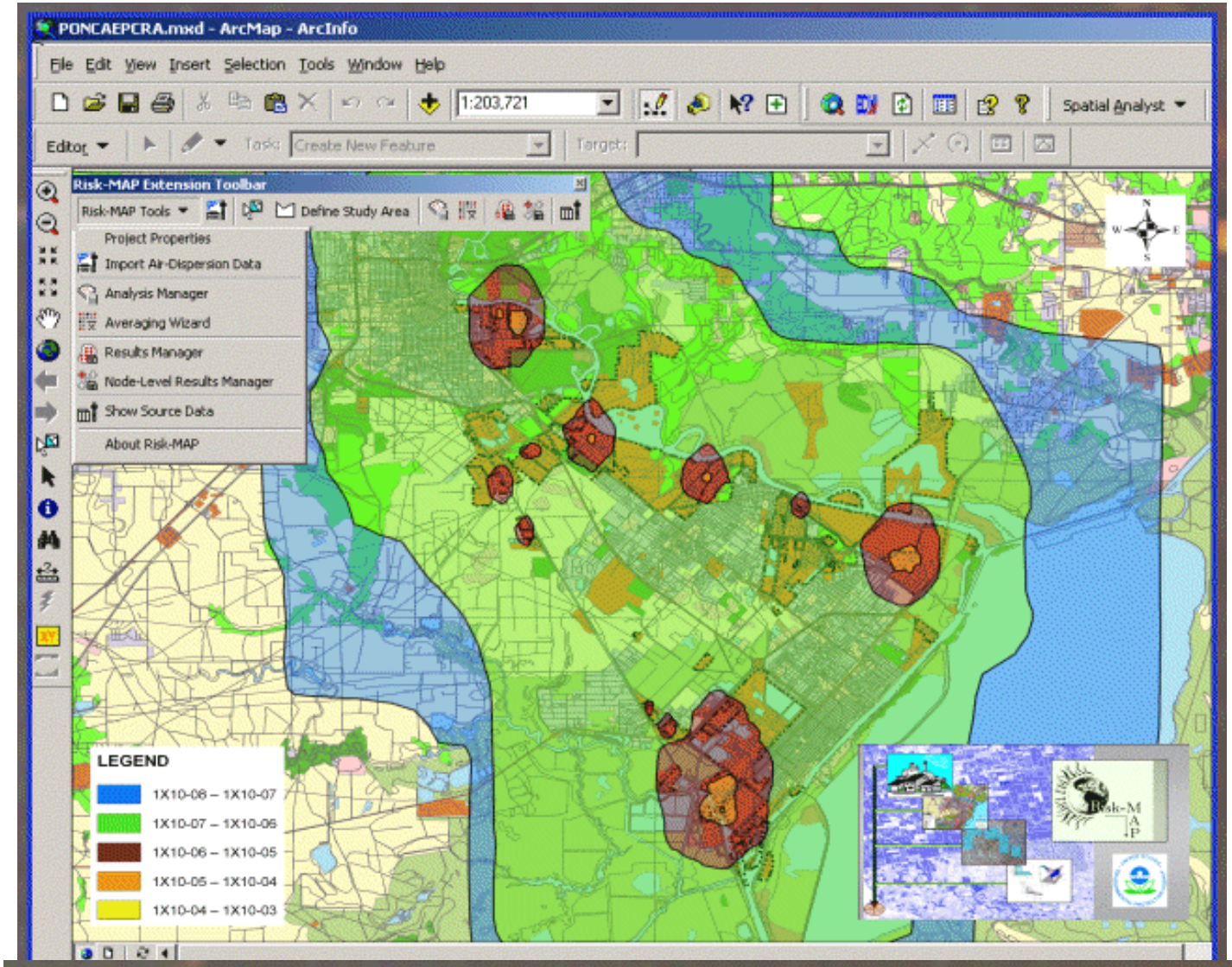
Emissions Characterization Objectives

- Obtain necessary data as **inputs** to complete **air and risk modeling**
- Obtain **resolution** and quality of data to support **source-specific prioritization** and decision making
- Identify and track key **source attributes** to support trending analysis
- Support **attribution profiling** (source/contaminant/exposure pathway)



