

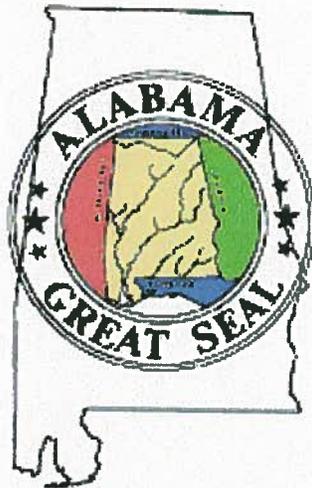
PRELIMINARY ASSESSMENT

ON

*COLISEUM BOULEVARD PLUME
MONTGOMERY COUNTY
MONTGOMERY, ALABAMA*

Prepared by:

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Site: Coliseum Boulevard Plume
Montgomery, Montgomery County, Alabama

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1. INTRODUCTION

Under authority of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA) and a cooperative agreement between the U.S. Environmental Protection Agency and the Alabama Department of Environmental Management (ADEM), a Preliminary Assessment (PA) was conducted at the Coliseum Boulevard Site on Coliseum Boulevard in Montgomery County, Montgomery, Alabama. The purpose of this investigation was to collect information concerning conditions at the site sufficient to assess the threat posed to human health and the environment and to determine the need for additional investigation under CERCLA/SARA or other action. The scope of the investigation included review of available file information, a site reconnaissance, and a comprehensive target survey.

2. SITE DESCRIPTION, OPERATIONAL HISTORY, AND WASTE CHARACTERISTICS

2.1. Location

The Coliseum Boulevard Plume site is located in northern Montgomery, Montgomery County, Alabama. The United States Geological Survey's (USGS) 7.5 Minute Quadrangle Map entitled Montgomery North, Alabama shows the location of the site to be in Sections 28, 29, 32 and 33 Township 17 North, Range 18 East. The latitude and longitude have been determined, by GPS, to be 32° 25' 01.27" North Latitude and 86° 16' 25.57" West Longitude. The site can be reached by traveling west on Interstate 85 into Montgomery, Alabama. In Montgomery take exit # 6 and go north on Alabama State Highway 152. Continue on Alabama State Highway 152 for approximately 6.7 miles and turn left (south) on to Coliseum Boulevard (Reference 1 & 2).

The climate of Montgomery County is considered to be nearly subtropical with an average annual temperature of 65.4°F. The average temperature during the summer is 80.6°F, and the average temperature during the winter is 50.1°F. The average annual

rainfall is 50 inches, and approximately 17.5 of the 50 inches of rain per year drains into the streams (Reference 2).

2.2. Site Description

The site consists of property with groundwater contamination with no clearly identifiable source, and covers an area of approximately 600 acres. The site is located in an area of mixed land use with the majority of the site, approximately 340 acres, consisting of residential neighborhoods. The State of Alabama Department of Transportation Materials and Tests Bureau offices, Materials and Tests Laboratory, and the State of Alabama Department of Finance Printing and Publication facility are located in the south central portion of the site. The City of Montgomery Zoo, Chisholm Community Center, and Chisholm Elementary School are located on the northwestern portion of the site. Vista Trace Apartments, Vista View Shopping Center, and an Amoco gas station are located in the north central portion of the site. Approximately 120 acres of the site are undeveloped (Reference 1).

The site is bordered to the west by residential and commercial property, to the north by residential and undeveloped property, to the east by commercial property, and to the south by residential, recreational, and commercial property. The majority of the site is open and accessible to the public, and the nearest residence is located on site. There is a minimal slope to the site and stormwater drainage is into drainage ditches and the City of Montgomery storm sewer system which drains into the drainage ditches (Reference 1).

2.3. Operational History and Waste Characteristics

This majority of the site is currently being used for residential, commercial, and recreational purposes. The western portion of the site is currently and has historically been occupied by residential houses in the Chisholm subdivision. The Chisholm community was developed in the 1940's and 1950's and has an estimated population of 2,112 residents. The Eastern Meadows subdivision is located in the central portion of the site and consists of 77 houses and 26 townhouses with an estimated population of 330 residents. The houses in the Eastern Meadows subdivision were built in the early 1980's and the townhouses were built in the early 1990's. The Vista View subdivision is located in the southeastern portion of the site and consists of approximately 173 houses and has an estimated population of 555 residents. The development of the Vista View subdivision began in the early 1980's and is still in progress. The Vista Terrace Apartments are located in the north central portion of the site and were built in the late 1990's. The apartments consist of 12 buildings with 4 units in each building and have an estimated resident population of 154. Prior to the development of the Eastern Meadows and Vista View subdivisions the property was undeveloped and owned by Alfa Mutual Fire Insurance Company (Alfa). Alfa purchased the property from the State of Alabama in 1972, and the property was used by Kilby Prison to grow agricultural crops from 1921 until approximately the mid 1960's (Reference 1, 3, & 9).

Chisholm Elementary School, the City of Montgomery Zoo, and the Chisholm Community Center are currently located the northwestern portion of the site. Chisholm Elementary School has been operating since approximately 1925, and has an enrollment of 830 and a staff of 75 (Reference 27). The City of Montgomery Zoo was opened in 1972 on 6 acres, and was expanded to 40 acres in 1991. The zoo currently has 80 employees and is visited by approximately 300,000 people per year (Reference 26). The Chisholm Community Center is used for recreational activities by adults and children, and has been operating since 1981. The Community Center has a staff of 5, and is visited by approximately 25 adults and 25 children per day. During the summer months the community center conducts full day programs for approximately 100 children (Reference 25). Prior to the development of the City of Montgomery Zoo and the Chisholm Community Center a racetrack was present on this portion of the site. The racetrack was present in aerial photographs from 1958 through 1964; however, no information on the use and dates of operation of the racetrack could be located (Reference 9).

The Vista View Shopping Center and an Amoco Service Station are currently located in the north central portion of the site. The Vista View Shopping Center consists of 13 commercial businesses with approximately 75 employees, and the Amoco has approximately 8 employees. Both the shopping center and the service station were built in the late 1990's, and prior to the development of the shopping center and the service station the property was undeveloped and owned by Alfa Mutual Fire Insurance Company (Alfa). Alfa purchased the property from the State of Alabama in 1972, and the property was used by Kilby Prison to grow agricultural crops from 1921 until approximately the mid 1960's (Reference 1, 3, & 9).

The State of Alabama Department of Transportation Sixth Division offices are located in the south central portion of the site, and employ 129 people. The Sixth Division offices located on the site consists of 3 office buildings, two trailers, a gas station, and a laboratory. The buildings are used for administrative offices, the gas station is used for refueling state vehicles, and the laboratory is used for geotechnical analysis. The office buildings, laboratory, and the gas station were constructed in 1972, and prior to the development of the Sixth Division offices the property was used for residential and agricultural purposes (Reference 1, 9, & 28).

