

June 22, 2022

Mr. Brian Albanese
Project Manager
DeKalb County School District

**Re: *Risk Hazard Analysis
Dresden Elementary School -2449 Dresden Drive, Chamblee, Georgia 30341
Matrix Engineering Group Project Number MEG-302765***

Mr. Brian:

Matrix Engineering Group, Inc. (Matrix) has completed a site Risk Hazard Assessment (RHA) for the Dresden Elementary School at 2449 Dresden Drive, Chamblee, Georgia 30341. Matrix followed the current Georgia Department of Education (GADOE) Facilities Services Unit document titled "Guide to School Site Selection". The GADOE requires that a hazard assessment be conducted if any of the hazards outlined within the GADOE document, within the specified radius of the proposed site, are identified. This report describes the hazards identified within the study area and presents the site risk hazard analysis to determine the potential impacts on occupants of the proposed school building.

INTRODUCTION

The subject site is located at 2449 Dresden Drive, Chamblee, Georgia 30341. According to the DeKalb County Tax Assessor's website and completed questionnaire, the subject site is 9.1 acres in size (Parcel ID14 1824505033) and is currently owned by DeKalb County School District.

The subject site is bound by Dresden Drive on the north, Dresden Way on the west, Power Line Easement on the south and commercial properties on the east. The original school building constructed in 1965, and subsequent classroom additions in 1967 and 1998, are located on the north portion of the subject site, along with the bus loop providing ingress and egress to for the Dresden Drive. A gymnasium building constructed in 1998, and play areas along with play structures, are located on the south portion of the site. Several mobile trailers and a storage building were noted near the southeast corner of the school building. The school building appeared to be constructed of structural masonry with slab-on-grade, basements and brick veneer. Covered concrete sidewalks were noted connecting the school building and the gymnasium building.

Based on the USGS topographic maps and our site visit, the topography slopes downward from maximum elevation of around 970 feet Mean Sea Level (MSL) along the east boundary, to building pad at elevation of around 960 feet MSL, and continue to slope down to 940 feet MSL at northwest corner and south corner of the site. The elevation change at the site is approximately 30 feet.

PROPERTIES SURROUNDING THE SCHOOL SITE

Surrounding properties consist primarily of residential and commercial use, as tabulated below:

Direction	Adjacent Properties	Surrounding Properties
North	Residential Properties	Residential Properties
South	Residential Properties	Educational Properties
East	Residential Properties	Residential Properties
West	Residential Properties	Commercial Properties

Significant landmarks within a mile radius include Interstate I85, DeKalb – Peachtree Airport, Dresden Park, North Fork Peachtree Creek, Mary Scott Nature Park, and St. Pius X Catholic High School.

HAZARDS IDENTIFICATION AND EVALUATION

A survey of hazards within a 3-mile radius of the subject site was performed in order to identify potential hazards that may impact the subject site. Sources of information for this work included, but are not limited to the Environmental Data Resources Inc. (EDR), National Pipeline Mapping System, US Energy Information Administration (EIA), Federal Emergency Management Agency (FEMA), US Department of Interior-Fish and Wildlife Service (FWS), Site reconnaissance, and Google Earth.

A site visit was made on June 10, 2022, to identify other hazards in the area (i.e. chemical plants, railroads, power lines, etc.) and to verify the information obtained from the various agencies. Table 1 below lists the hazards that were identified within the study area and the impact of each hazard on the subject site. Refer to the body of the report for further discussions regarding the potential impact.

TABLE 1: Survey of Hazards within the Minimum Search Radius (according to Georgia DOE Guidelines)

CATEGORY	LOCATED WITHIN MIN. SEARCH RADIUS		
	NO	YES	IMPACT/NOTES
1. Electrical Transmission Lines rated at 115kV or greater within 300 feet of the subject site.		X	Yes. Refer to Page 4 for analysis.
2. Oil or petroleum products transmission lines within 1 mile of the subject site	X		
3. Hazardous Chemical Pipelines within 1 mile of the subject site	X		
4. Natural gas transmission and distribution lines larger than ten inches in diameter with a pressure of 200 psi or more within 1 mile of the subject site	X		
5. Fuel facilities – gas stations within ½-mile of the subject site		X	Yes. Refer to Page 5 for analysis.
6. Propane storage facilities within 1 mile of the subject site	X		
7. Railroads within 1 mile of the subject site	X		
8. Major highways within ½ mile of the subject site		X	No. Refer to Page 7 for analysis.
9. Airport approaches or departure paths within 3 miles of the subject site		X	No. Refer to Page 9 for analysis.
10. Industrial/Manufacturing Facilities within 1 mile of the subject site	X		
a. Using or storing hazardous substances as defined under Title 40 CFR 262	X		
b. Emitting hazardous air pollutants as defined under the “Clean Air Act”	X		
c. Emitting hazardous air pollutants as defined under the 1990 “Clean Air Act Amendment” – Risk Management Plan Sec. 112(f)	X		
11. Lakes, rivers, dams, reservoirs, or other bodies of water	X		
12. Potential flooding because the property is located within the 100-year flood plain or dam breach zone	X		
13. Nuclear waste storage facilities within 3 miles of the subject site	X		

CATEGORY	LOCATED WITHIN MIN. SEARCH RADIUS		
	NO	YES	IMPACT/NOTES
14. Munitions or explosive storage or manufacturing within 3 miles of the subject site		X	No. Refer to Page 10 for analysis.
15. Landfills within ½ mile of the subject site		X	No. Refer to Page 10 for analysis.

The following paragraphs discuss assessment of the hazards that were identified within the minimum search radius of the project area, as specified in the Georgia Department of Education guidelines.

ELECTRICAL TRANSMISSION LINES

Electromagnetic Fields (EMF) and its possible human health effects are a concern for many people. To evaluate the potential risks of EMF, Matrix Engineering Group Inc.'s representatives reviewed publications by the Department of Engineering and public Policy of Carnegie Mellon University, the United States Environmental Protection Agency (EPA), the National Research Council, The New England Journal of Medicine, The American Cancer Society, and the American Medical Association. Electric and magnetic fields occur around electrical conductors such as power lines, household wiring, and appliances. Electrical fields result from the strength of the charge, while magnetic fields result from the motion of the charge. Hence, they are referred to as electromagnetic fields. The strength of EMF depends on the voltage of the object creating it and the distance away from that object. Electric fields are generally most intense around high voltage transmission lines.

In 1995, the American Physical Society (APS) spoke out on the question of power-line EMFs and health effects. The APS policy statement reads, in part: "The scientific literature and the reports of reviews by other panels show no consistent, significant link between cancer and power line fields. While it is impossible to prove that no deleterious health effects occur from exposure to any environmental factor, it is necessary to demonstrate a consistent, significant, and causal relationship before one can conclude that such effects do occur. From this standpoint, the conjectures relating cancer to power line fields have not been scientifically substantiated." (See APS Policy Statement 95.2 reaffirmed in 2005.)

The Health Physics Society (HPS), in a published article regarding high-voltage transmission lines, concluded that "there are no known health risks that have been conclusively demonstrated to be caused by living near high-voltage power lines. But science is unable to prove a negative, including

whether low-level EMFs are completely risk free. Most scientists believe that exposure to the low-level EMFs near power lines is safe, but some scientists continue research to look for possible health risks associated with these fields. If there are any risks such as cancer associated with living near power lines, then it is clear that those risks are small”.

The Georgia Department of Education Guidelines recommends that high power transmission lines be at least 300 feet from the portion of the site to be used for facilities or where students gather.

Based on a review of the Department of U.S. Energy maps as well as the aerial maps, a high voltage transmission power line, which is operated by GA Power, with voltage at 115Kv was identified along the southern boundary of the school property. Therefore, the Subject Site is within the impact zone of the high voltage power lines. Refer to Figure 5 in the Appendix for the location of the high voltage power lines.

FUEL FACILITIES

There are several fuel facilities located within 0.5 miles to the Subject Site along Buford Highway and Shallowford Road. The closest one is the Shell gas station at 2706 Shallowford Road NE, which is about 0.19 miles southeast to the subject site and is therefore selected for analysis.

ALOHA model was used to evaluate the hazard of exposure from an accident on the fuel facility. The analysis assumes that a leak occurs and the content of the tank empties for a period of time. The model assumes that a vapor cloud forms that originates from the vehicular source or container towards the site at an assumed wind speed (typically 10 to 30 miles per hour). The model allows modeling of various chemicals. The chemical properties are assigned by the ALOHA program. The program models various sources or accident scenarios, such as chemicals leaking from tanks; vertical for above storage tanks, horizontal for pipelines, or large transport vehicles or train containers. Accidents, such as leaks from a vertical tank or a horizontal pipeline can be modeled to determine the impact zone. Hazard conditions include direct source threat zone, overpressure (blast force), evaporating puddle, flammable area of vapor cloud, leaking from a hole, radiation from pool fire and fire ball. The program calculates distances of the Toxic Threat Zone, Flammable Threat Zone, Thermal Radiation Threat Zone from pool fire, Threat Zone from a fireball and Threat at a point for a specific designated downwind distance including outdoor and indoor concentrations of the modeled

chemical. The model displays a test summary that includes the assumed parameters and displays the model results. When applicable, the results are displayed on graphs showing the potential Threat Levels based on established Guideline of Exposure Limits, such as Acute Exposure Guidelines limits (AEGL-1, AEGL-2 and AEGL-3) with concentrations based on the type of gas modeled. Additionally, blast force from vapor cloud explosion (overpressure) is estimated at a point and evaluated based a 60-second blast force. The model also provides the outdoor and indoor concentration of the specific chemical modeled.

Benzene was selected for ALOHA modeling.