Air Modeling Objectives

- **Ensure adequate data** are available to support risk modeling
- **Minimize** the production of **unnecessary data** so that data management resources are not strained
- **Accommodate flexibility** in the design of site-specific risk evaluation and management **without** the need for **repetitive air modeling** events



Risk Modeling Objectives

- Generate results in a timely and interactive manner so as to actually be **useful in day-to-day permitting, planning, and enforcement activities**
- Generate results at a level of resolution and traceability needed to **implement solutions** (source-specific decision making)
- Provide a standardized and consistent **means to conduct risk-based assessment and prioritization of multiple emissions sources of multiple contaminants from multiple facilities**

ABSTRACT

Regional Air Impact Modeling Initiative (RAIMI)

The Regional Air Impact Modeling Initiative (RAIMI) is a unique methodology for determination of cumulative air pollution, cumulative health risk, and tracking air contaminants back to their source(s). The results facilitate focused cost-effective solutions. Historically, regulatory agencies, industry and communities have been limited in their ability to forecast cumulative risk and track air pollutants back to their source(s). The RAIMI is a "risk assessment-based" tool that enables one to evaluate the cumulative health impact on local communities of virtually an unlimited number of emission sources. The RAIMI's power lies in its ability to both predict potential risk to individual neighborhoods and differentiate from hundreds of pollution sources, to a few where attention will yield the greatest health benefit. In addition, results from the RAIMI are generated in a fully transparent fashion such that risk levels are traceable to each source, each exposure pathway (e.g. inhalation, ingestion), and each contaminant, allowing for prioritization of remedial action based on the potential impact of a contaminant, or source, on human health.

The RAIMI is a dynamic tool. As new or refined data become available, they can be directly incorporated into the assessment to obtain revised risk estimates on practically a real time basis. This allows for the rapid identification, characterization, assessment, and management of aggregate environmental exposures that may pose the greatest health risks to the public. A community assessment which would have been deemed impractical using older techniques can be completed relatively quickly using the RAIMI.

The RAIMI tool is comprised of a "how to" Users Guide, a compendium of methodologies and specifically designed software contained on a CD ROM. In application, emissions data from all known pollution sources in a particular area, both mobile (cars, buses) and stationary (factories, hospitals), are input to the RAIMI computer model, which calculates emission trajectories and deposition locations. The computer model then combines emissions data with local area land use and demographic data to estimate the potential for adverse human health impacts. Although attempted in the past by the Environmental Protection Agency and other organizations, to our knowledge this is the first successful application of human health risk assessment methodology on such a broad scale, at such a level of refinement as to allow neighborhoods to be differentiated and sources to be identified.

This readily transferable tool provides an unparalleled opportunity for citizens and the public and private sectors to assess and discuss potential impacts of all air-borne environmental releases and to collaborate on the state-of-the-environment and long-term land use planning.

RAIMI Tools

Data Miner - The Data Miner is a Graphical User Interface (GUI) that operates on a relational database platform and facilitates the assembly of multiple source emissions inventories for air and risk modeling. The Data Miner provides a user friendly format to allow for rapid, simple and complex, queries of large databases.

AMP - The Air Model Pre-processor (AMP) program automates the process of building input files for the ISCST3 air model. Key functions include: 1) quantifying source-specific site parameter (surface roughness, urban/rural land use) inputs to the ISCST3 air model, 2) pre-processing meteorological data required for air modeling through applying source-specific site parameters to run stage 3 of the Meteorological Processor for Regulatory Models (MPRM), and 3) auto-generating air model input files for multiple sources over a source centered universal grid including terrain elevations.

ISCBatch - The ISCBatch program was developed to allow a user to execute multiple air modeling runs using the ISCST3 air model in a batch run.