The State of Alabama Department of Transportation Materials and Tests Bureau offices, and Materials and Tests Laboratory are located in the south central portion of the site. The office building was built in the early 1970's and is currently and historically used as administrative offices. The Materials and Tests Laboratory was built in 1961 with additions being built in 1975 and 1994. The laboratory is currently and has historically been used as a testing laboratory for construction materials, and is currently classified as a Conditionally Exempt Small Quantity Generator. Approximately 150 pounds of hazardous waste per month is produced from operations at the facility. Trichloroethylene is currently and has historically been used in the hot mix asphalt lab, paint lab, and the liquid asphalt lab. Approximately 5 gallons of trichloroethylene is used each month and waste trichloroethylene is collected and recycled by distillation at the site. Ninety-four

employees work in the offices and the laboratory, and prior to the development of the office buildings the property was used for residential and agricultural purposes (Reference 1, 9, 16, & 28).

The State of Alabama Department of Department of Finance Printing and Publication facility is located in the south central portion of the site. The facility was built in 1987 and currently and historically has been used as a printing facility with 59 employees. The facility is currently classified as a Conditionally Exempt Small Quantity Generator, and produces approximately 1 gallon of waste per week. The waste generated at the facility consists of a mixture of electrostatic fountain solution, blanket wash, and ink. Chlorinated solvents have been used at the facility, but only in small amounts. Historically the waste from the facility has been discharged to the sanitary sewer. Prior to construction of the facility the property was vacant and has historically been used for residential and agricultural purposes (Reference 1, 9, 15, & 24).

From November 16 to 18, 1999 groundwater samples were collected from fourteen monitoring wells located on the site. The groundwater samples were submitted to the ADEM Central Laboratory for Volatile Organic Compound (VOC) analysis. Trichloroethylene was detected in 9 of the 14 monitoring wells and the detected concentrations ranged from 3.94 ppb to 468.7 ppb. 1, 1-Dichloroethene was detected in 5 of the 14 monitoring wells and the detected concentrations ranged from 0.543 ppb to 11.0 ppb. Chloroform was detected in 7 of the 14 monitoring wells and the detected concentrations ranged from 0.530 ppb to 3.48 ppb. Cis-1, 2-Dichloroethene was detected in 1 of the 14 monitoring wells at a concentration of 14.2 ppb. 1, 2, 4-Trimethylbenzene was detected in 1 of the 14 monitoring wells at a concentration of 0.704 ppb. All other VOC constituents were below the method detection limits (Table # 1) (Reference 17).

From February 16, 2000 until March 1, 2000, TTL, Inc. personnel, contracted by the Alabama Department of Transportation, collected soil and groundwater samples from sixteen borings at the site. TTL, Inc. collected a total of 49 soil samples from 16 borings and submitted them to an onsite mobile lab for Volatile Organic Compound (VOC) analysis. 1,1-Dichloroethene was detected in one sample at a concentration of 5.9 ppm, and trichloroethylene was detected in one sample at a concentration of 5.2 ppm. The analytical results for all of the remaining samples were below detection limits. ADEM personnel split 4 soil samples with TTL, Inc. and submitted them to the ADEM Central Laboratory for VOC analysis. The analytical results for these samples were below detection limits. TTL, Inc. collected a total of 37 groundwater samples from 16 borings. Trichloroethylene was detected in 20 of the samples at concentrations that ranged from 0.1 ppb to 11,000 ppb. ADEM personnel split 7 groundwater samples with TTL, Inc. and submitted them to the ADEM Central Laboratory for VOC analysis. Trichloroethylene was detected in 3 of the samples at concentrations of 977.5 ppb, 5,552.5 ppb, and 6,880 ppb (Table # 2) (Reference 18).

On March 2, 2000 ADEM personnel collected four surface water samples from two ditches at the Coliseum Boulevard Plume Site. Two samples were collected from the

ditch located east of Coliseum Boulevard and west of the Vista View Subdivision, and two samples were collected from the ditch located to the east of the City of Montgomery Zoo. The samples were submitted to the ADEM Central Laboratory for Volatile Organic Compound (VOC) analysis. Trichloroethylene was detected in two of the samples from the ditch located east of Coliseum Boulevard at concentrations of 43.1 ppb and 168.2 ppb. The analytical results for the samples collected from the ditch located to the east of the City of Montgomery Zoo were below detection limits (Table # 3) (Reference 20).

On March 21, 2000 ADEM personnel collected six surface water samples from two ditches at the Coliseum Boulevard Plume Site. Four samples were collected from the ditch located east of Coliseum Boulevard and west of the Vista View Subdivision, and two samples were collected from the ditch located to the east of the City of Montgomery Zoo. The samples were submitted to the ADEM Central Laboratory for VOC analysis. Trichloroethylene was detected in four of the samples from the ditch located east of Coliseum Boulevard at concentrations of 17.3 ppb, 32.3 ppb, 36.1 ppb, and 147.5 ppb. The analytical results for the samples collected from the ditch located to the east of the City of Montgomery Zoo were below detection limits (Table # 3) (Reference 20 & 21).

From May 9, 2000 until May 25, 2000, TTL, Inc. personnel, contracted by the Alabama Department of Transportation, collected soil and groundwater samples from 13 borings at the Coliseum Boulevard Plume Site. TTL, Inc. collected a total of 43 soil samples from the 13 borings and submitted them to an onsite mobile lab for Volatile Organic Compound (VOC) analysis. 1,1-Dichloroethene was detected in 2 sample at concentrations of 0.003 and 0.006 ppm. Cis-1,2-Dichloroethene was detected in 3 samples at concentrations of 0.003, 0.003, and 0.005 ppm. The analytical results for all of the remaining samples were below detection limits. ADEM personnel split 1 soil sample (PH27/1.5-2) with TTL, Inc. and submitted it to the ADEM Central Laboratory for VOC analysis. The analytical results for this sample was below detection limits. TTL, Inc. collected a total of 28 groundwater samples from the 13 borings. Trichloroethylene was detected in 18 of the samples at concentrations that ranged from 2.38 ppb to 305 ppb. ADEM personnel split 1 groundwater sample (PH27/27-29) with TTL, Inc. and submitted it to the ADEM Central Laboratory for VOC analysis. Trichloroethylene was detected in the sample at a concentration of 2,498.0 ppb (Table # 4) (Reference 19).

On May 24, 2000, ADEM personnel collected four surface water samples from the surface water drainage pathway from the Coliseum Boulevard Plume Site. Two samples were collected from an unnamed tributary to Three-Mile Branch located south of the railroad tracks and north of the Northern Boulevard. Two samples were collected from Three-Mile Branch with one sample collected north (downgradient) of the confluence of the unnamed tributary and one sample collected south (upgradient) of the confluence of the unnamed tributary. The samples were submitted to an onsite mobile lab for Volatile Organic Compound (VOC) analysis. The analytical results for the samples were below detection limits. One split sample was collected and submitted to the ADEM Central

Laboratory for VOC analysis. The analytical results for this sample was below detection limits (Reference 22).