The model results were compared to the following criteria as appropriate:

- Threat Modeled: Toxic Area of Vapor Cloud: AEGL-1 (52 ppm), AEGL-2 (800 ppm), and AEGL-3 (4000 ppm)
- Threat Modeled: Flammable Area of Vapor Cloud: = 60% LEL (Flame Pockets= 6600 ppm) and 10% LEL (1100 ppm)
- Threat Modeled: Overpressure (blast force) from vapor cloud explosion, ignited by spark or flame
 - Destruction of buildings at a blast force of 8.0 psi
 - Serious injury likely at a blast force of 3.5 psi
 - Shatters glass at a blast force of 1.0 psi
- Threat Modeled: Thermal radiation from pool fire
 - Potentially lethal within 60 sec at 10.0 kW/(sq m)
 - Second degree burns within 60 sec at 5.0 kW/(sq m)
 - Pain within 60 sec at 2.0 kW/(sq m)
- Outdoor and Indoor Concentration: AEGL-1 for Benzene at 52 ppm.

The ALOHA test results are provided in the Appendix of this report. Based on the test results, the following is our findings:

- The Toxic Threat Zone distance for tank model were 654 yards, 76 yards, and 39 yards for AEGL-1 (52 ppm), AEGL-2 (400 ppm), and AEGL-3 (4000 ppm), respectively. **The subject site is located in the Toxic Threat Zone.**

- The Overpressure (blast force) from vapor cloud explosion was not exceeded and will not impact the subject site.
- The Flammable Area of Vapor Cloud of 60% LEL (Flame Pockets= 6600 ppm) and 10% LEL (1100 ppm) are 39 yards and 88 yards respectively. The subject site is not located in the Flammable Area.
- The Thermal Radiation Levels from a pool fire were 46 yards, 60 yards, and 85 yards for the 10.0 kW/sq.m, 5.0 kW/sq.m, and 2.0 kW/sq.m, respectively. The subject site is not within the impact distance.

Maximum Outdoor Concentrations were 84.1 ppm and Indoor Concentrations were at 38.2 ppm for toxic vapor cloud resulted from the accident on Shell gas station. The Maximum Outdoor Concentration is above levels for AEGL-1 for Benzene at 52 ppm. Refer to the recommendations section for general recommendations to mitigate outdoor/indoor potential presence of hazards in the atmosphere.

Based on our site reconnaissance, the location of the petroleum facility, and ALOHA model, *the subject site is located within the impact zone of a major accident on Shell gas station. Refer to the Hazard Risk Assessment Findings, Recommendations and Site Suitability Statement section on page 11 of this report for recommended mitigation measures.*

MAJOR ROADWAYS

Buford Highway is located approximately 0.25 mile northwest of the subject site; and Interstate I-85 is located approximately 0.29 mile southeast of the subject site. Tankers carrying gasoline products are likely to use the roadways to transport to nearby gas stations. Buford Highway is selected for modeling.

The **ALOHA** model was used to evaluate the hazard of exposure from an accident on Buford Highway. Since ALOHA does not model liquids, the analysis assumes that a leak occurs and the contents of the tank empties for a period of time. The model assumes that a vapor cloud forms that originates from the vehicular source or container towards the site at an assumed wind speed (typically 10 to 30 miles per hour). The model allows modeling of various chemicals. The chemical properties are assigned by the ALOHA program. The program models various sources or accident scenarios, such as chemicals leaking from tanks; vertical for above storage tanks, horizontal for pipelines, or

large transport vehicles or train containers. Accidents, such as leaks from a vertical tank or a horizontal pipeline can be modeled to determine the impact zone. Hazard conditions includes direct source threat zone, overpressure (blast force), evaporating puddle, flammable area of vapor cloud, leaking from a hole, radiation from pool fire and fire ball. The program calculates distances of the Toxic Threat Zone, Flammable Threat Zone, Thermal Radiation Threat Zone from pool fire, Threat Zone from a fireball and Threat at a point for a specific designated downwind distance including outdoor and indoor concentrations of the modeled chemical. The model displays a test summary that includes the assumed parameters and displays the model results. When applicable, the results are displayed on graphs showing the potential Threat Levels based on established Guideline of Exposure Limits, such as Acute Exposure Guidelines limits (AEGL-1, AEGL-2 and AEGL-3) with concentrations based on the type of gas modeled. Additionally, blast force from vapor cloud explosion (overpressure) is estimated at a point and evaluated based a 60-second blast force. The model also provides the outdoor and indoor concentration of the specific chemical modeled.

Benzene was selected for ALOHA modeling.

The model results were compared to the following criteria as appropriate:

- Threat Modeled: Toxic Area of Vapor Cloud: AEGL-1 (52 ppm), AEGL-2 (800 ppm), and AEGL-3 (4000 ppm)
- Threat Modeled: Flammable Area of Vapor Cloud: = 60% LEL (Flame Pockets= 6600 ppm) and 10% LEL (1100 ppm)
- Threat Modeled: Overpressure (blast force) from vapor cloud explosion, ignited by spark or flame
 - Destruction of buildings at a blast force of 8.0 psi
 - Serious injury likely at a blast force of 3.5 psi
 - Shatters glass at a blast force of 1.0 psi
- Threat Modeled: Thermal radiation from pool fire
 - Potentially lethal within 60 sec at 10.0 kW/(sq m)
 - Second degree burns within 60 sec at 5.0 kW/(sq m)
 - Pain within 60 sec at 2.0 kW/(sq m)
- Outdoor and Indoor Concentration: AEGL-1 for Benzene at 52 ppm.

The ALOHA test results are provided in the Appendix of this report. Based on the test results, the following is our findings:

- The Toxic Threat Zone distance for tank model were 423 yards, 50 yards, and 25 yards for AEGL-1 (52 ppm), AEGL-2 (400 ppm), and AEGL-3 (4000 ppm), respectively. The subject site is not located in the Toxic Threat Zone.
- The Overpressure (blast force) from vapor cloud explosion was not exceeded and will not impact the subject site.
- The Flammable Area of Vapor Cloud of 60% LEL (Flame Pockets= 6600 ppm) and 10% LEL (1100 ppm) are 25 yards and 57 yards respectively. The subject site is not located in the Flammable Area.
- The Thermal Radiation Levels from a pool fire were 46 yards, 60 yards, and 85 yards for the 10.0 kW/sq.m, 5.0 kW/sq.m, and 2.0 kW/sq.m, respectively. The subject site is not within the impact distance.

Maximum Outdoor Concentrations were 13.6 ppm and Indoor Concentrations were at 5.02 ppm for toxic vapor cloud resulted from the accident on Buford Highway. The Maximum Outdoor and Indoor Concentrations are below levels for AEGL-1 for Benzene at 52 ppm. Refer to the recommendations section for general recommendations to mitigate outdoor/indoor potential presence of hazards in the atmosphere.

Based on our site reconnaissance, the location of the petroleum facility, and ALOHA model, *the subject site is not located within the impact zone of a major accident on Buford Highway. Refer to the Hazard Risk Assessment Findings, Recommendations and Site Suitability Statement section on page 11 of this report for recommended mitigation measures.*

AIRPORT

The nearest airport is DeKalb Peachtree Airport located at 2000 Airport Road, Atlanta, Georgia 30041. The southeast border of the Airport is located approximately 0.42 miles from the subject site.

The DeKalb Peachtree Airport has two runways. Runway 34/16 is aligned in a Northwest to Southeast direction; and Runway 21/3 is aligned in a Northeast to Southwest direction. The runways are served by parallel taxiways to connect to the airport hangers and facilities.

Google maps were used to estimate the distances as well as the projection of the 3-mile airplanes path for approach and take-off. The DOE Guidelines states that the school site should not be in line with an airport runway within a 3-mile distance. Based on Google Maps measurements, the site is not directly in line with the runway. The site is located at an offset of approximately 0.3 miles north of the projected runway 34/16 alignment.

MUNITIONS OR EXPLOSIVE STORAGE

According to EDR Radius Report, several Formerly Used Defense Sites (FUDS) properties and Unexploded Ordnance (UXO) sites were located within 3 miles of the subject site, including the HILLTOP TRANSMITTAL SITE, NAS ATLANTA, I04GA097500 - MMRP/CWM, and CP GORDON in Chamblee, Georgia. Based on EDR records, these facilities were mainly used for training purposes and were closed in the 1940s and 1950s.

For the NAS ATLANTA site: The U.S. acquired approximately 408.71 acres for this site, which was later purchased by DeKalb County to build an airport. Between 1940 and 1953, the U.S. acquired land for use as a Naval Reserve aviation base, including DeKalb County Airport. The site was a complete pilot training base, including housing and support facilities. It was declared excess in 1958. In February 1960, a quitclaim deed conveyed the land and improvements to DeKalb County. The site is currently being used by the county as a general aviation facility known as DeKalb-Peachtree Airport. This property is known or suspected to contain military munitions and explosives of concern (e.g., unexploded ordnance) and therefore may present an explosive hazard.

Due to limited available information, it was assumed that the storage or manufacturing of explosives occurs at the west and north side of the airport, where most buildings are located. Based on USGS Maps, the buildings are at an approximate elevation of 940 to 1010 feet MSL, which is approximately 30 to 70 feet higher than that of the subject site. The area between the building and subject site is mostly developed with residential and commercial properties, and there is no direct line of sight. Therefore, it is our opinion that the impact of an explosion at the DeKalb-Peachtree Airport is unlikely to impact the subject site.

LANDFILL

According to EDR Radius Report, there was a Historical Landfill along Buford Highway that was about 0.386 miles north to northwest of the subject site. Based on EDR records, the landfill was a

public Unlined Sanitary Landfill that was now closed. The elevation of the Historical Landfill was approximately 951 feet MSL, which was on the close to the majority area of the subject site. A tributary of the North Fork Peachtree Creek was in between the Historical Landfill and the subject site. Based on the distance, topography, and hydrology features, the Historical Landfill is unlikely to impact the subject site.

RESPONDERS

One of the first responders will be the DeKalb County Fire Station 15, which is located approximately 1.15 miles northwest of the subject site at 2017 Flight Way Drive, Atlanta, GA 30341. Based on the location of the Fire Station, response to any major accident would be within a few minutes. Three additional fire stations are strategically located around the site, namely, DeKalb County Fire Station 19 located at 3253 Mercer University Drive, Atlanta, GA 30341 approximately 2.1 miles east of the subject site; DeKalb County Fire Station 2 located at 1316 Dresden Drive, Atlanta, GA 30341, approximately 2.53 miles west of the subject site; and DeKalb County Fire Station 8 located at 2711 Clairmont Road, Atlanta, GA 30329 approximately 2.56 miles southwest of the subject site.