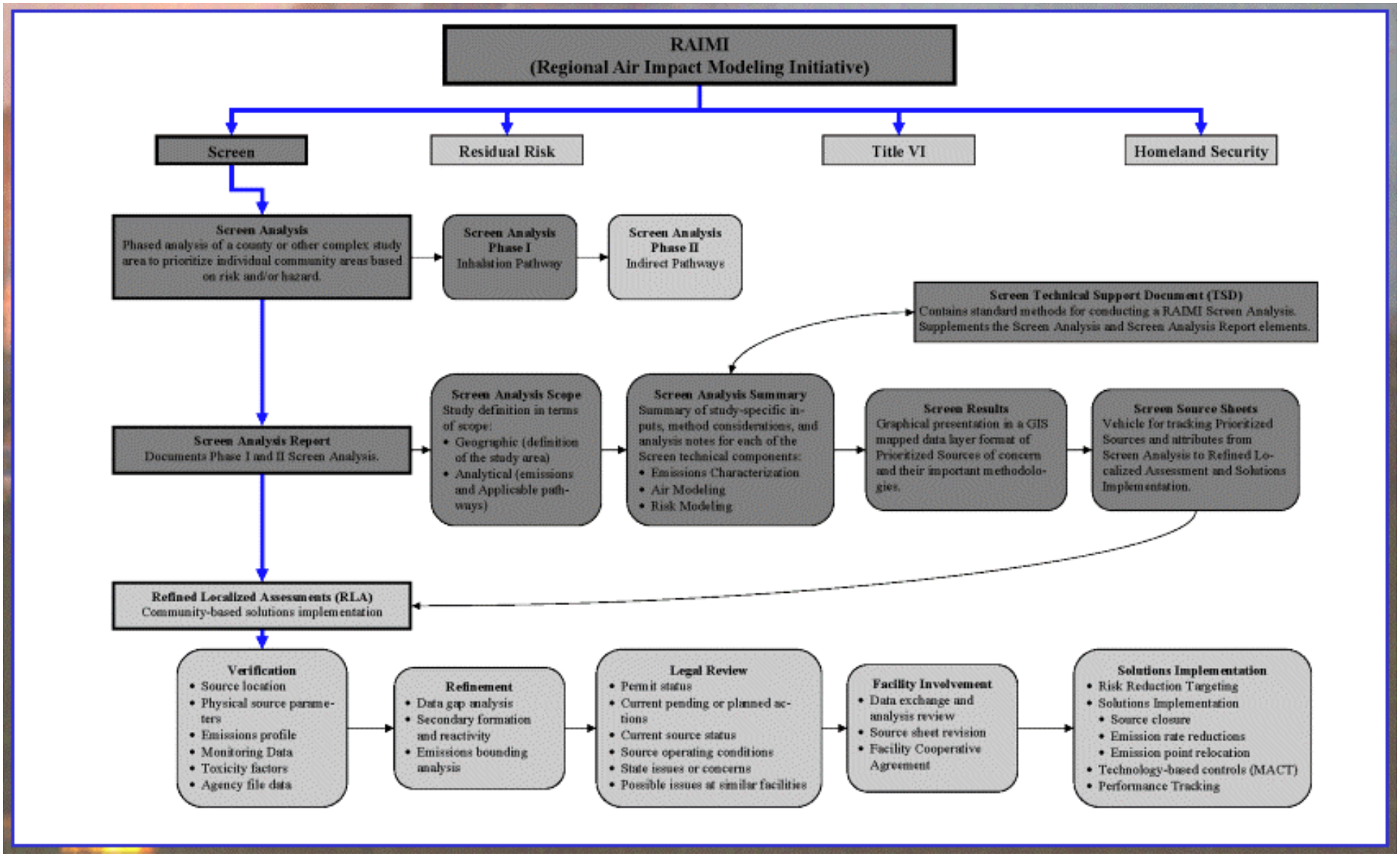
AIR2GIS - The AIR2GIS program consolidates the large plot file outputs from the ISCST3 air model into a single file for each source and formats the data for direct import into the Risk-Map program.