On July 18, 2000, TTL, Inc. personnel, contracted by the Alabama Department of Transportation, collected 2 ambient air samples at the site. The samples were collected on Broadway Street in the Chisholm neighborhood, and analyzed for Volatile Organic Compounds (VOCs). The analytical results for both samples were below detection limits (Reference 29).

The chemical of concern for the site is trichloroethylene and associated breakdown products. Trichloroethylene is currently and has been historically used at the Alabama Department of Transportation Materials Test Laboratory for asphalt testing. Approximately 5 gallons of trichloroethylene is used each month and waste trichloroethylene is collected and recycled by distillation at the site. Small quantities of chlorinated solvents have also been used at the State of Alabama Department of Department of Finance Printing and Publication facility. Analytical results from samples collected from the site have revealed elevated concentrations of trichloroethylene and associated breakdown products in the groundwater and surface water. Results of ambient air sampling conducted at the site have not detected volatile organic compounds above method detection limits, and soil analytical results collected to date have not shown a clearly defined source area.

3. GROUNDWATER PATHWAY

3.1. Hydrogeologic Setting

The site is situated in northern Montgomery County in what is considered to be the Alluvial Plain District of the East Gulf Coastal Plain physiographic section. The Alluvial Plain District consists of broad flat flood plains and terraces. The surface elevations for the Alluvial Plain District typically range from 130 to 200 feet above mean sea level (MSL). The surface elevation at the site is approximately 200 feet MSL (Reference 2).

Geologic units exposed in Montgomery County are of Cretaceous and Quaternary age and consist chiefly of sand, chalk, gravel, and clay. The units, from youngest to oldest, are: Quaternary alluvial deposits; the Selma Group; the Eutaw Formation; and the Tuscaloosa Formation (Reference 2).

The geologic unit that outcrops in the vicinity of the site is a Quaternary alluvial deposit. This unit consists of gravel, sand, silt, and clay that underlie flood plains of present and ancestral large streams. Alluvial deposits range in thickness from 30 to 80 feet thick. The Selma Group is not present in the subsurface at the site. (Reference 2).

The Eutaw Formation underlies the Quaternary alluvial deposit in the vicinity of Montgomery and consists of upper and lower zones of marine sands. The upper zone consists of up to 150 feet of massive glauconitic sand interbedded with calcareous

sandstone and sandy limestone. The lower zone consists of approximately 30 to 50 feet of glauconitic sand interbedded with sandy clay. Approximately 50 to 150 feet of calcareous clay and sandy clay separate the two zones (Reference 2).

The Tuscaloosa Group underlies the Eutaw Formation, and is composed of the Gordo and the Coker Formations west of the Tallapoosa River. East of the Tallapoosa River the Gordo and Coker Formations are grouped together as the Tuscaloosa Group undifferentiated. The Gordo Formation consists of a basal zone of gravelly sand that is overlain by alternating lenticular beds of sand and mottled clay. The Gordo Formation is approximately 100 to 300 feet thick and is underlain by the Coker Formation. The Coker Formation ranges in thickness from less than 100 feet to 1000 feet and is divided into a basal zone and an upper zone. The basal zone consists of nonmarine gravel, sand, and clays. The upper zone consists of marine sand and clay beds. Approximately 50 feet of clay separate the two zones. Igneous and metamorphic crystalline rocks underlie the Coker Formation. The site is not located in an area that is susceptible to karst development (Reference 2).

The majority of soils mapped at the site are classified by the Soil Conservation Service as Amite fine sandy loam. Soils in this classification are deep, well drained, level to strongly sloping soils that developed from old alluvium that washed from soils of the Coastal Plain. Generally the surface layer consists of a dusky-red or dark-brown to grayish-brown fine sandy loam, and the subsoil consists of a red to dark-red sandy clay loam to sandy clay. Amite soils are underlain by sand and gravel at depths that range from 3 to 10 feet. The permeability of these soils is moderate to moderately rapid, and the soils have a slope of 0 to 5 percent (Reference 2).

The groundwater aquifers that have recharge areas in the vicinity of the city of Montgomery include the Watercourse aquifer, the Eutaw aquifer, the Gordo aquifer, and the Coker aquifer. The site is located in the recharge area of the Watercourse aquifer. The Watercourse aquifer is composed of alluvial deposits and is hydraulically interconnected with the Eutaw aquifer. The Eutaw aquifer, the Gordo aquifer, and the Coker aquifer are separated by confining layers of clay and are not interconnected. The source of recharge for these aquifers is rainfall. Of the 50 inches of annual rainfall, approximately 4 to 5 inches infiltrates to serve as aquifer recharge (Reference 2).

Groundwater flow in the vicinity of the site has been documented to flow from the central portion of the site to the northeast, north, northwest, west and southwest. The depth to the water table at the site ranges from 11.78 feet to 23.19 feet below land surface, and the permeability of the unsaturated zone is 4.2×10^{-3} to 4.2×10^{-4} cm/sec for the soil units mapped at the site (Reference 2, 3, & 4).

3.2. Groundwater Targets

There are two drinking water systems with public water supply wells within the radius of review: Montgomery Water Works and Tri-Communities Water System.

The Montgomery Water Works is a blended system that uses 34 percent groundwater and 66 percent surface water, and serves a population of 216,000. Seven water systems in the Montgomery area purchase water from the Montgomery Water Works (Table # 5). Wetumpka Water Works and Sewer Board purchases 27 percent of their water from the Montgomery Water Works and serves a population of 7,353. Central Elmore Water Authority purchases 18 percent of their water from the Montgomery Water Works and serves a population of 23,793. Elmore Water Authority purchases 39 percent of their water from the Montgomery Water Works and serves a population of 8,940. East Montgomery Water and Fire Authority purchases 0.3 percent of their water from the Montgomery Water Works and serves a population of 6,999. Montgomery North Water and Fire Authority purchases 100 percent of their water from the Montgomery Water Works and serves a population of 1,845. Pintlala Water and Fire Protection Authority purchases 41 percent of their water from the Montgomery Water Works and serves a population of 1,800. Hunter's Walk Manufactured Home Community purchases 100 percent of their water from the Montgomery Water Works and serves a population of 663 (Reference 12 & 13). The total apportioned population served by groundwater for the Montgomery Water Works and Sewer Board (including the systems that purchase water) is 78,668. Montgomery Water Works currently pumps groundwater from 42 wells that provide 34 percent of the water used by the system, and no single well supplies more than 40 percent of the water for the system. The apportioned population for each well in the system is 1,873 (Reference 12 & 23).