Per previous discussions with the Fire Department, response to a subject site would be approximately 5 minutes. Assistance by the neighboring fire stations will be available on an as needed basis and their response time is approximately 6 to 10 minutes for the project site. These Fire Stations are equipped with Engine 15, 2, 8, and 19, Crash 15, Battalion 1 and HAZMAT 19. If an accident occurs at the site or in the vicinity of the site, then the first responder would consist of DeKalb County Fire Station 15, 19, 2 and 8. If additional help is needed, it would be provided by the neighboring localities.

Based on the locations of the fire station with respect to the subject site, it is our opinion that adequate facilities should be available in the event of a major accident.

HAZARD RISK ASSESSMENT CONCLUSION AND RECOMMENDATIONS

The potential hazards that were identified within the minimum GADOE evaluation radius from the site included high voltage power transmission line, fuel facilities, major roadways, airports, munitions or explosive storage, and landfill. The foremost concern associated with the majority of these hazards would be by accidental causes on the fuel facilities and major roadways. The probability of such accidents occurring is highly dependent upon several factors, including weather conditions and

the human element and is therefore difficult, if not impossible, to predict. For this reason, we have not attempted to evaluate probabilities but have focused instead on the facts and availability of potential responders in most cases.

CONCLUSIONS

1. Based on our site reconnaissance, ***the southern area of the subject site is located within the impact zone of a high voltage electrical transmission line. The GA DOE requires that the proposed development should be located greater than 300 feet from the transmission lines and be fenced off to limit access to students.***
2. Based on our site reconnaissance, the location of the fuel facility, and the ALOHA model, ***the subject site is located within the impact zone of a major accident on the fuel facility.***
3. Based on our site reconnaissance, the location of the major roadway, and the ALOHA model, ***the subject site is not located within the impact zone of a major accident along Buford Highway.***
4. Based on our site reconnaissance, the location, the distance and the alignment of the airport runway, ***subject site is not located within the impact zone of accidents along the airport runway.***
5. Based on our site reconnaissance, the location, the distance, ***subject site is not located within the impact zone of accidents from the munitions and explosive storage facilities.***
6. Based on our site reconnaissance, the location, the distance and topography and hydrology features, ***subject site is not located within the impact zone of the Historical Landfill.***

RECOMMENDATIONS

Based on the information gathered in this study and our analysis, the site appears to be inside the zone of direct impact of a major accident on the high voltage power transmission line and fuel facilities. Based on the DOE guidelines, we recommend the school board incorporate the following measures into the planning and design of the school building:

1. The proposed development on the south area of the site should meet the minimum requirements of 300 feet away from the high voltage transmission power lines. Access to students should be limited with a fence.
2. Prepare an emergency preparedness plan to address the potential hazards referenced in this report.

3. Prepare an evacuation plan consistent with the type of hazard identified to provide for efficient and timely evacuation of the buildings in case of an emergency.
4. Install fencing at the perimeter of the school building and facilities to restrict students from leaving and to limit access to school site.
5. Design of air handling and ventilation systems should incorporate engineering controls to prevent intrusion of hazardous airborne contaminant (i.e. shut-off system, detection devices, and control air circulation and purging of contaminant from the building envelope).

Based on the Hazard Risk Analysis and our Evaluation for the Dresden Elementary School, it is our opinion that the subject site is suitable for the proposed development provided that the mitigation measures recommended in this report are incorporated into the design and operation of the school facility.

Matrix Engineering Group, Inc. appreciates the opportunity of working with you on this project and look forward to our continued association. If you have any questions concerning this report, please contact us.

Yours truly,
MATRIX ENGINEERING GROUP, INC.



Qinghe Lou, PE
Project Engineer



Sam Alyateem, PE
Principal

M:\1.0 MATRIX PROJECTS FOLDER\Dresden Elementary School (DeKalb Co. Schools)\1.0 ENVIRONMENTAL - MEG 302765\RHA\report\Dresden ES Risk Hazard Analysis Report.doc

APPENDIX

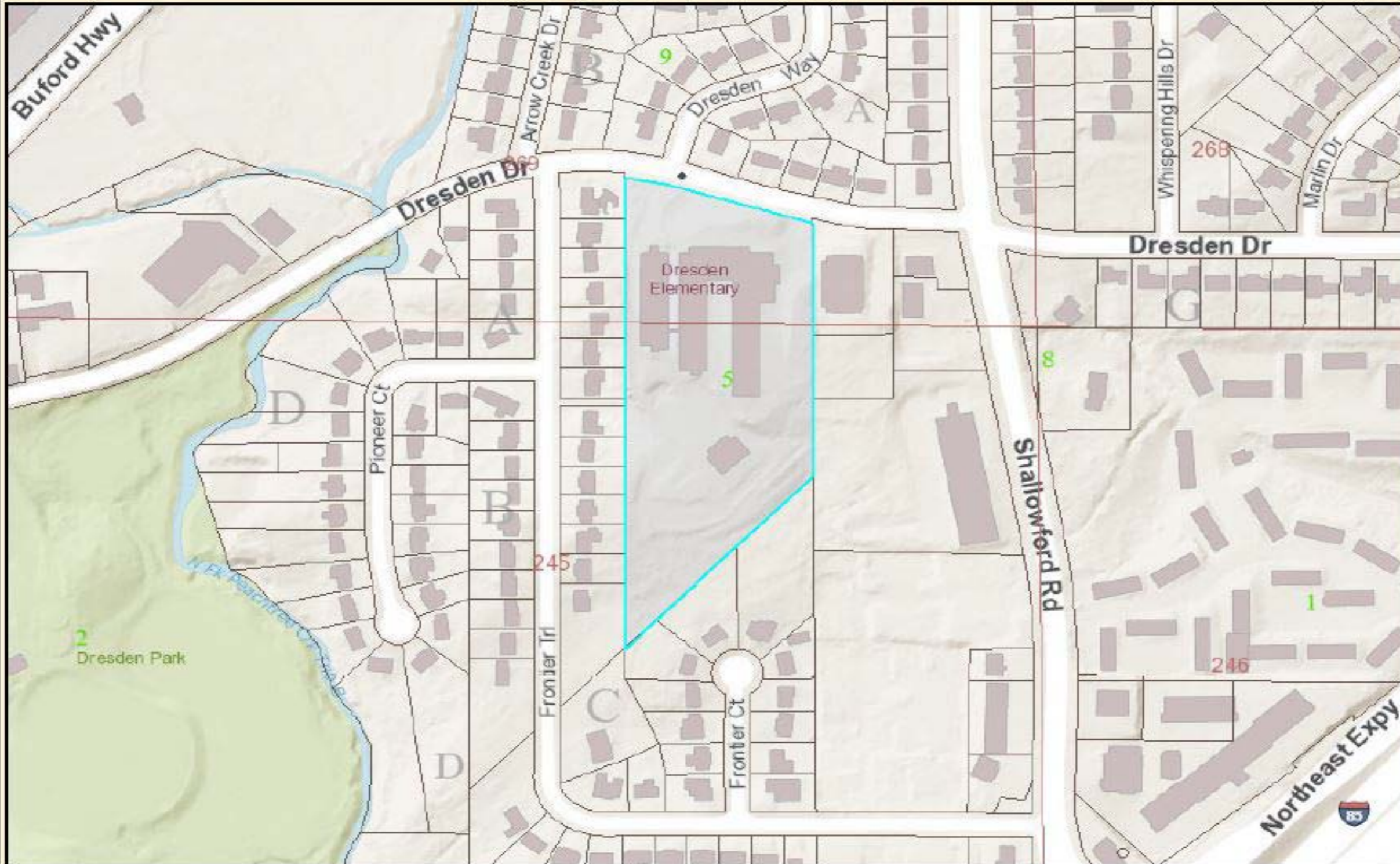
SITE LOCATION MAP

3-MILE RADIUS HAZARDS MAP

NATIONAL FLOOD HAZARD MAP

NATIONAL WETLANDS INVENTORY MAP

ALOHA MODELING



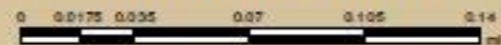
**Matrix
Engineering
Group, Inc.**

engineers | special inspectors | construction consultants

TITLE	SITE LOCATION
PROJECT	DRESDEN ELEMENTARY SCHOOL
PROJECT NUMBER	MEG302765
CLIENT	DEKALB COUNTY SCHOOL DISTRICT
SCALE	NTS
REVIEWED	SAM ALYATEEM, PE
DATE	6/16/2022
FIGURE	1
LEGEND	



