Using GIS for Hazardous Materials Planning in Dallas County

Presented by

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Outline

- Background
  - Hazmat Planning Goals
  - Working with Facilities
  - Working with Jurisdictions

- Tools
  - Overview
  - Data Sources
  - CAMEO
  - MARPLOT

- Projects

West Fertilizer Explosion and Fire
April 17, 2013

Background: Hazmat Planning Goals

- Develop partnerships with local jurisdictions and facilities

- Address planning and resource gaps

- Create HAZMAT planning tools/documents

- Enhance understanding of HAZMAT threats

- Identify and share best practices

Background: Working with Facilities

- Site Visits
  - At the invitation of facilities
  - Connect with supervisors and managers
  - Coordinate with local fire department
- LEPC Participation
  - Invite managers and supervisor to speak and participate at meetings
  - Develop partnership with Dallas County OHSEM

Background: Working with Jurisdictions

- Meet and Greet
  - Addison, Balch Springs, Carrollton, Cedar Hill, Garland
  - Discuss HAZMAT related issues
  - Identify projects to work on (sometimes)
- Projects
  - Hazard Vulnerability Analysis – Addison
  - HAZMAT Table Top Exercise – Balch Springs
  - TIER II Facility Map – Cedar Hill

Tools: Overview

- Computer-Aided Management of Emergency Operation (CAMEO)
  - CAMEOfm – Reporting Facilities Database
  - ALOHA – Air Hazard Modeling
  - MARPLOT – Mapping
  - CAMEO Chemical – Chemical Reference
- GIS
  - R | Python – Data Cleaning, Exploratory and Descriptive Analysis, Mapping
  - QGIS | ArcMap – Geoprocesses, Map Layout and Publishing
- Report Design
  - Adobe InDesign
  - Adobe Illustrator

Tools: Data Sources

- TIER II Reports – Facilities with Reportable Quantities
- TCEQ
- OSHA
- EPA
- FEMA
- TEXAS EGRT
- CDC
- NCTCOG
- OpenStreetMap
- Local Open Data Portals