Tri-Community Water System is a blended system that uses 80 percent groundwater and purchases 20 percent of its supply from Millbrook Utilities. Groundwater is pumped from 4 wells, and the system serves a population of 8,640. One public water supply well for this system is located within the four-mile radius of the site, and serves an apportioned population of 1,728. A wellhead protection area has not been delineated for any of the system's wells (Reference 12).

There are 10 active public water supply wells, 4 stand-by public water supply wells, and 2 public water wells that are currently out of service located within 4 miles of the site (Table # 6). The closest public water supply wells to the site are operated by the Montgomery Water Works and Sanitary Board. The closest active public water supply well (# 14) is located approximately 0.95 miles to the southwest of the site. Tetrachloroethylene has been detected above maximum contaminant levels in two wells (# 9E & 9W) during past sampling events, and both of these wells have been taken out of service. Since the main contaminant in groundwater at the site is trichloroethylene the contamination in these wells is not believed to be attributed to the site. Domestic wells are not expected within the immediate vicinity of the site due to the urban nature of the site; however, domestic wells may be located in the more rural areas of the 4-mile radius

of review for the site. The 10 active public water supply wells and 4 stand-by public water supply wells are considered secondary targets in this study (Reference 2 & 12).

3.3. Groundwater Conclusions

A release of CERCLA hazardous substances to groundwater is documented at the site. Trichloroethylene has been detected at concentrations exceeding MCL's in groundwater samples collected at the site, and the area of groundwater contamination covers an area of approximately 600 acres. Trichloroethylene has historically been used at the Alabama Department of Transportation's Materials and Test Laboratory from 1961 until the present. Small quantities of chlorinated solvents have also been used at the Alabama Department of Department of Finance Printing and Publication facility. There are 10 active public water supply wells, and 4 stand-by public water supply wells located within 4 miles of the site. The closest public water supply well to the site is located approximately 0.95 miles to the southwest of the site. These wells have been identified as secondary targets in this study.

4. SURFACE WATER PATHWAY

4.1. Hydrologic Setting

The site is situated in northern Montgomery County in what is considered to be the Alluvial Plain District of the East Gulf Coastal Plain physiographic section. The Alluvial Plain District consists of broad flat flood plains and terraces. The surface elevations for the Alluvial Plain District typically range from 130 to 200 feet above mean sea level (MSL). The surface elevation at the site is approximately 200 feet MSL (Reference 2). The site does not lie within the 500-year flood interval (Reference 6).

Surface water drainage from the site is into drainage ditches located throughout the site. These drainage ditches flow into two main ditches that comprise two separate surface water drainage pathways (Eastern and Western) from the site (Reference 2).

The eastern drainage pathway consists of a ditch that flows to the northeast from the Alabama Department of Transportation property through the Eastern Meadows Subdivision, and a ditch that flows to the north from the Alabama Department of Environmental Management property through the Vista View Subdivision. The two ditches converge in the northeastern portion of the Vista View Subdivision and flow into an unnamed tributary of Three-Mile Branch. The unnamed tributary of Three-Mile Branch flows approximately 1.07 miles to the northeast and flows into Three-Mile Branch. Three-Mile Branch flows approximately 2.45 miles to the north and flows into Galbraith Mill Creek. Galbraith Mill Creek flows approximately 2.82 miles to the northwest and flows into the Alabama River. The Alabama River makes-up the remainder of the 15-mile surface water pathway from the site (Reference 2).

The western drainage pathway consists of a ditch that flows east through the Chisholm subdivision and north along the eastern perimeter of the City of Montgomery Zoo. This ditch flows north from the zoo and flows into an unnamed creek. The unnamed creek flows approximately 4.9 miles to the north and flows into the Alabama River. The Alabama River makes-up the remainder of the 15-mile surface water pathway from the site (Reference 2).

The unnamed creek, the unnamed tributary of Three-Mile Branch, Three-Mile Branch, and Galbraith Mill Creek are not listed in the ADEM Admin. Code R. 335-6-11-.02 with a use classification; however, it is noted in the regulations that segments not listed should be designated as fish and wildlife. Low flow data was not available for the unnamed creek, the unnamed tributary of Three-Mile Branch, Three-Mile Branch, and Galbraith Mill Creek. The unnamed creek, the unnamed tributary of Three-Mile Branch, Three-Mile Branch, and Galbraith Mill Creek are minimal streams and the low flow rates for these streams are estimated to be less than 10 cfs (Reference 2).

The Alabama River and is listed in the ADEM Admin. Code R. 335-6-11-.02 with a use classification of fish and wildlife for the section along the 15-mile surface water pathway from the site, and has a seven day ten year low flow rate of 5,120 cfs and a seven day two year low flow rate of 6,980 cfs (Reference 2).

Surface water samples collected from the drainage pathway east of Coliseum Boulevard detected trichloroethylene at concentrations that ranged from 17.3 ppb to 168.2 ppb, and samples collected from this drainage pathway north of the Northern Boulevard near the railroad tracks were below detection limits. Samples collected from the surface water pathway located to the east of the City of Montgomery Zoo were below detection limits (Table # 3) (Reference 20, 21, & 22).

4.2. Surface Water Targets

The Probable Point of Entry (PPE) for both of the surface water drainage pathways are located on the site, and there are no known drinking water intakes located within fifteen miles downstream of the site. Most residences obtain their water from municipal water systems, which obtains their water from groundwater and a surface water intake located up-gradient from the site (Reference 1 & 2).

The Alabama River is used for recreational fishing, and Three-Mile Branch and Galbraith Mill Creek could potentially be used for recreational fishing (Reference 1). Wetlands are present along both of the surface water drainage pathways from the site. Approximately 0.76 miles of frontage of wetlands are present along the eastern surface water pathway, and approximately 3.4 miles of frontage of wetlands are present along the western surface water pathway. A total of 4.2 miles of wetland frontage are present along the surface water pathways from the site, and the nearest wetlands are located approximately 0.9 miles downstream of the PPE along the western surface water pathway (Reference 2). The surface water pathway and the land along its banks could be habitat for federally

listed threatened or endangered species, and there are 10 endangered or threatened species listed for this area (Table # 7) (Reference 7 and 8).

4.3. Surface Water Conclusions

Surface water samples collected at the site indicated that the surface water pathway has been affected by contamination from the site; however, due to the limited extent of surface water contamination no primary surface water targets have been identified in this study. The fishery, wetlands, and endangered species habitat identified along the surface water pathway are considered secondary targets in this study.

5. SOIL EXPOSURE AND AIR PATHWAYS

5.1. Physical Conditions

This site is currently being actively used for residential, commercial, and recreational purposes with the majority of the site, approximately 340 acres, consisting of residential neighborhoods. The majority of the site is open and accessible to the public with some commercial and residential areas fenced to limit access (Reference 1). Two ambient air samples have been collected at the site. The samples were collected on Broadway Street in the Chisholm neighborhood, and analyzed for Volatile Organic Compounds. The analytical results for both samples were below detection limits (Reference 29).