DeKalb County Parcel Map

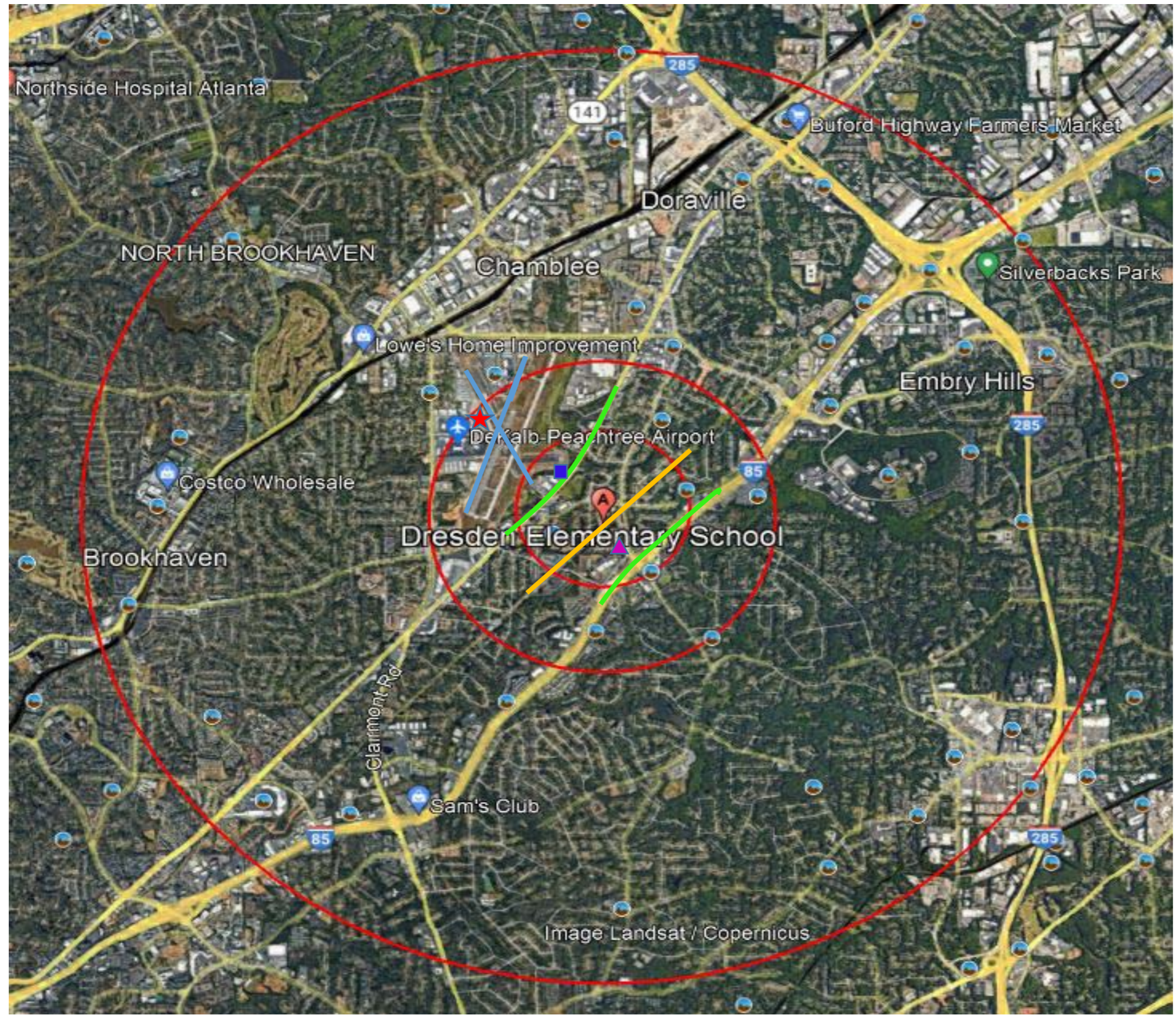


Date Printed: 6/16/2022



DeKalb County GIS Disclaimer

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**Matrix
Engineering
Group, Inc.**

engineers | special inspectors | construction consultants

TITLE	HAZARDS IDENTIFIED WITHIN 3-MILE RADIUS
PROJECT	DRESDEN ELEMENTARY SCHOOL
PROJECT NUMBER	MEG302765
CLIENT	DEKALB COUNTY SCHOOL DISTRICT
SCALE	NTS
REVIEWED	SAM ALYATEEM, PE
DATE	6/16/2022
FIGURE	2

LEGEND	<ul style="list-style-type: none"> ■ Landfill — Powerline — Major Roadways — Airport Runways ★ Munitions or Explosive Storage ▲ Fuel Facility
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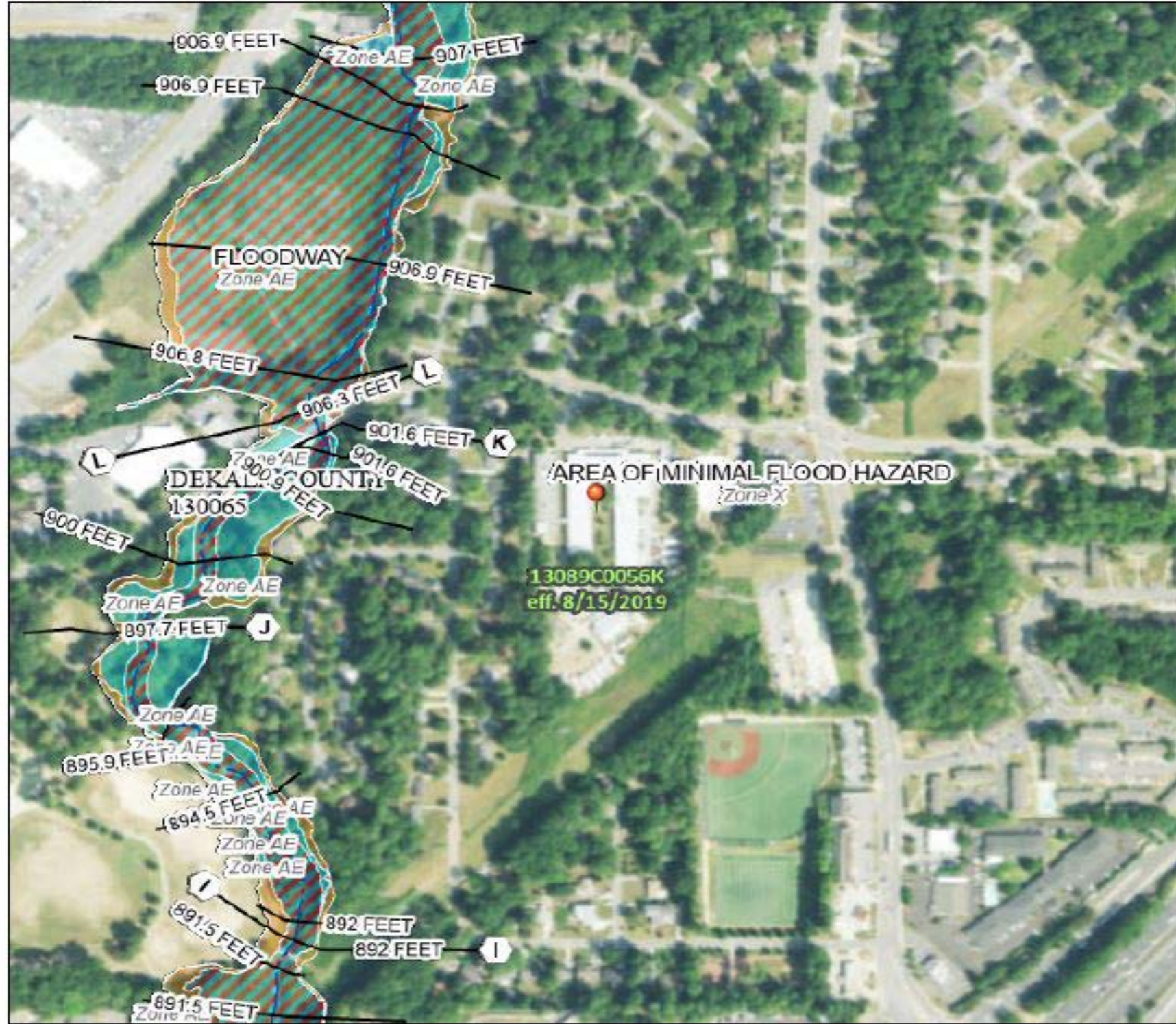


Image Landsat / Copernicus

National Flood Hazard Layer FIRMette



84°17'51"W 33°52'25"N



0 250 500 1,000 1,500 2,000 Feet 1:6,000
 Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AD, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5 Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
		Profile Baseline
	Hydrographic Feature	
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 6/8/2022 at 9:41 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.



Matrix Engineering Group, Inc.

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TITLE	FLOOD MAP
PROJECT	DRESDEN ELEMENTARY SCHOOL
PROJECT NUMBER	MEG302765
CLIENT	DEKALB COUNTY SCHOOL DISTRICT
SCALE	NTS
REVIEWED	SAM ALYATEEM, PE
DATE	6/16/2022
FIGURE	3
LEGEND	



U.S. Fish and Wildlife Service
National Wetlands Inventory

Wetlands



Matrix Engineering Group, Inc.

engineers | special inspectors | construction consultants



June 8, 2022

Wetlands

- | | | |
|--------------------------------|-----------------------------------|----------|
| Estuarine and Marine Deepwater | Freshwater Emergent Wetland | Lake |
| Estuarine and Marine Wetland | Freshwater Forested/Shrub Wetland | Other |
| | Freshwater Pond | Riverine |

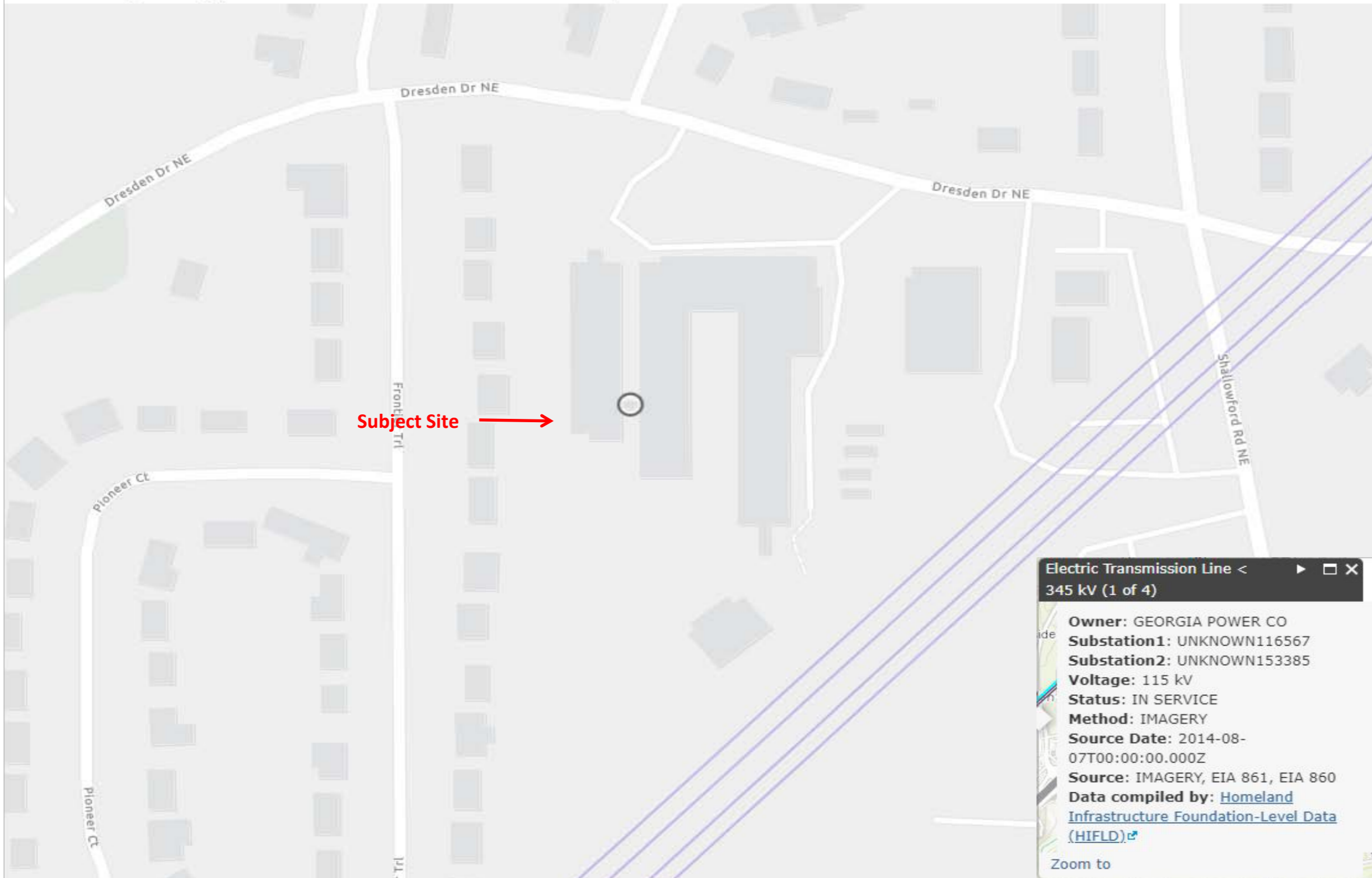
This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