Tools: CAMEOfm

Tools: MARPLOT

Projects: TIER II Exploratory Data Analysis

Top 10 Extremely Hazardous Substances by Count

Projects: TIER II Exploratory Data Analysis

EHS Chemical Count by City
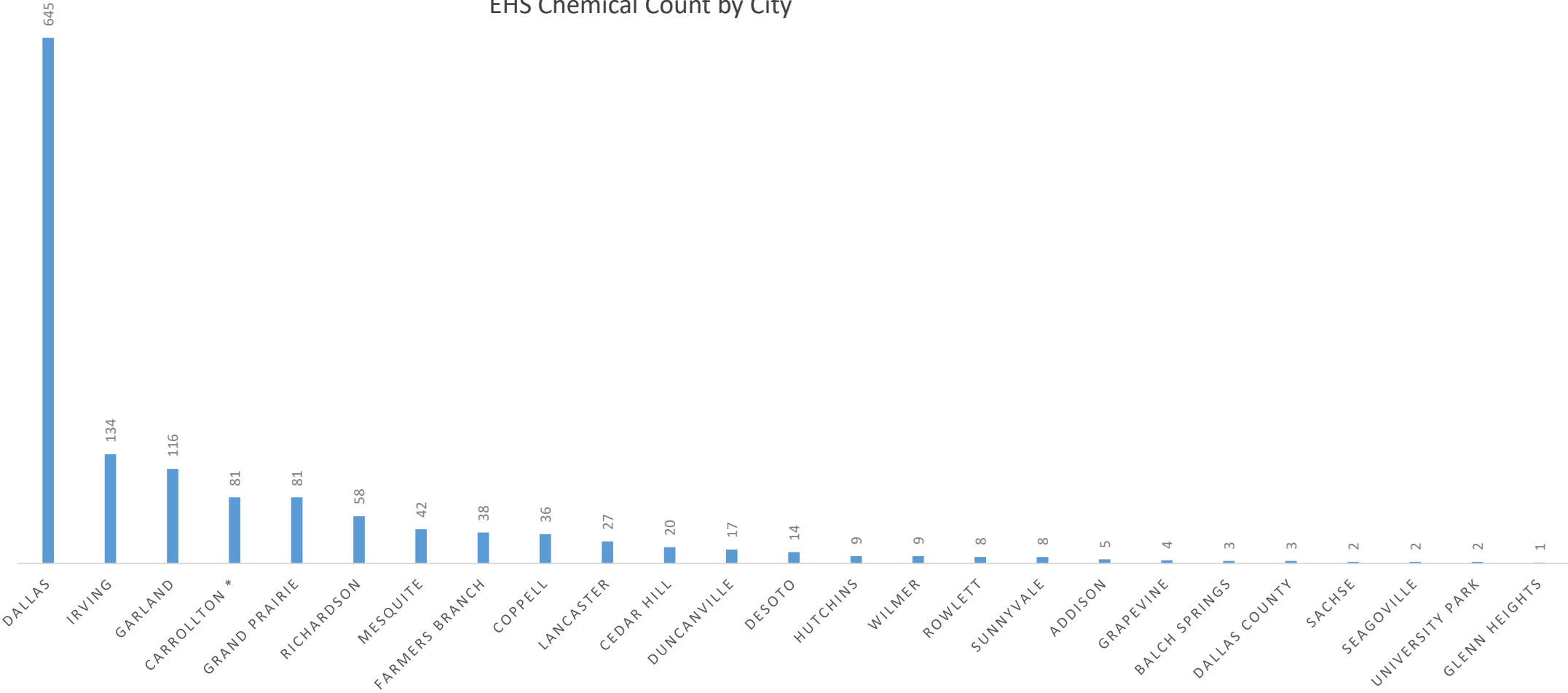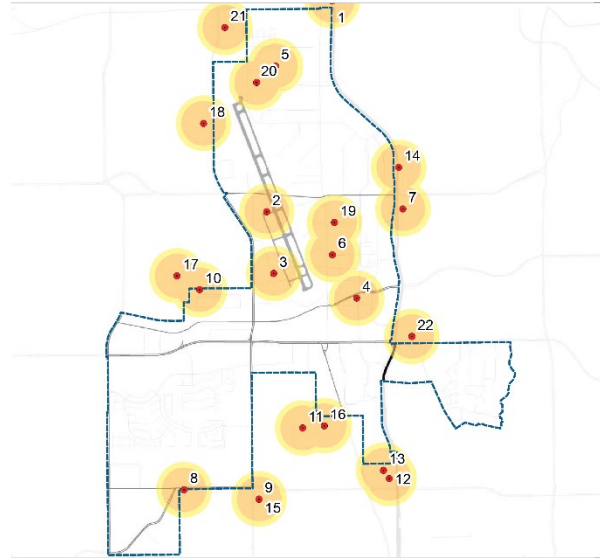
Projects: TIER II Exploratory Data Analysis

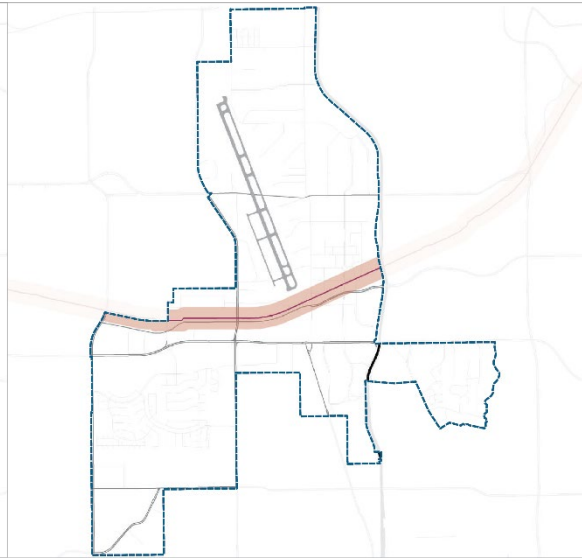Distribution of Top EHS Chemicals
for Dallas County (in Pounds)