5.2. Soil and Air Targets

The site consists of areas of residential, commercial, and recreational property, and is bordered by areas of mixed land use. There are currently approximately 525 workers and 3,151 residents located on the site (Reference 1, 24, 25, 26, 27, 28, & 30). One school and no day care facilities are located onsite. The school located onsite is Chisholm Elementary School, which is located on the northwest portion of the site, and has an enrollment of 830 and a staff of 75 (Reference 27). The total population within a four mile radius of the site is 114,503 people (Table # 8) (Reference 11).

There are 10 federally listed endangered or threatened species listed for this area (Table # 7) (Reference 8 and 9). Some areas of the site are undeveloped and may be suitable habitats for federally designated endangered or threatened species; however, due to its urban nature the majority of the site is not expected to be critical habitat for federally designated endangered or threatened species.

5.3. Soil Exposure and Air Pathways Conclusions

Since the majority of the contamination at the site is in the groundwater and surface water, and only low concentrations of chlorinated solvents have been observed in the soils the soil and air exposure pathways appear to pose a minimal threat at the site. The depth to groundwater at the site ranges from 11.78 to 23.19 below ground surface

(Reference 3 & 17). The depth to groundwater should limit the exposure to workers and residents at the site. Ambient air samples collected at the site have not detected chlorinated solvent vapors in the air on the site.

6. SUMMARY AND CONCLUSIONS

The Coliseum Boulevard site is approximately 600 acres and consists of areas of residential, commercial, and recreational property. The current site boundaries are defined by the estimated limits of chlorinated solvent groundwater contamination. A release of CERCLA hazardous substances to groundwater and the surface water has been documented at the site. Trichloroethylene concentration in groundwater samples collect from the site have ranged from below detection limits to 11,000 ppb. Contaminated groundwater is also believed to be discharging into surface water at the site. Surface water samples collected from the eastern drainage pathway have concentrations of trichloroethylene that range from below detection limits to 168.2 ppb. Since the majority of the contamination at the site is in the groundwater and surface water, and only low concentrations of chlorinated solvents have been observed in the soils the soil and air exposure pathways appear to pose a minimal threat at the site. Trichloroethylene has historically been used at the Alabama Department of Transportation's Materials and Test Laboratory from 1961 until the present. Small quantities of chlorinated solvents have also been used at the Alabama Department of Department of Finance Printing and Publication facility. There are 10 active public water supply wells, and 4 stand-by public water supply wells located within 4 miles of the site. The closest public water supply well to the site is located approximately 0.95 miles to the southwest of the site. A fishery, wetlands, and potential endangered species habitat have been identified along the 15-mile surface water pathway. There is 1 school and no day care facilities located onsite, and the estimated onsite resident population is 3,151. Since groundwater and surface water contamination has been documented at the site ADEM recommends that the site be further evaluated under the authority of CERCLA and SARA.

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REFERENCES

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18. Gibson, Joseph L., Alabama Department of Environmental Management, Water Division - Groundwater Branch, Groundwater Sampling 2/16/00 – 3/1/00, Coliseum Boulevard Plume Site: 7/5/00.
19. Gibson, Joseph L., Alabama Department of Environmental Management, Water Division - Groundwater Branch, Groundwater Investigation 5/9/00 – 5/25/00, Coliseum Boulevard Plume Site: 7/7/00.
20. Gibson, Joseph L., Alabama Department of Environmental Management, Water Division - Groundwater Branch, Surface Water Sampling 3/2/00 & 3/21/00, Coliseum Boulevard Plume Site: 7/5/00.
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 24. Gibson, Joseph L., Alabama Department of Environmental Management, Water Division - Groundwater Branch, Phone Conversation with Gerald Wilson of the Alabama Department of Finance Printing and Publication Division: 9/11/00.
 25. Gibson, Joseph L., Alabama Department of Environmental Management, Water Division - Groundwater Branch, Phone Conversation with Paula Boychuck of the Chisholm Community Center: 9/11/00.
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-

REFERENCE 1



ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

POST OFFICE BOX 301483 • 1400 COLISEUM BLVD 36110-2059
MONTGOMERY, ALABAMA 36130-1463
WWW.ADEM.STATE.AL.US
(334) 271-7700

JAMES W. WARR
DIRECTOR

DON SIEGELM
GOVERN

September 12, 2000

MEMORANDUM

TO: Stephen A. Cobb, Chief
Hazardous Waste Branch
Land Division

FROM: Joseph Gibson, Hydrogeologist *J. S. G.*
Groundwater Branch
Water Division

RE: Site Reconnaissance
Coliseum Boulevard Plume Site
Montgomery, Montgomery County, Alabama

Facsimiles (33)
Administration: 271-79
General Counsel: 394-43
Air: 279-30
Land: 279-30
Water: 279-30
Groundwater: 270-56
Field Operations: 272-81
Laboratory: 277-67
Mining: 394-43
Education/Outreach: 394-43

On September 11, 2000 a site reconnaissance was conducted on the Coliseum Boulevard Plume Site to collect information for a Preliminary Assessment conducted under CERCLA. The Coliseum Boulevard Plume site is located in northern Montgomery, Montgomery County, Alabama. The United States Geological Survey's (USGS) 7.5 Minute Quadrangle Map entitled Montgomery North, Alabama shows the location of the site to be in Sections 28, 29, 32 and 33 Township 17 North, Range 18 East. The latitude and longitude have been determined, by GPS, to be 32° 25' 01.27" North Latitude and 86° 16' 25.57" West Longitude. The site can be reached by traveling west on Interstate 85 into Montgomery, Alabama. In Montgomery take exit # 6 and go north on Alabama State Highway 152. Continue on Alabama State Highway 152 for approximately 6.7 miles and turn left (south) on to Coliseum Boulevard.

The site consists of property with groundwater contamination with no clearly identifiable source, and covers an area of approximately 600 acres. The site is located in an area of mixed land use with the majority of the site, approximately 340 acres, consisting of residential neighborhoods. The State of Alabama Department of Transportation Materials and Tests Bureau offices, Materials and Tests Laboratory, and the State of Alabama Department of Finance Printing and Publication facility are located in the south central portion of the site. The City of Montgomery Zoo, Chisholm Community Center, and Chisholm Elementary School are located on the northwestern portion of the site. Vista Trace Apartments, Vista View Shopping Center, and an Amoco gas station are located in the north central portion of the site. Approximately 120 acres of the site are undeveloped.



The site is bordered to the west by residential and commercial property, to the north by residential and undeveloped property, to the east by commercial property, and to the south by residential, recreational, and commercial property. The majority of the site is open and accessible to the public with some commercial and residential areas fenced to limit access. There is a minimal slope to the site and stormwater drainage is into drainage ditches and the City of Montgomery storm sewer system which drains into the drainage ditches.