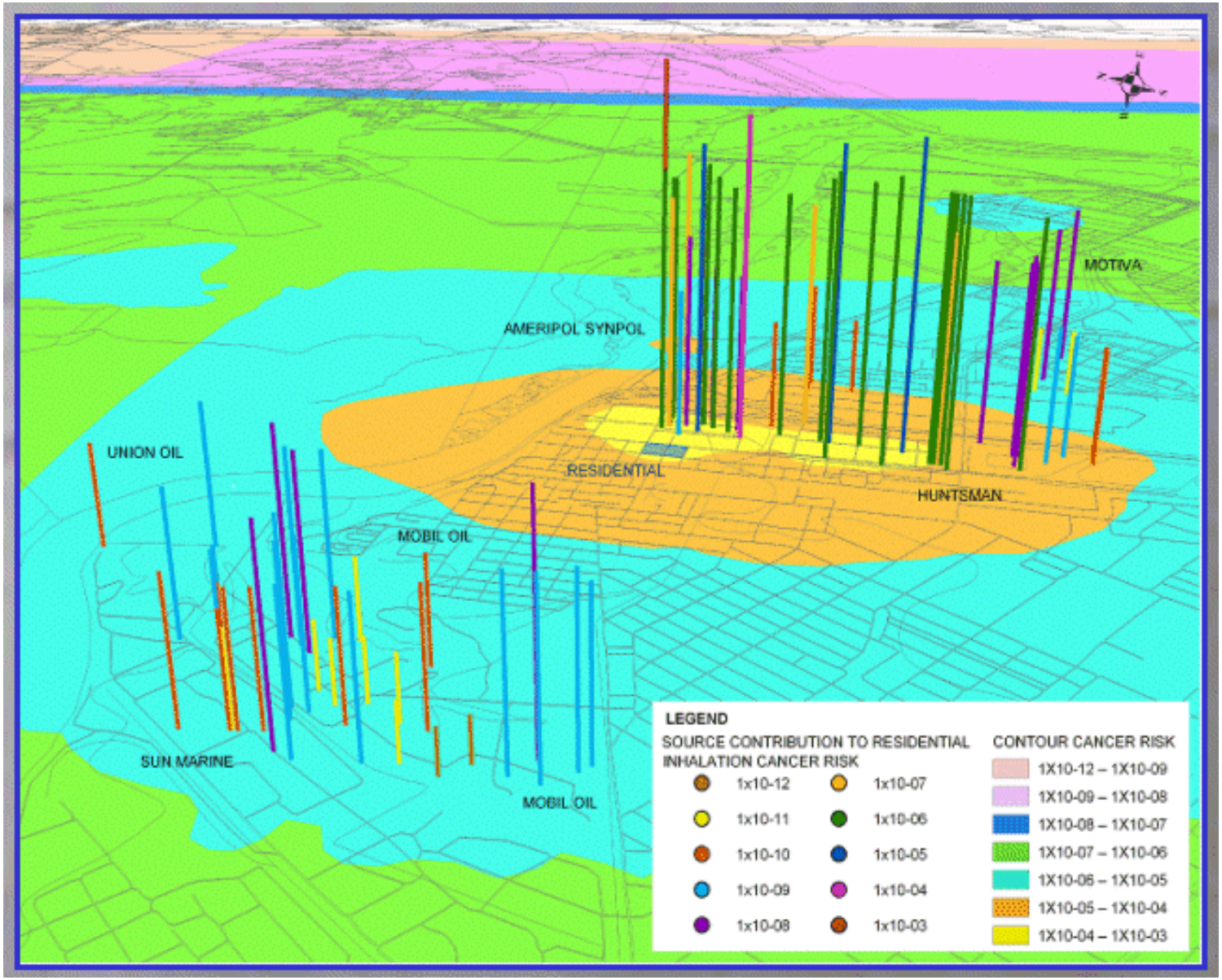
Risk-MAP - The Risk- Management and Analysis Platform (Risk-MAP) software is a fully integrated ArcView extension designed to work in concert with ArcMAP's expansive GIS mapping capabilities. Risk-MAP is a risk modeling and analysis tool developed to estimate potential human health impacts associated with exposure to chemicals from multiple emission sources and for multiple chemicals. The software allows the user to track potential health risks back to their source and follow/project results associated with emissions reduction strategies.