TITLE	WETLANDS MAP
PROJECT	DRESDEN ELEMENTARY SCHOOL
PROJECT NUMBER	MEG302765
CLIENT	DEKALB COUNTY SCHOOL DISTRICT
SCALE	NTS
REVIEWED	SAM ALYATEEM, PE
DATE	6/16/2022
FIGURE	4

LEGEND

Electricity Energy Infrastructure and Resources Map



Electric Transmission Line < ▶ □ ✕
345 kV (1 of 4)

Owner: GEORGIA POWER CO
Substation1: UNKNOWN116567
Substation2: UNKNOWN153385
Voltage: 115 kV
Status: IN SERVICE
Method: IMAGERY
Source Date: 2014-08-07T00:00:00.000Z
Source: IMAGERY, EIA 861, EIA 860
Data compiled by: [Homeland Infrastructure Foundation-Level Data \(HIFLD\)](#)
 Zoom to



Matrix Engineering Group, Inc.

engineers | special inspectors | construction consultants

TITLE	POWERLINE MAP
PROJECT	DRESDEN ELEMENTARY SCHOOL
PROJECT NUMBER	MEG302765
CLIENT	DEKALB COUNTY SCHOOL DISTRICT
SCALE	NTS
REVIEWED	SAM ALYATEEM, PE
DATE	6/21/2022
FIGURE	5
LEGEND	



Toxic Threat Zone

ALOHA® 5.4.7

Time: June 10, 2022 1041 hours EDT (using computer's clock)

Chemical Name: BENZENE
Carcinogenic risk - see CAMEO Chemicals

Wind: 12 miles/hour from SE at 3 meters

THREAT ZONE:

Model Run: Gaussian

Red : 39 yards --- (4000 ppm = AEGL-3 [60 min])

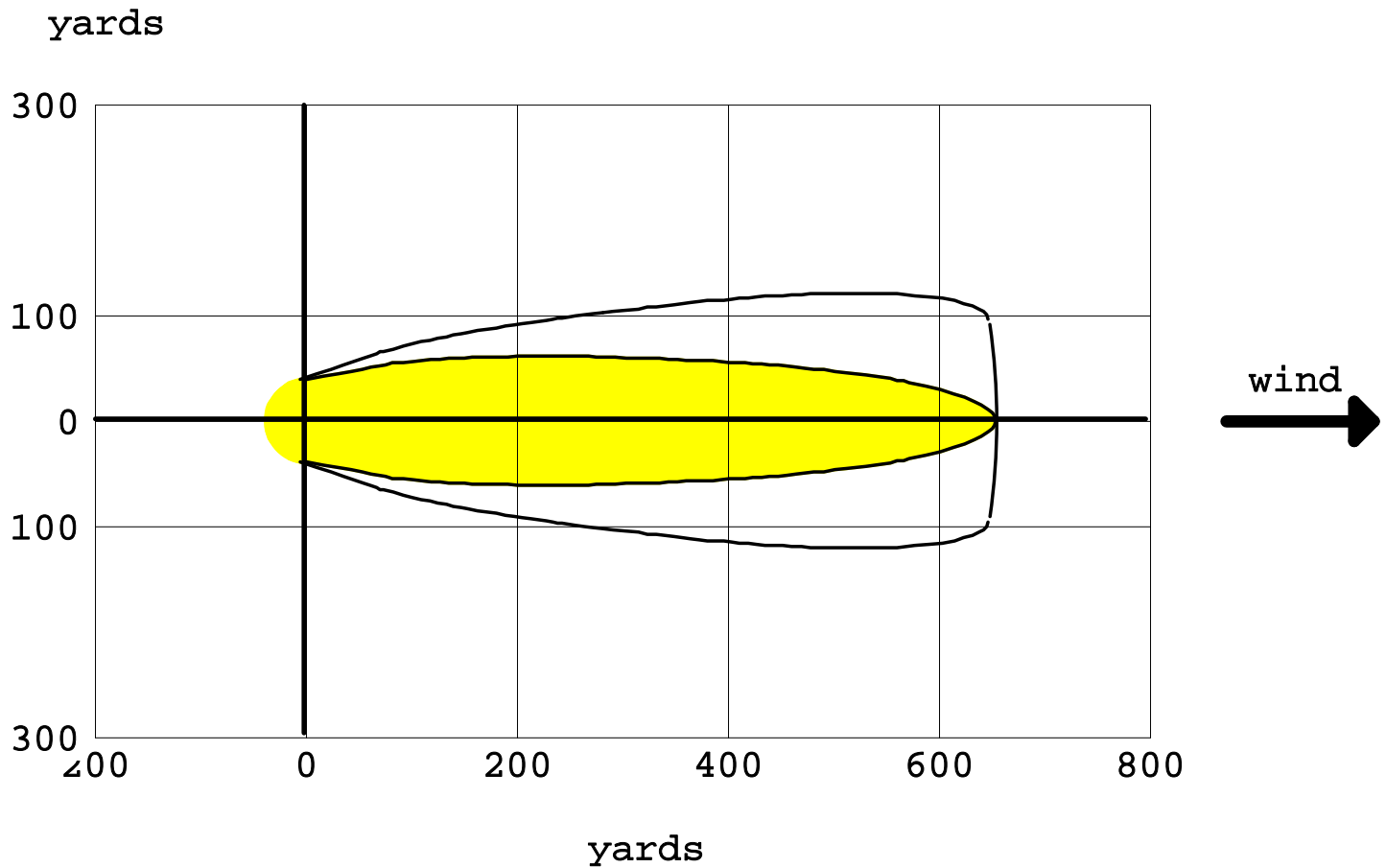
Note: Threat zone was not drawn because effects of near-field patchiness make dispersion predictions less reliable for short distances.





Orange: 76 yards --- (800 ppm = AEGL-2 [60 min])

Note: Threat zone was not drawn because dispersion predictions are unreliable for lengths less than the maximum diameter of the puddle.

Maximum diameter of the puddle: 78 yards

Yellow: 654 yards --- (52 ppm = AEGL-1 [60 min])



-  greater than 4000 ppm (AEGL-3 [60 min]) (not drawn)
-  greater than 800 ppm (AEGL-2 [60 min]) (not drawn)
-  greater than 52 ppm (AEGL-1 [60 min])
-  wind direction confidence lines

Source Strength (Evaporation Rate)

ALOHA® 5.4.7



Time: June 10, 2022 1309 hours EDT (using computer's clock)

Chemical Name: BENZENE

Carcinogenic risk - see CAMEO Chemicals

SOURCE STRENGTH:

Leak from hole in horizontal cylindrical tank

Flammable chemical escaping from tank (not burning)