Legend

■	10 - 5000
■	5001 - 15000
■	15001 - 30000
■	30001 - 60000
■	60001 - 120000
■	120001 - 240000
■	240001 - 480000
■	480001 - 749232
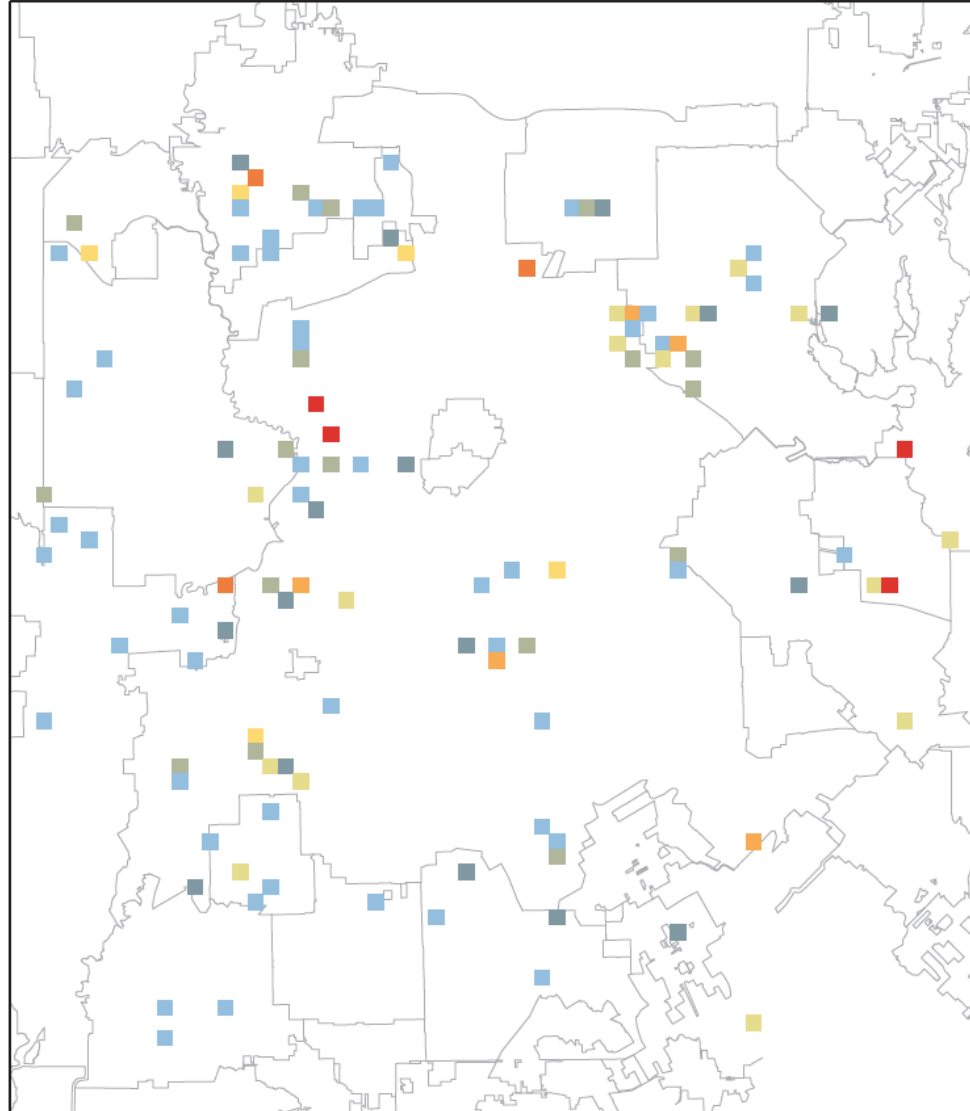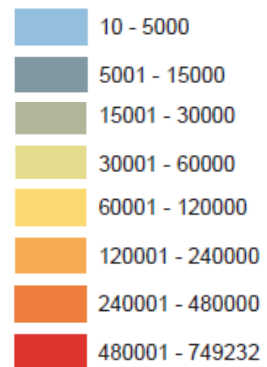
Projects: Hazardous Chemical Vulnerability Analysis