Additional Information

For additional information on RAIMI Tools or the RAIMI methodologies, contact Steve Thompson (thompson.steve@epa.gov) or Jeff Yurk (yurk.jeffrey@epa.gov), EPA Region 6 or via phone at 214-665-6775

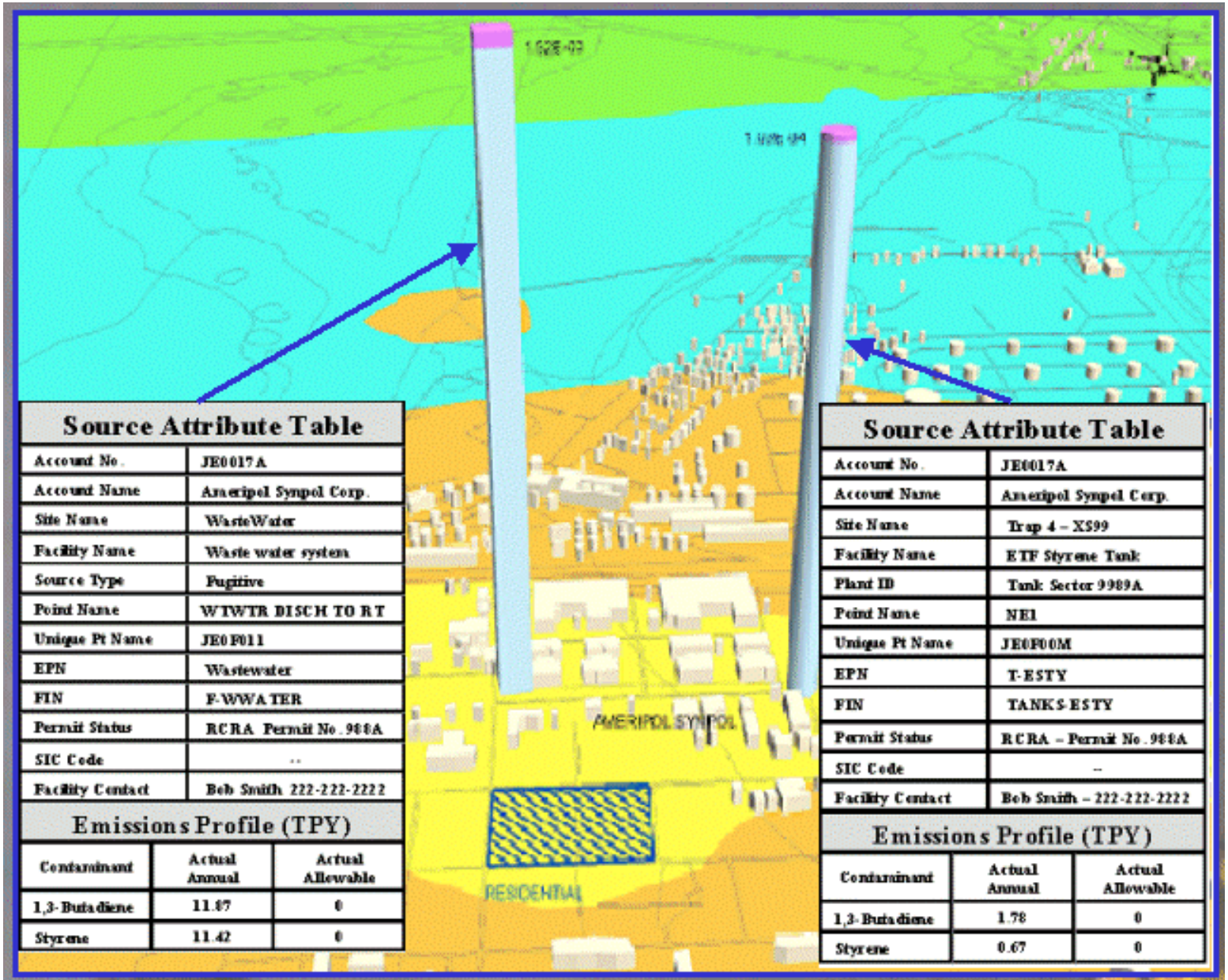
Website
http://www.epa.gov/earth1r6/6pd/rcra_c/raimi/raimi.htm