Tank Diameter: 16 feet

Tank Length: 16 feet

Tank Volume: 24,065 gallons

Tank contains liquid

Internal Temperature: 80° F

Chemical Mass in Tank: 87.5 tons

Tank is 100% full

Circular Opening Diameter: 0.5 feet

Opening is 8.00 feet from tank bottom

Ground Type: Default soil

Ground Temperature: equal to ambient

Max Puddle Diameter: Unknown

Release Duration: ALOHA limited the duration to 1 hour

Max Average Sustained Release Rate: 1,540 pounds/min

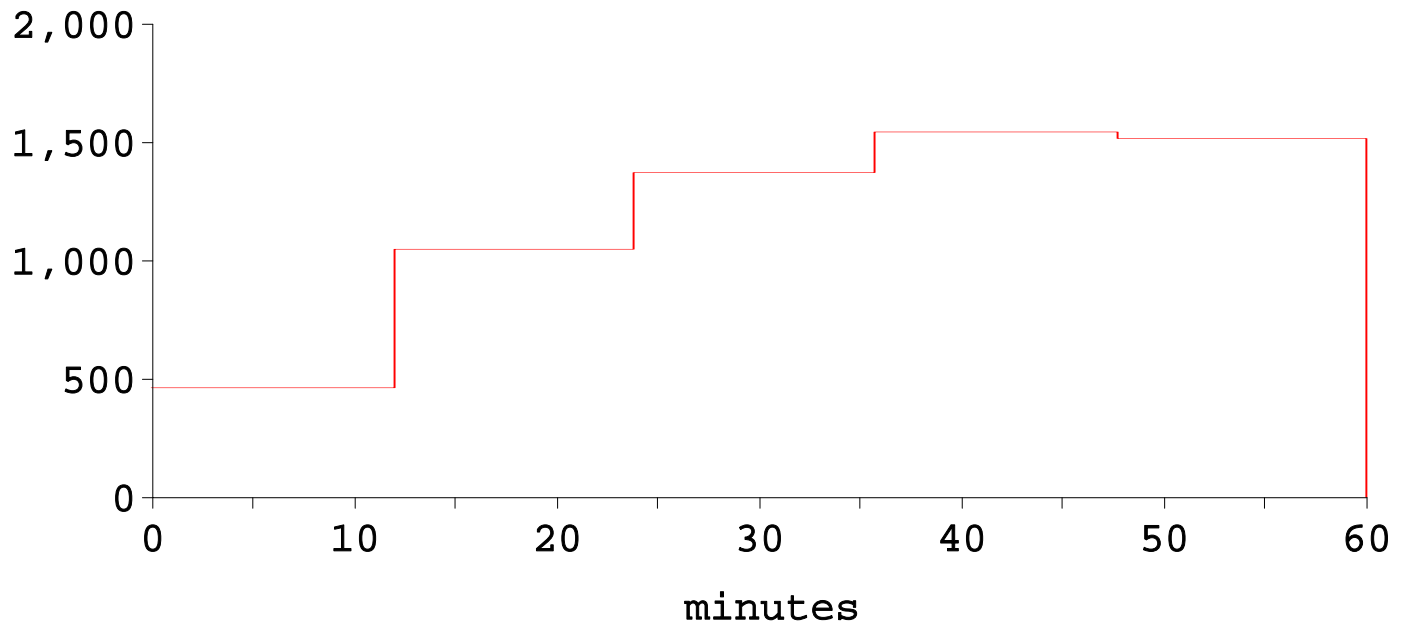
(averaged over a minute or more)

Total Amount Released: 71,333 pounds

Note: The chemical escaped as a liquid and formed an evaporating puddle.

The puddle spread to a diameter of 78 yards.

pounds/minute



Overpressure (Blast Force) Threat Zone

ALOHA® 5.4.7



Time: June 10, 2022 1309 hours EDT (using computer's clock)

Chemical Name: BENZENE

Carcinogenic risk - see CAMEO Chemicals

Wind: 12 miles/hour from SSE at 3 meters

THREAT ZONE:

Threat Modeled: Overpressure (blast force) from vapor cloud explosion

Type of Ignition: ignited by spark or flame

Level of Congestion: uncongested

Model Run: Gaussian

No explosion: no part of the cloud is above the LEL at any time

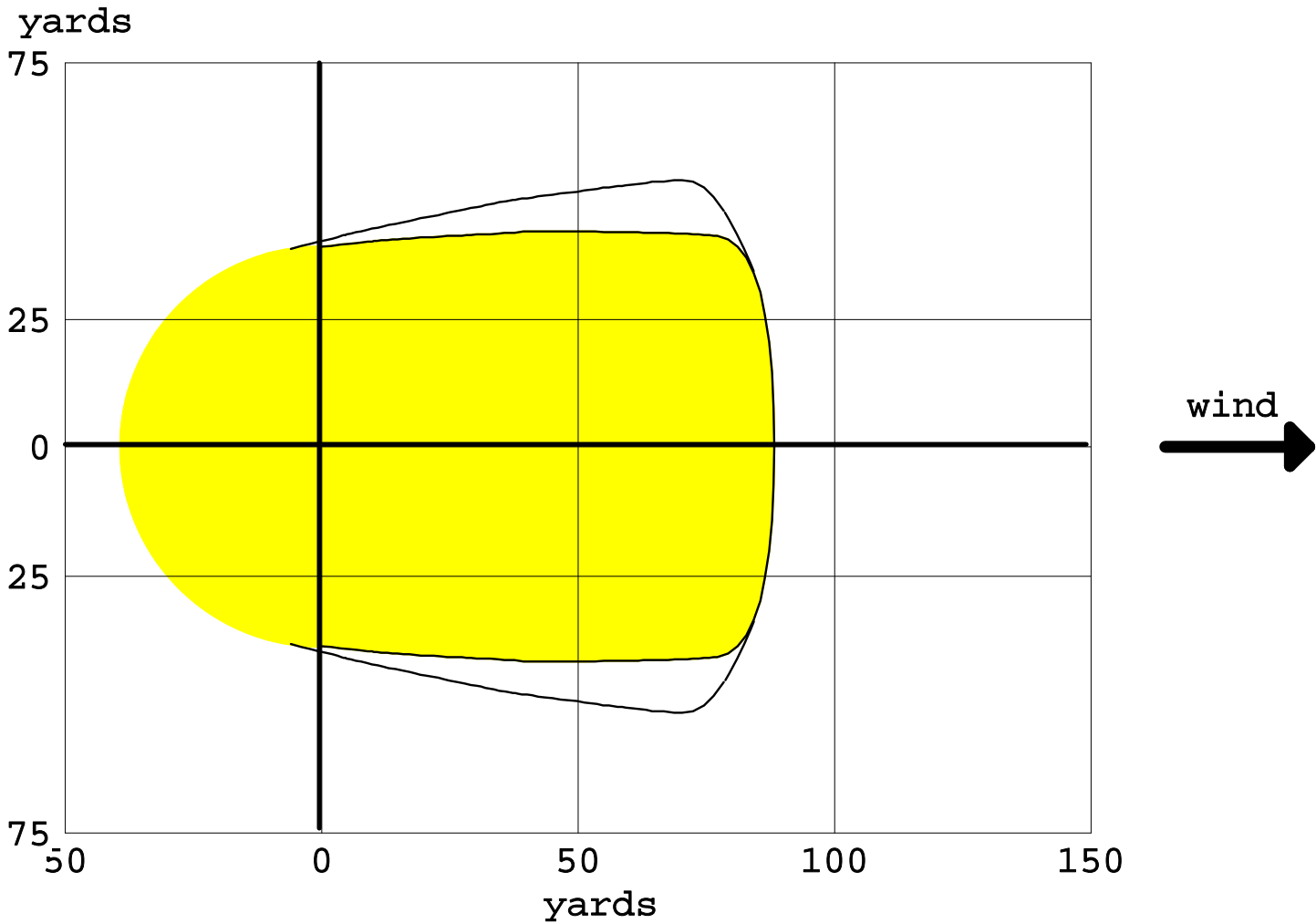
Flammable Threat Zone




Time: June 10, 2022 1309 hours EDT (using computer's clock)

Chemical Name: BENZENE
Carcinogenic risk - see CAMEO Chemicals

Wind: 12 miles/hour from SSE at 3 meters

THREAT ZONE:
Threat Modeled: Flammable Area of Vapor Cloud
Model Run: Gaussian
Red : 39 yards --- (7200 ppm = 60% LEL = Flame Pockets)
Note: Threat zone was not drawn because effects of near-field patchiness make dispersion predictions less reliable for short distances.
Yellow: 88 yards --- (1200 ppm = 10% LEL)



-  greater than 7200 ppm (60% LEL = Flame Pockets) (not drawn)
-  greater than 1200 ppm (10% LEL)
-  wind direction confidence lines

Thermal Radiation Threat Zone

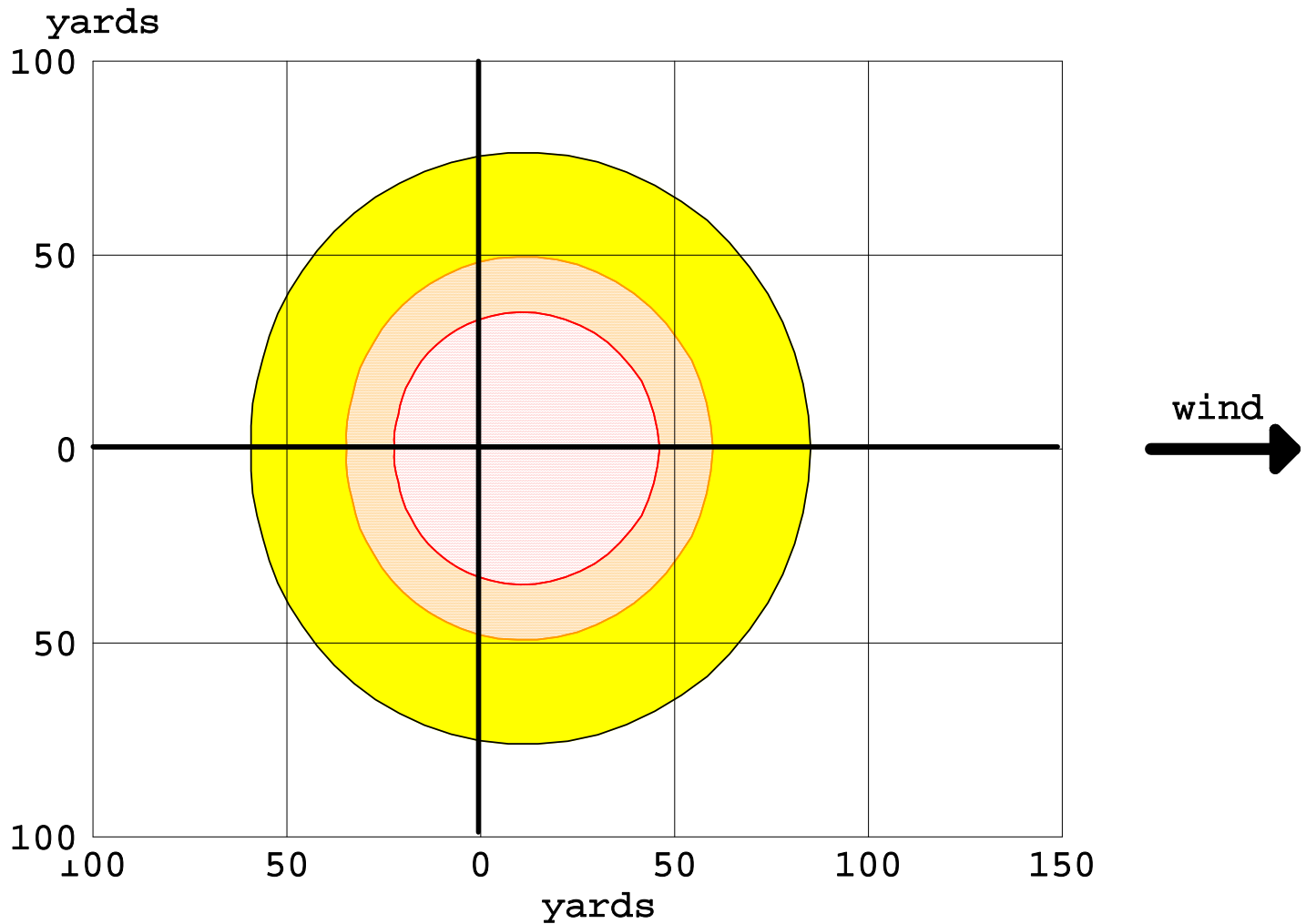
Time: June 10, 2022 1309 hours EDT (using computer's clock)