HAZARD ASSESSMENT: TIER II FACILITIES

HAZARD ASSESSMENT: PIPELINES

HAZARD ASSESSMENT: ROADWAYS
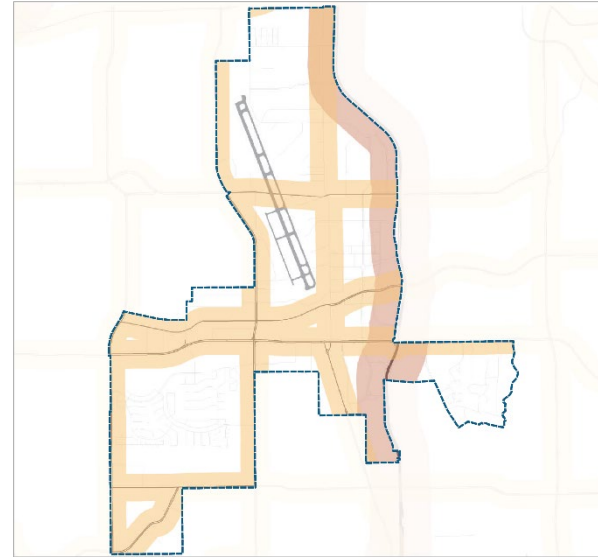
HAZARD ASSESSMENT: RAILWAYS
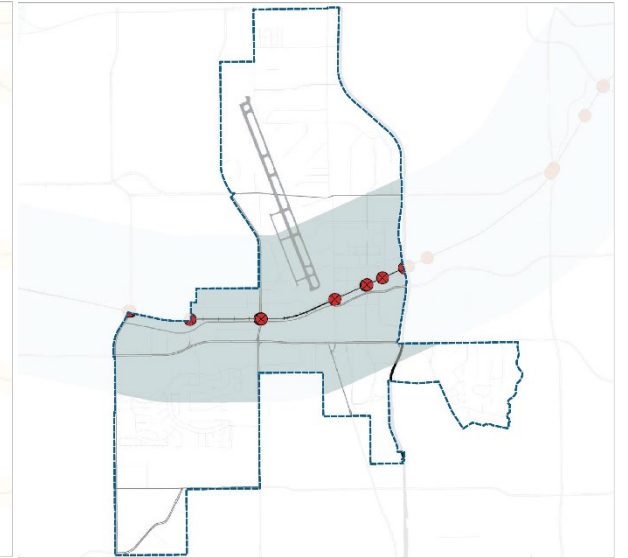
Projects: Preliminary Tank Farm Analysis

Map 3. ExxonMobil Fuel Terminal Half-Mile Buffer
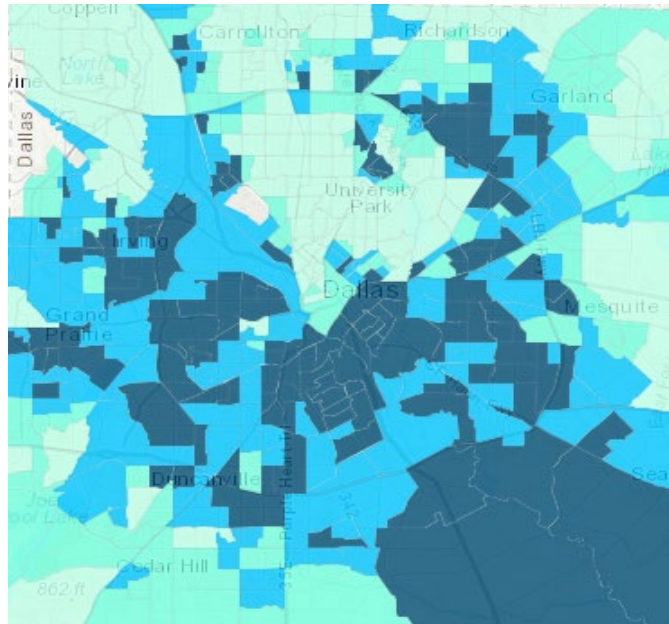
Map 5. Magellan Pipelines Fuel Terminal Half-Mile Buffer