RAIMI
(Regional Air Impact Modeling Initiative)
Screen
Residual Risk
Title VI
Homeland Security
Screen Analysis
Phased analysis of a county or other complex study area to prioritize individual community areas based on risk and/or hazard.
Screen Analysis Phase I
Inhalation Pathway
Screen Analysis Phase II
Indirect Pathways
Screen Technical Support Document (TSD)
Contains standard methods for conducting a RAIMI Screen Analysis. Supplements the Screen Analysis and Screen Analysis Report elements.
Screen Analysis Report
Documents Phase I and II Screen Analysis.
Screen Analysis Scope
Study definition in terms of scope:
• Geographic (definition of the study area)
• Analytical (emissions and Applicable pathways)
Screen Analysis Summary
Summary of study-specific inputs, method considerations, and analysis notes for each of the Screen technical components:
• Emissions Characterization
• Air Modeling
• Risk Modeling
Screen Results
Graphical presentation in a GIS mapped data layer format of Prioritized Sources of concern and their important methodologies.
Screen Source Sheets
Vehicle for tracking Prioritized Sources and attributes from Screen Analysis to Refined Localized Assessment and Solutions Implementation.
Refined Localized Assessments (RLA)
Community-based solutions implementation
Verification
• Source location
• Physical source parameters
• Emissions profile
• Monitoring Data
• Toxicity factors
• Agency file data
Refinement
• Data gap analysis
• Secondary formation and reactivity
• Emissions bounding analysis
Legal Review
• Permit status
• Current pending or planned actions
• Current source status
• Source operating conditions
• State issues or concerns
• Possible issues at similar facilities
Facility Involvement
• Data exchange and analysis review
• Source sheet revision
• Facility Cooperative Agreement
Solutions Implementation
• Risk Reduction Targeting
• Solutions Implementation
  • Source closure
  • Emission rate reductions
  • Emission point relocation
• Technology-based controls (MACT)
• Performance Tracking



Risk Modeling Objectives (cont.)

- Provide **readily accessible** risk-based prioritization **tools and project platform designed to address multi-media solutions** to environmental problems
- **Calculate and track potential risks from hundreds of sources in a fully transparent manner**



Source Attribute Table

Account No.	JE0017A
Account Name	Ameripol Synpol Corp.
Site Name	WasteWater
Facility Name	Waste water system
Source Type	Fugitive
Point Name	WTWTR DISCH TO RT
Unique Pt Name	JE0F011
EPN	Wastewater
FIN	F-WWATER
Permit Status	RCRA Permit No. 988A
SIC Code	--
Facility Contact	Bob Smith 222-222-2222

Emissions Profile (TPY)