Chemical Name: BENZENE
Carcinogenic risk - see CAMEO Chemicals

Wind: 12 miles/hour from SSE at 3 meters

THREAT ZONE:

Threat Modeled: Thermal radiation from pool fire
Red : 46 yards --- (10.0 kW/(sq m) = potentially lethal within 60 sec)
Orange: 60 yards --- (5.0 kW/(sq m) = 2nd degree burns within 60 sec)
Yellow: 85 yards --- (2.0 kW/(sq m) = pain within 60 sec)



-  greater than 10.0 kW/(sq m) (potentially lethal within 60 sec)
-  greater than 5.0 kW/(sq m) (2nd degree burns within 60 sec)
-  greater than 2.0 kW/(sq m) (pain within 60 sec)



Toxic Threat Zone

ALOHA® 5.4.7

Time: June 10, 2022 1309 hours EDT (using computer's clock)

Chemical Name: BENZENE
Carcinogenic risk - see CAMEO Chemicals

Wind: 12 miles/hour from SSE at 3 meters

THREAT ZONE:

Model Run: Gaussian

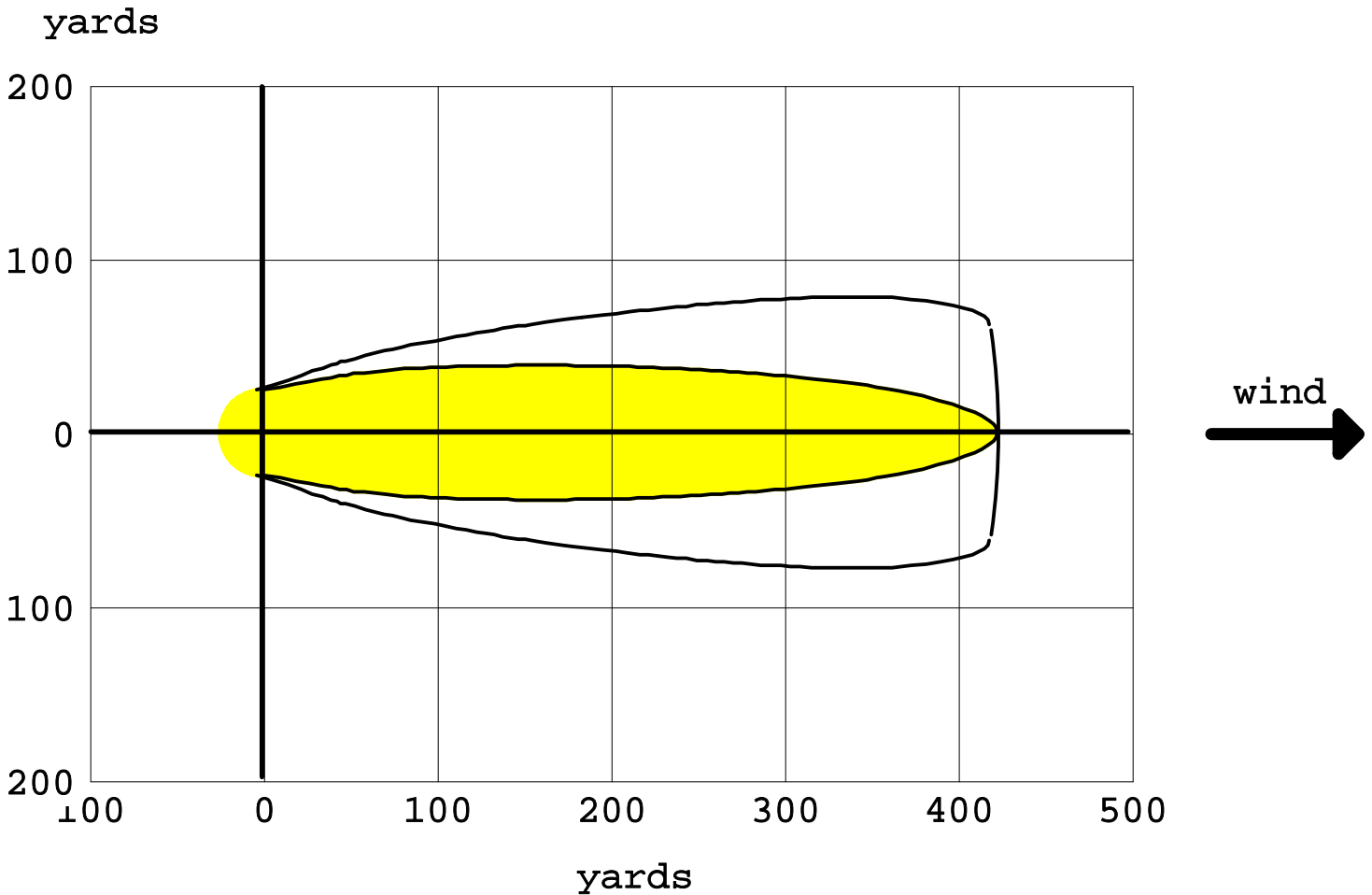
Red : 25 yards --- (4000 ppm = AEGL-3 [60 min])





Note: Threat zone was not drawn because effects of near-field patchiness make dispersion predictions less reliable for short distances.

Orange: 50 yards --- (800 ppm = AEGL-2 [60 min])

Note: Threat zone was not drawn because effects of near-field patchiness make dispersion predictions less reliable for short distances.

Yellow: 423 yards --- (52 ppm = AEGL-1 [60 min])



-  greater than 4000 ppm (AEGL-3 [60 min]) (not drawn)
-  greater than 800 ppm (AEGL-2 [60 min]) (not drawn)
-  greater than 52 ppm (AEGL-1 [60 min])
-  wind direction confidence lines

Source Strength (Evaporation Rate)

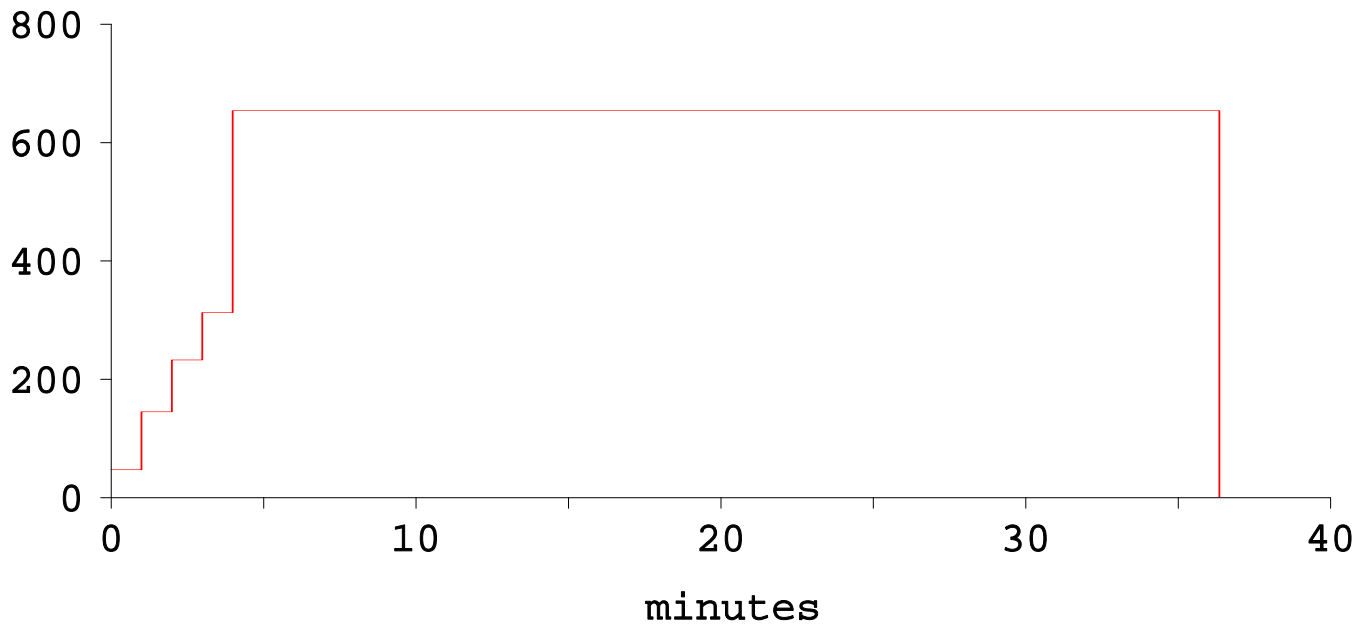
Time: June 10, 2022 1318 hours EDT (using computer's clock)

Chemical Name: BENZENE
Carcinogenic risk - see CAMEO Chemicals

SOURCE STRENGTH:

Leak from hole in horizontal cylindrical tank
Flammable chemical escaping from tank (not burning)
Tank Diameter: 8 feet Tank Length: 16.0 feet
Tank Volume: 6000 gallons
Tank contains liquid Internal Temperature: 80° F
Chemical Mass in Tank: 21.8 tons Tank is 100% full
Circular Opening Diameter: 0.5 feet
Opening is 4.00 feet from tank bottom
Ground Type: Default soil
Ground Temperature: equal to ambient
Max Puddle Diameter: Unknown
Release Duration: 36 minutes
Max Average Sustained Release Rate: 652 pounds/min
(averaged over a minute or more)
Total Amount Released: 21,800 pounds
Note: The chemical escaped as a liquid and formed an evaporating puddle.
The puddle spread to a diameter of 50 yards.