Surface water drainage from the site is into drainage ditches located throughout the site. These drainage ditches flow into two main ditches that comprise two separate surface water drainage pathways (Eastern and Western) from the site. The PPE for both surface water pathways are located onsite, and wetlands were observed along both surface water pathways.

The eastern drainage pathway consists of a ditch that flows to the northeast from the Alabama Department of Transportation property through the Eastern Meadows Subdivision, and a ditch that flows to the north from the Alabama Department of Environmental Management property through the Vista View Subdivision. The two ditches converge in the northeastern portion of the Vista View Subdivision and flow into an unnamed tributary of Three-Mile Branch. The unnamed tributary of Three-Mile Branch flows into Three-Mile Branch. Three-Mile Branch flows to the north and flows into Galbraith Mill Creek. Galbraith Mill Creek flows to the northwest and flows into the Alabama River. The Alabama River makes up the remainder of the 15-mile surface water pathway from the site.

The western drainage pathway consists of a ditch that flows east through the Chisholm subdivision and north along the eastern perimeter of the City of Montgomery Zoo. This ditch flows north from the zoo and flows into an unnamed creek. The unnamed creek flows approximately 4.9 miles to the north and flows into the Alabama River. The Alabama River makes up the remainder of the 15-mile surface water pathway from the site.

On September 11, 2000 site research was conducted at the Montgomery County Courthouse Annex, and following information was obtained from the Montgomery County Tax Assessor's office in Montgomery, Alabama. The Chisholm community was developed in the 1940's and 1950's, and records of previous use of the area were not available. The houses in the Eastern Meadows subdivision were built in the early 1980's and the townhouses were built in the early 1990's. The development of the Vista View subdivision began in the early 1980's, and prior to development of these subdivisions the property was owned by the State of Alabama.

cc: Jymalyn Redmond, Chief, Site Assessment Unit

REFERENCE 2



ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

POST OFFICE BOX 301483 • 1400 COLISEUM BLVD 38110-2050

MONTGOMERY, ALABAMA 36130-1483

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(334) 271-7700

JAMES W. WARR
DIRECTOR

DON SIEGEL
GOVERNOR

August 14, 2000

MEMORANDUM

TO: Stephen A. Cobb, Chief
Hazardous Waste Branch
Land Division

FROM: Joseph L. Gibson, Hydrogeologist *J. L. G.*
Groundwater Branch
Water Division

RE: Preliminary Assessment - Groundwater
Coliseum Boulevard Plume
Montgomery, Montgomery County, Alabama

Facsimiles ()
Administration: 271-
General Counsel: 384-
Air: 279-
Land: 279-
Water: 279-
Groundwater: 272-
Field Operations: 277-
Laboratory: 384-
Mining: 384-
Education/Outreach: 384-

The following groundwater report was prepared through a search of literature and information available to the Groundwater Branch, and the author has conducted a site reconnaissance.

LOCATION

The Coliseum Boulevard Plume site is located in northern Montgomery, Montgomery County, Alabama (Figure 1). The United States Geological Survey's (USGS) 7.5 Minute Quadrangle Map entitled Montgomery North, Alabama shows the location of the site to be in Sections 28, 29, 32 and 33 Township 17 North, Range 18 East (Figure 2). The latitude and longitude have been determined, by GPS, to be 32° 25' 01.27" North Latitude and 86° 16' 25.57" West Longitude.

TOPOGRAPHY AND SURFACE WATER

The site is situated in northern Montgomery County in what is considered to be the Alluvial Plain District of the East Gulf Coastal Plain physiographic section. The Alluvial Plain District consists of broad flat flood plains and terraces. The surface elevations for the Alluvial Plain District typically range from 130 to 200 feet above mean sea level (MSL) (Scott, et al., 1987). The surface elevation at the site is approximately 200 feet MSL.



Surface water drainage from the site (Figure 3) is into drainage ditches located throughout the site. These drainage ditches flow into two main ditches that comprise two separate surface water drainage pathways (Eastern and Western) from the site.

The eastern drainage pathway consists of a ditch that flows to the northeast from the Alabama Department of Transportation property through the Eastern Meadows Subdivision, and a ditch that flows to the north from the Alabama Department of Environmental Management property through the Vista View Subdivision. The two ditches converge in the northeastern portion of the Vista View Subdivision and flow into an unnamed tributary of Three-Mile Branch. The unnamed tributary of Three-Mile Branch flows approximately 1.07 miles to the northeast and flows into Three-Mile Branch. Three-Mile Branch flows approximately 2.45 miles to the north and flows into Galbraith Mill Creek. Galbraith Mill Creek flows approximately 2.82 miles to the northwest and flows into the Alabama River. The Alabama River makes-up the remainder of the 15-mile surface water pathway from the site.

The western drainage pathway consists of a ditch that flows east through the Chisholm subdivision and north along the eastern perimeter of the City of Montgomery Zoo. This ditch flows north from the zoo and flows into an unnamed creek. The unnamed creek flows approximately 4.9 miles to the north and flows into the Alabama River. The Alabama River makes-up the remainder of the 15-mile surface water pathway from the site.

The unnamed creek, the unnamed tributary of Three-Mile Branch, Three-Mile Branch, and Galbraith Mill Creek are not listed in the ADEM Admin. Code R. 335-6-11-.02 with a use classification; however, it is noted in the regulations that segments not listed should be designated as fish and wildlife. Low flow data was not available for the unnamed creek, the unnamed tributary of Three-Mile Branch, Three-Mile Branch, and Galbraith Mill Creek (Hayes, 1978). The unnamed creek, the unnamed tributary of Three-Mile Branch, Three-Mile Branch, and Galbraith Mill Creek are minimal streams and the low flow rates for these streams are estimated to be less than 10 cfs.

The Alabama River is listed in the ADEM Admin. Code R. 335-6-11-.02 with a use classification of fish and wildlife for the section along the 15-mile surface water pathway from the site, and has a seven day ten year low flow rate of 5,120 cfs and a seven day two year low flow rate of 6,980 cfs (Hayes, 1978).

Wetlands are present along both of the surface water drainage pathways from the site. Approximately 0.76 miles of frontage of wetlands are present along the eastern surface water pathway, and approximately 3.4 miles of frontage of wetlands are present along the western surface water pathway. A total of 4.2 miles of wetland frontage (Figure 4) are present along the surface water pathway from the site. No known surface water intakes for public drinking water supplies are located along the 15-mile surface water pathway from the site.

SOILS

The majority of soils mapped at the site are classified by the Soil Conservation Service as Amite fine sandy loam. Soils in this classification are deep, well drained, level to strongly sloping soils that developed from old alluvium that washed from soils of the Coastal Plain. Generally the surface layer consists of a dusky-red or dark-brown to grayish-browns fine sandy loam, and the subsoil consists of a red to dark-red sandy clay loam to sandy clay. Amite soils are underlain by sand and gravel at depths that range from 3 to 10 feet. The permeability of these soils is moderate to moderately rapid, and they have a slope of 0 to 5 percent (Burgess, et al., 1960).