Contaminant	Actual Annual	Actual Allowable
1,3-Butadiene	11.87	0
Styrene	11.42	0

Source Attribute Table

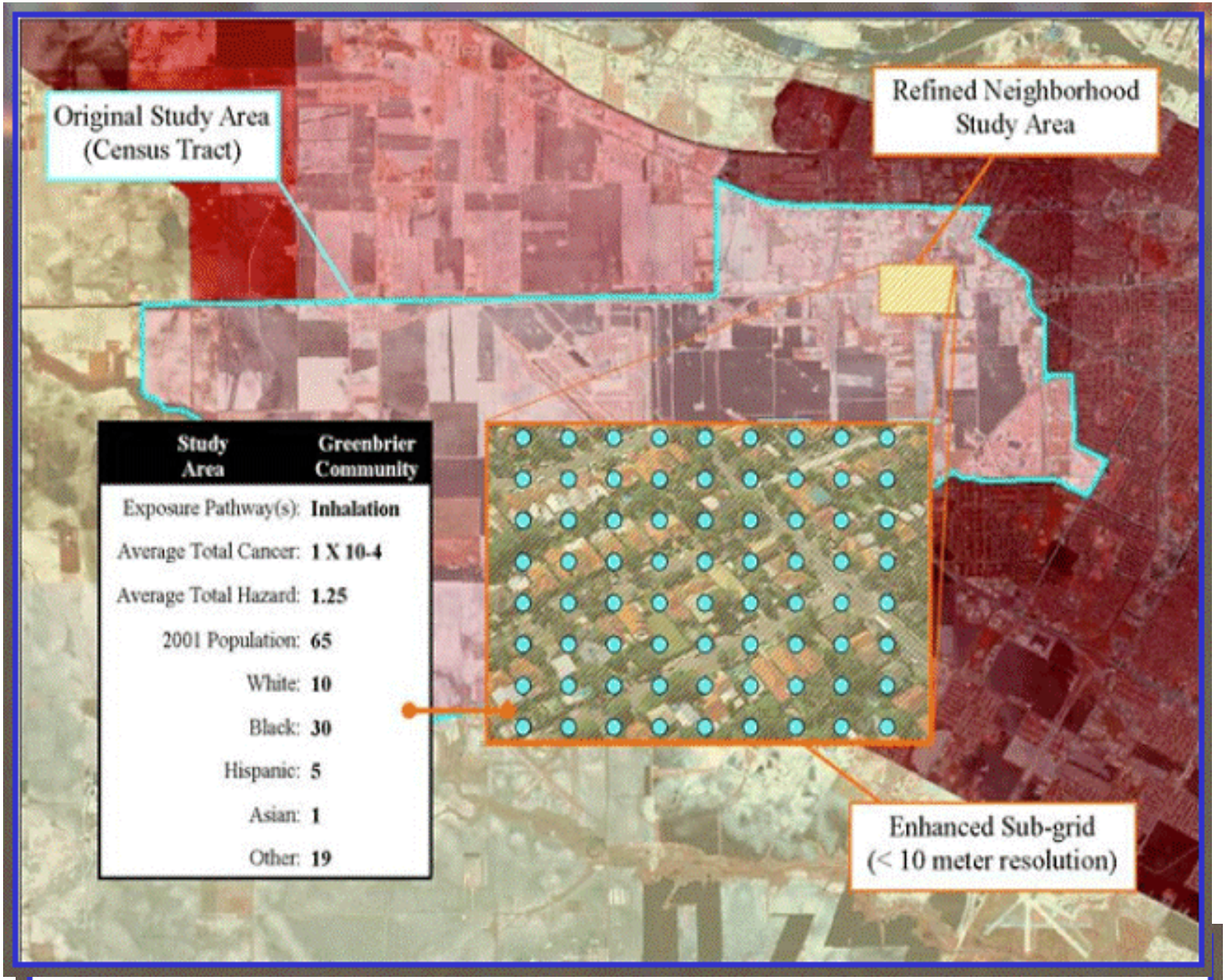
Account No.	JE0017A
Account Name	Ameripol Synpol Corp.
Site Name	Trap 4 – XS99
Facility Name	ETF Styrene Tank
Plant ID	Tank Sector 9989A
Point Name	NE1
Unique Pt Name	JE0F00M
EPN	T-ESTY
FIN	TANKS-ESTY
Permit Status	RCRA – Permit No. 988A
SIC Code	--
Facility Contact	Bob Smith – 222-222-2222

Emissions Profile (TPY)

Contaminant	Actual Annual	Actual Allowable
1,3-Butadiene	1.78	0
Styrene	0.67	0

Source Apportionment

A unique element of Risk-MAP is the capability of tracing risks back to the individual sources. The tool allows the user to identify the fraction of total risks or chemical specific risks for each individual source. This allows the risk manager to tailor risk management options to those specific units driving risks.



- Ability to perform risk and population averaging over extremely small areas (< 100 meters) using high-resolution (< 10 meters) sub-gridding capabilities
- Contains tools for averaging risk over user defined areas or existing census boundaries
- Area risk averages can be correlated to key population characteristics (i.e., sociodemographics)