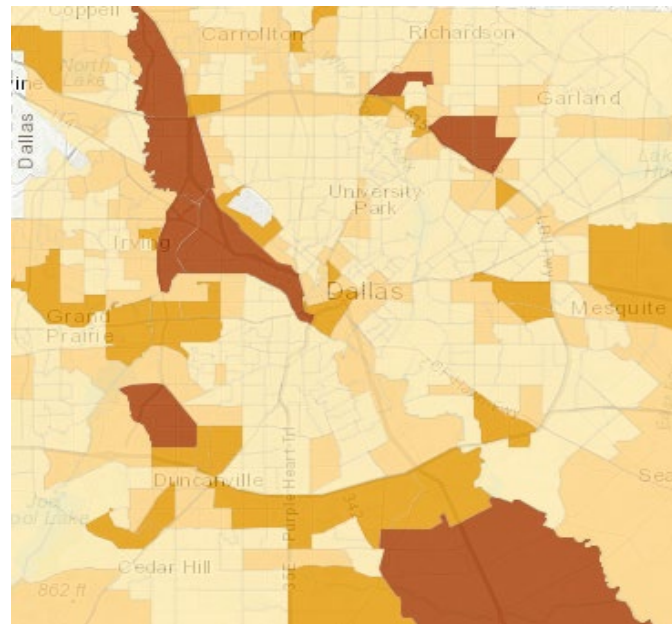Map 7. Motiva Enterprises Fuel Terminal Half-Mile Buffer
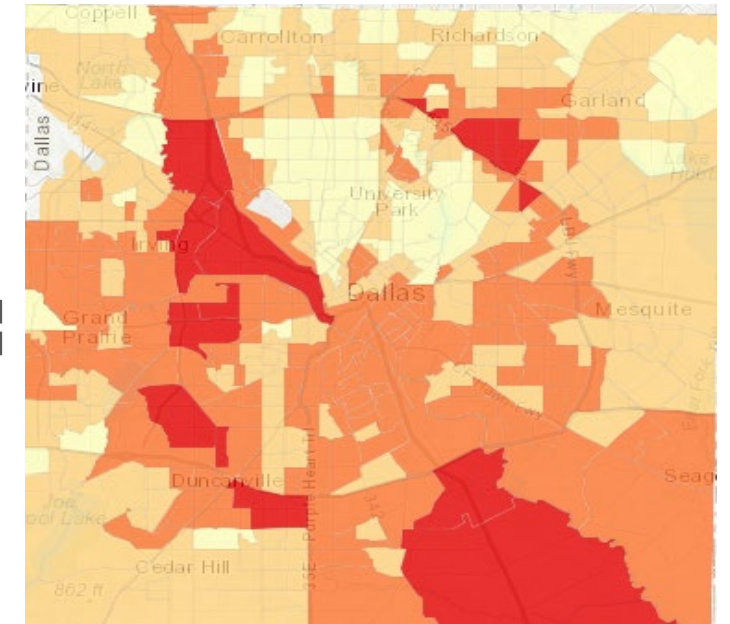
Projects: Cumulative Vulnerability Index

Social Vulnerability Index

Chemical Hazards

Cumulative Vulnerability

Projects: TCEQ Fines Web Map

Projects: TIER II Web Map

Projects: Site-Specific Reports

- Identified facilities storing large quantities of Ammonia and Chlorine – Selected top 10

- Purpose: Determine impact of potential chemical leak; coordinate with first responders; develop training exercises

- Organized by sections:
  - General Facility Information
  - Hazardous Chemical Information
  - Analysis of Initial Isolation Distances
  - Worst Case Scenarios
  - Emergency Notification

Bachman Water Treatment Plant
Hazardous Materials Management Plan

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Projects: Site-Specific Reports