GEOLOGY

Geologic units exposed in Montgomery County are of Cretaceous and Quaternary age and consist chiefly of sand, chalk, gravel, and clay. The units, from youngest to oldest, are: Quaternary alluvial deposits; the Selma Group; the Eutaw Formation; and the Tuscaloosa Formation (Scott, et al., 1987).

The geologic unit that outcrops in the vicinity of the site is a Quaternary alluvial deposit (Figure 5). This unit consists of gravel, sand, silt, and clay that underlie flood plains of present and ancestral large streams. Alluvial deposits range in thickness from 30 to 80 feet thick. The Selma Group is not present in the subsurface at the site. (Scott, et al., 1987).

The Eutaw Formation underlies the Quaternary alluvial deposit in the vicinity of the site and consists of upper and lower zones of marine sands. The upper zone consists of up to 150 feet of massive glauconitic sand interbedded with calcareous sandstone and sandy limestone. The lower zone consists of approximately 30 to 50 feet of glauconitic sand interbedded with sandy clay. Approximately 50 to 150 feet of calcareous clay and sandy clay separate the two zones (Scott, et al., 1987).

The Tuscaloosa Group underlies the Eutaw Formation, and is composed of the Gordo and the Coker Formations west of the Tallapoosa River. East of the Tallapoosa River the Gordo and Coker Formations are grouped together as the Tuscaloosa Group undifferentiated. The Gordo Formation consists of a basal zone of gravelly sand that is overlain by alternating lenticular beds of sand and mottled clay. The Gordo Formation is approximately 100 to 300 feet thick and is underlain by the Coker Formation. The Coker Formation ranges in thickness from less than 100 feet to 1000 feet and is divided into a basal zone and an upper zone. The basal zone consists of nonmarine gravel, sand, and clays. The upper zone consists of marine sand and clay beds. Approximately 50 feet of clay separate the two zones. Igneous and metamorphic crystalline rocks underlie the Coker Formation (Scott, et al., 1987).

The site is not located in an area that is underlain by limestone or other types of rocks that are susceptible to karst development.

HYDROGEOLOGY

The groundwater aquifers that have recharge areas in the vicinity of the city of Montgomery include the Watercourse aquifer, the Eutaw aquifer, the Gordo aquifer, and the Coker aquifer. The site is located in the recharge area of the Watercourse aquifer (Moore, 1992). The Watercourse aquifer is composed of alluvial deposits and is hydraulically interconnected with the Eutaw aquifer. The Eutaw aquifer, the Gordo aquifer, and the Coker aquifer are separated by confining layers of clay and are not interconnected. The source of recharge for these aquifers is rainfall. Of the 50 inches of annual rainfall, approximately 4 to 5 inches infiltrates to serve as aquifer recharge (Scott, et al., 1987).

Groundwater flow in the vicinity of the site is has been documented to flow from the central portion of the site to the northeast, north, northwest, west and southwest. The depth to the water table at the site is ranges from to 12.60 feet to 23.19 feet below land surface (TTL, Inc., 1999).

There are 17 public water supply wells located within 4 miles of the site (Figure 6). The closest active public water supply well is operated by the Montgomery Water Works and Sewer Board, and is located approximately 1.04 miles to the southwest of the site. Six of these public water supply wells (# 2, 9E, 9W, 15, 18, and 20) are not in use due to contamination or the potential of contamination. All of the closed wells are located in the north well field, were less than 100 feet deep, and were screened in Quaternary terrace deposits or the Eutaw Formation. The site is not located in a wellhead protection area, but a wellhead protection area is located with in four miles of the site (CH2M Hill, 1997). Private water supply wells are not expected in the immediate vicinity of the site due to the urban nature of the site; however, private wells may be present within four miles of the site in the more rural areas.

CLIMATE

The climate of Montgomery County is considered to be nearly subtropical with an average annual temperature of 65.4°F. The average temperature during the summer is 80.6°F, and the average temperature during the winter is 50.1°F (Burgess, et al., 1960). The average annual rainfall is 50 inches, and approximately 17.5 of the 50 inches of rain per year runs off into the streams (Willmon, 1980).

cc: Jymalyn Redmond, Chief, Site Assessment Unit

SELECTED REFERENCES

- Burgess, Leland H., Wilson, C.S., McBride, E.H., Anderson, J.L., and Dahms, K.E., 1960, Soil Survey of Montgomery County, Alabama, United States Department of Agriculture, Soil Conservation Service.
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- Scott, John C., Cobb R. H., and Castleberry, R. D., 1987, Geohydrology and Susceptibility of Major Aquifers to Surface Contamination in Alabama; Area 8, United States Geological Survey, Water Resources Investigation Report 86-4360.
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GROUNDWATER ROUTE WORKSHEET REQUIREMENTS

Route Characteristics

<u>Aquifer of concern</u>	Watercourse aquifer Eutaw aquifer
<u>Gross Precipitation</u>	50 inches
<u>Net Precipitation</u>	6 inches (from HRS)
<u>Depth to Aquifer</u>	0 to 25 feet
<u>Slope</u>	2 to 5 percent
<u>Permeability of Unsaturated Zone</u>	4.2×10^{-4} to 4.2×10^{-3} cm/sec.
<u>Is the Site Susceptible to Karst</u>	No

TARGETS

Groundwater use - There are 17 public water supply wells located within four miles of the site.