pounds/minute



Overpressure (Blast Force) Threat Zone

ALOHA® 5.4.7



Time: June 10, 2022 1318 hours EDT (using computer's clock)

Chemical Name: BENZENE

Carcinogenic risk - see CAMEO Chemicals

Wind: 12 miles/hour from WNW at 3 meters

THREAT ZONE:

Threat Modeled: Overpressure (blast force) from vapor cloud explosion

Type of Ignition: ignited by spark or flame

Level of Congestion: uncongested

Model Run: Gaussian

No explosion: no part of the cloud is above the LEL at any time

Flammable Threat Zone

Time: June 10, 2022 1318 hours EDT (using computer's clock)

Chemical Name: BENZENE
Carcinogenic risk - see CAMEO Chemicals

Wind: 12 miles/hour from WNW at 3 meters

THREAT ZONE:

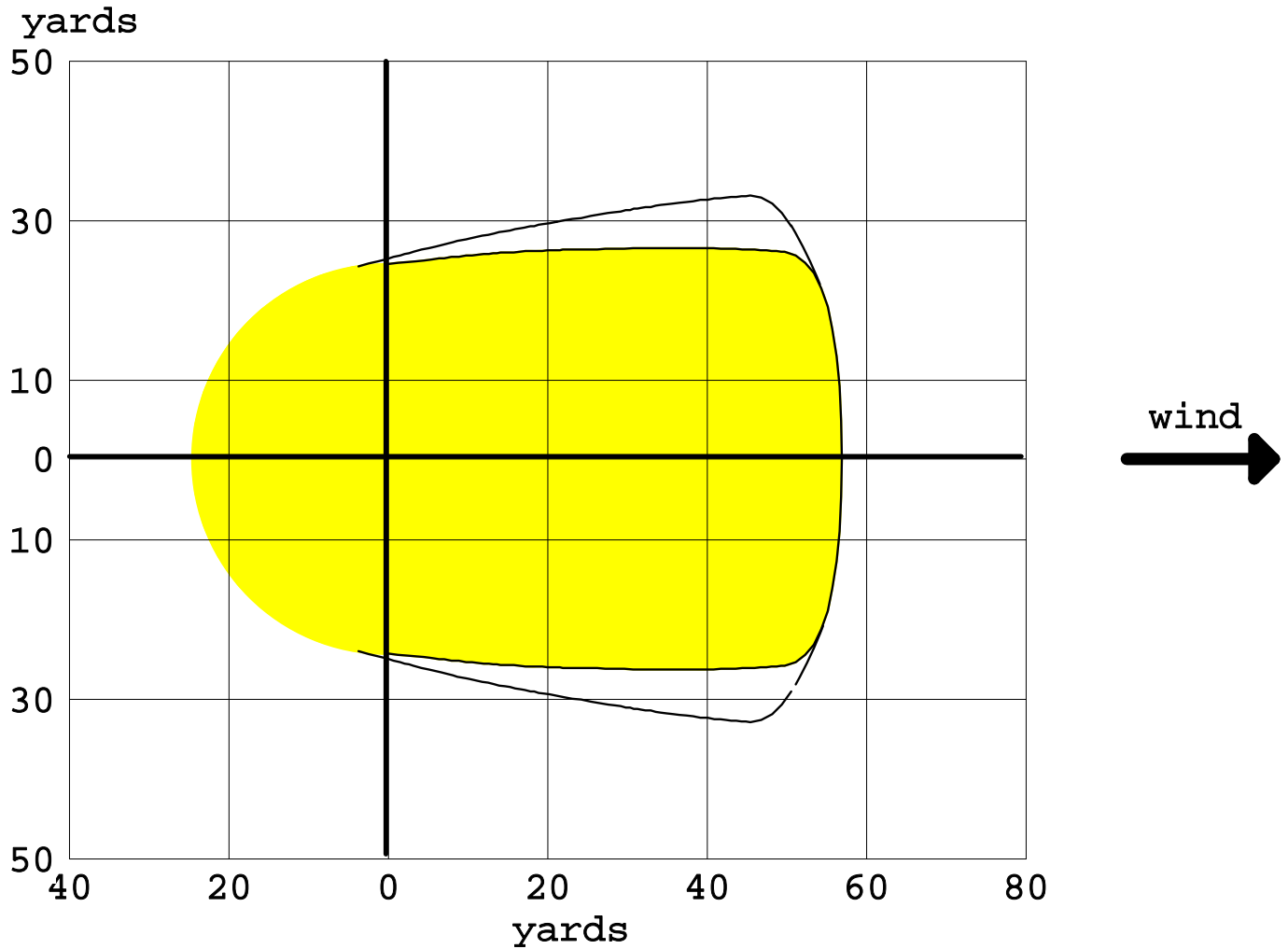
Threat Modeled: Flammable Area of Vapor Cloud




Model Run: Gaussian

Red : 25 yards --- (7200 ppm = 60% LEL = Flame Pockets)

Note: Threat zone was not drawn because effects of near-field patchiness make dispersion predictions less reliable for short distances.

Yellow: 57 yards --- (1200 ppm = 10% LEL)



-  greater than 7200 ppm (60% LEL = Flame Pockets) (not d
-  greater than 1200 ppm (10% LEL)
-  wind direction confidence lines

Thermal Radiation Threat Zone

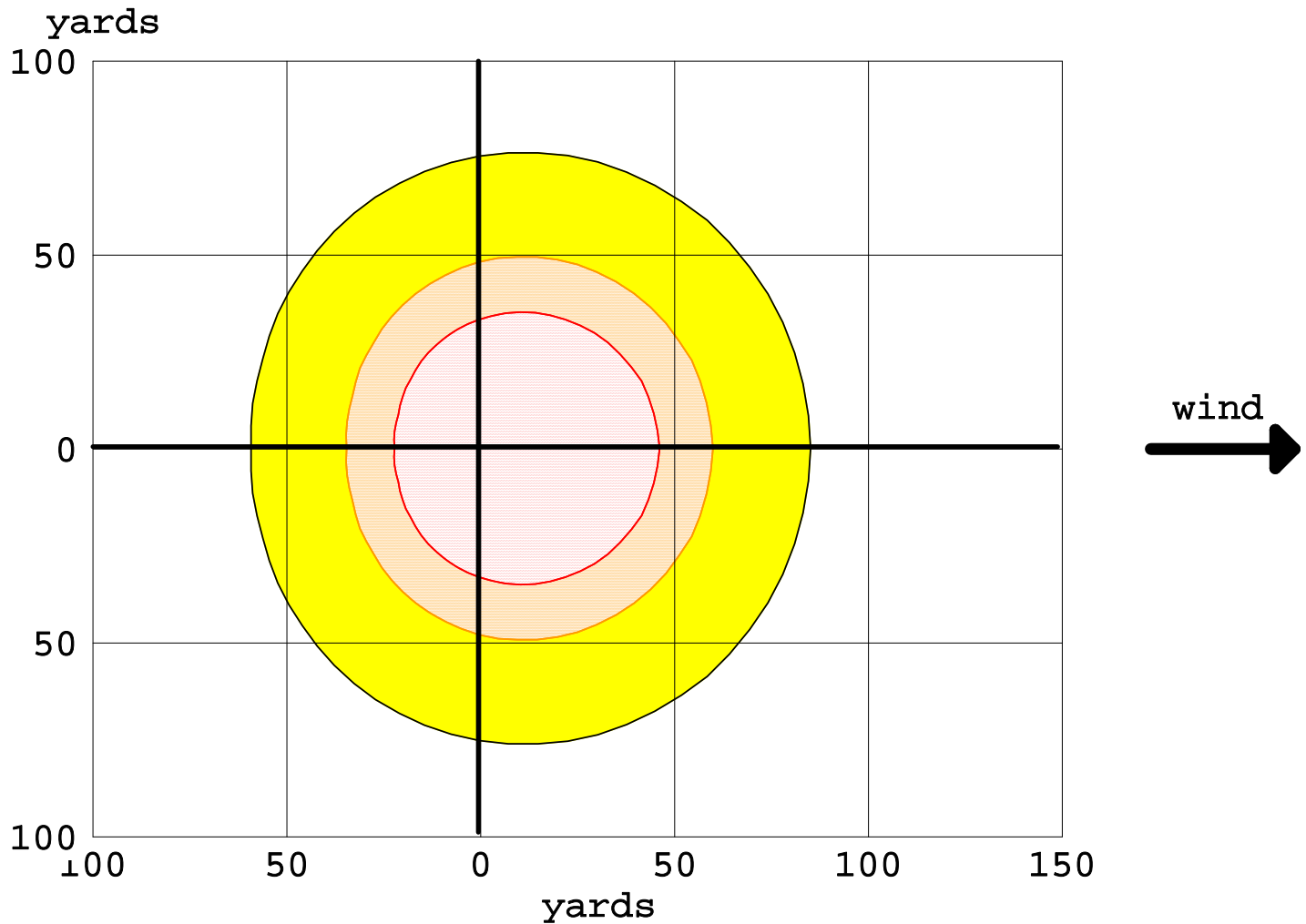
Time: June 10, 2022 1318 hours EDT (using computer's clock)




Chemical Name: BENZENE
Carcinogenic risk - see CAMEO Chemicals

Wind: 12 miles/hour from WNW at 3 meters

THREAT ZONE:

Threat Modeled: Thermal radiation from pool fire
Red : 46 yards --- (10.0 kW/(sq m) = potentially lethal within 60 sec)
Orange: 60 yards --- (5.0 kW/(sq m) = 2nd degree burns within 60 sec)
Yellow: 85 yards --- (2.0 kW/(sq m) = pain within 60 sec)



-  greater than 10.0 kW/(sq m) (potentially lethal within 60 sec)
-  greater than 5.0 kW/(sq m) (2nd degree burns within 60 sec)
-  greater than 2.0 kW/(sq m) (pain within 60 sec)