Figure 1-1: Lone Star Cold Storage - Satellite Imagery

Projects: Site-Specific Reports

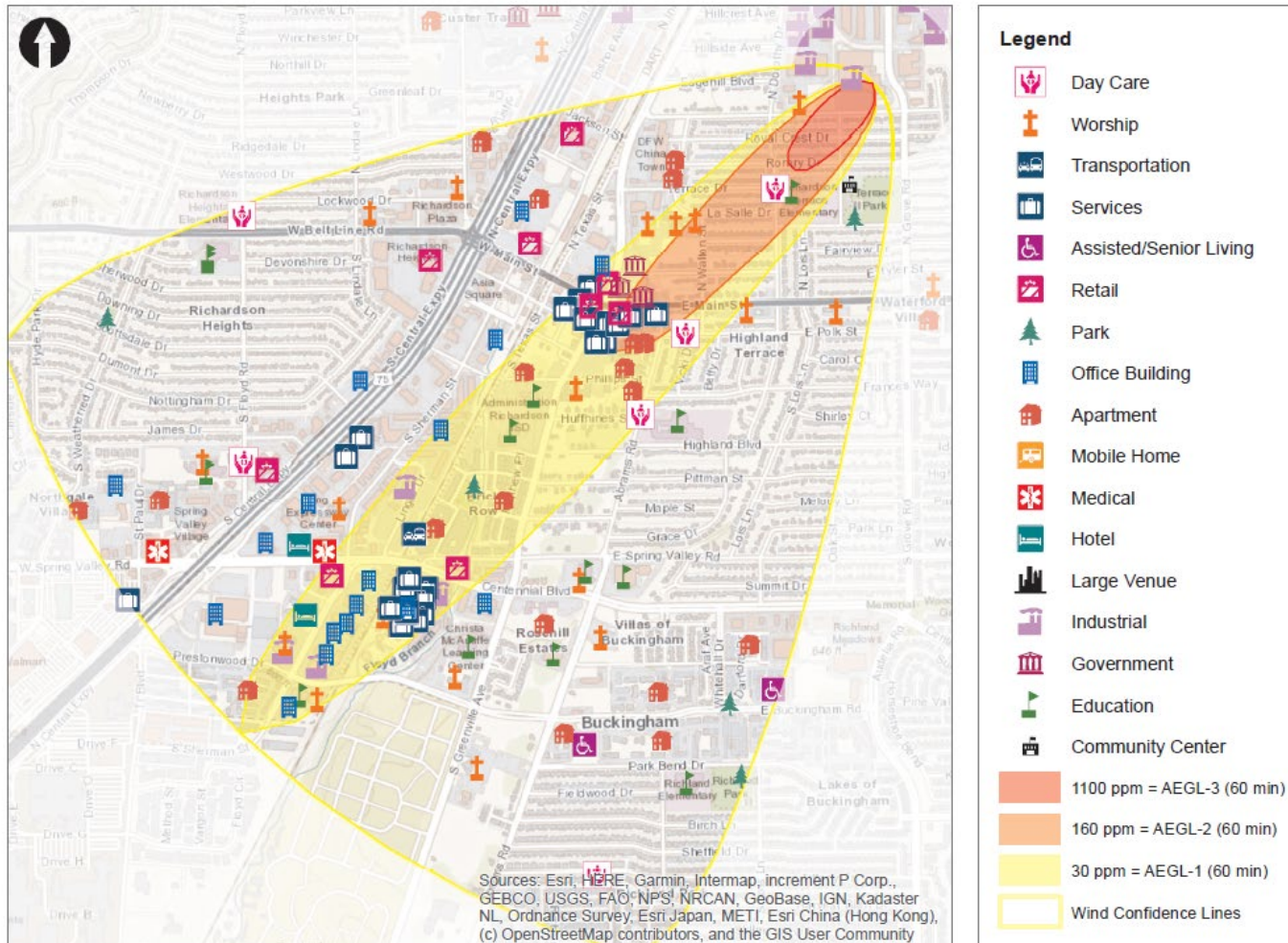Figure 3-1: Lone Star Cold Storage - Initial Isolation Area (1000 Feet)

Projects: Site-Specific Reports

Figure 3-2: Lone Star Cold Storage - Land Use

Projects: Site-Specific Reports

Figure 4-1: Lone Star Cold Storage - Anhydrous Ammonia Plume Dispersion Model

Questions/Comments ?

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