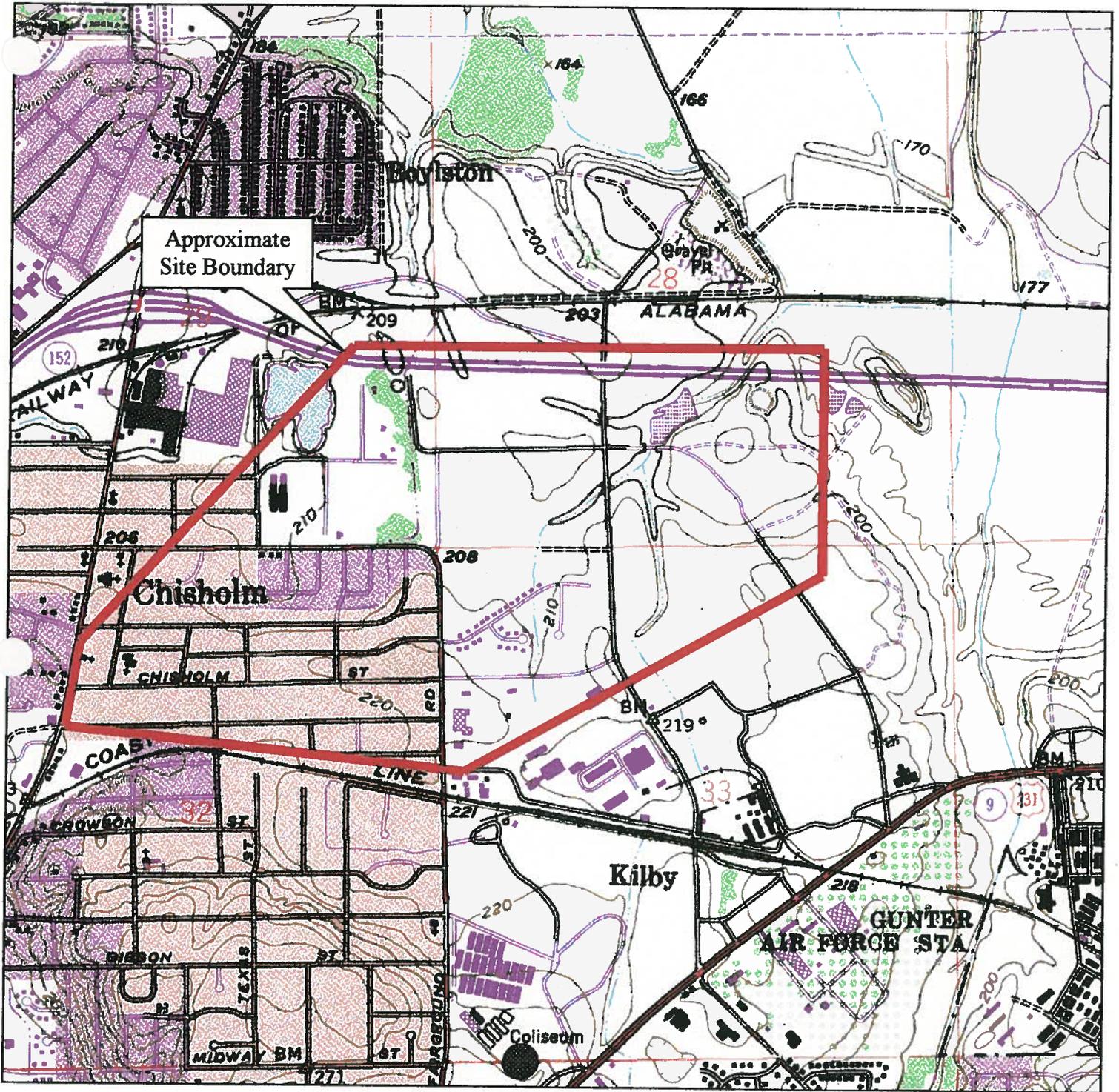
Distance to nearest public supply well - 1.04 miles.

Coliseum Boulevard Plane



Figure 1

Site Location Map



Feet



Coliseum Boulevard Plume
Montgomery, Montgomery County, Alabama

Montgomery North, Alabama

U.S.G.S. Topographic Map

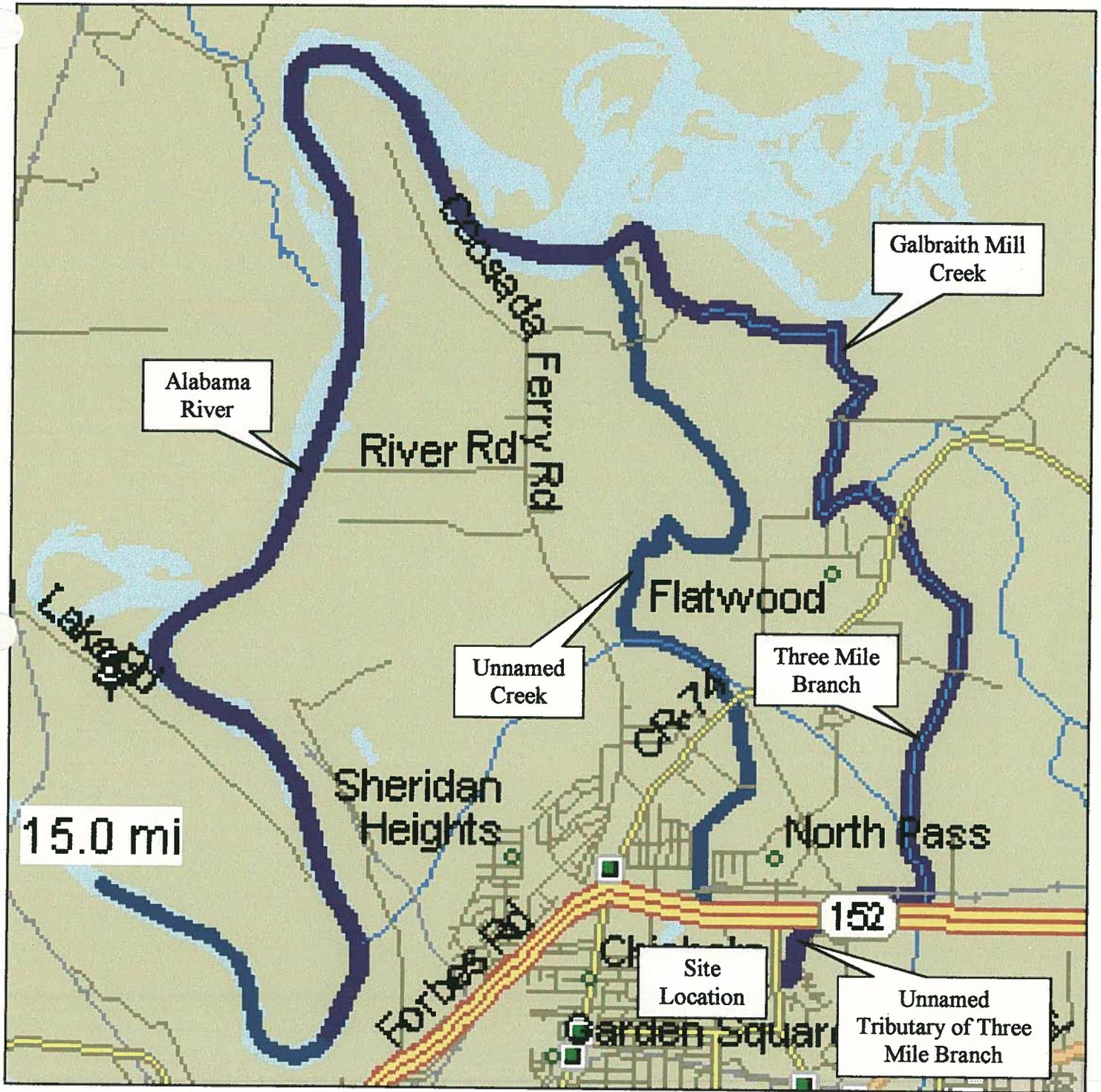
1958

Photorevised 1981

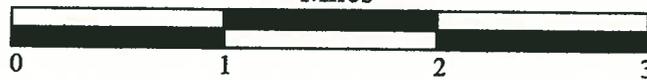


Figure 2

15-Mile Surface Water Pathway Coliseum Boulevard Plume

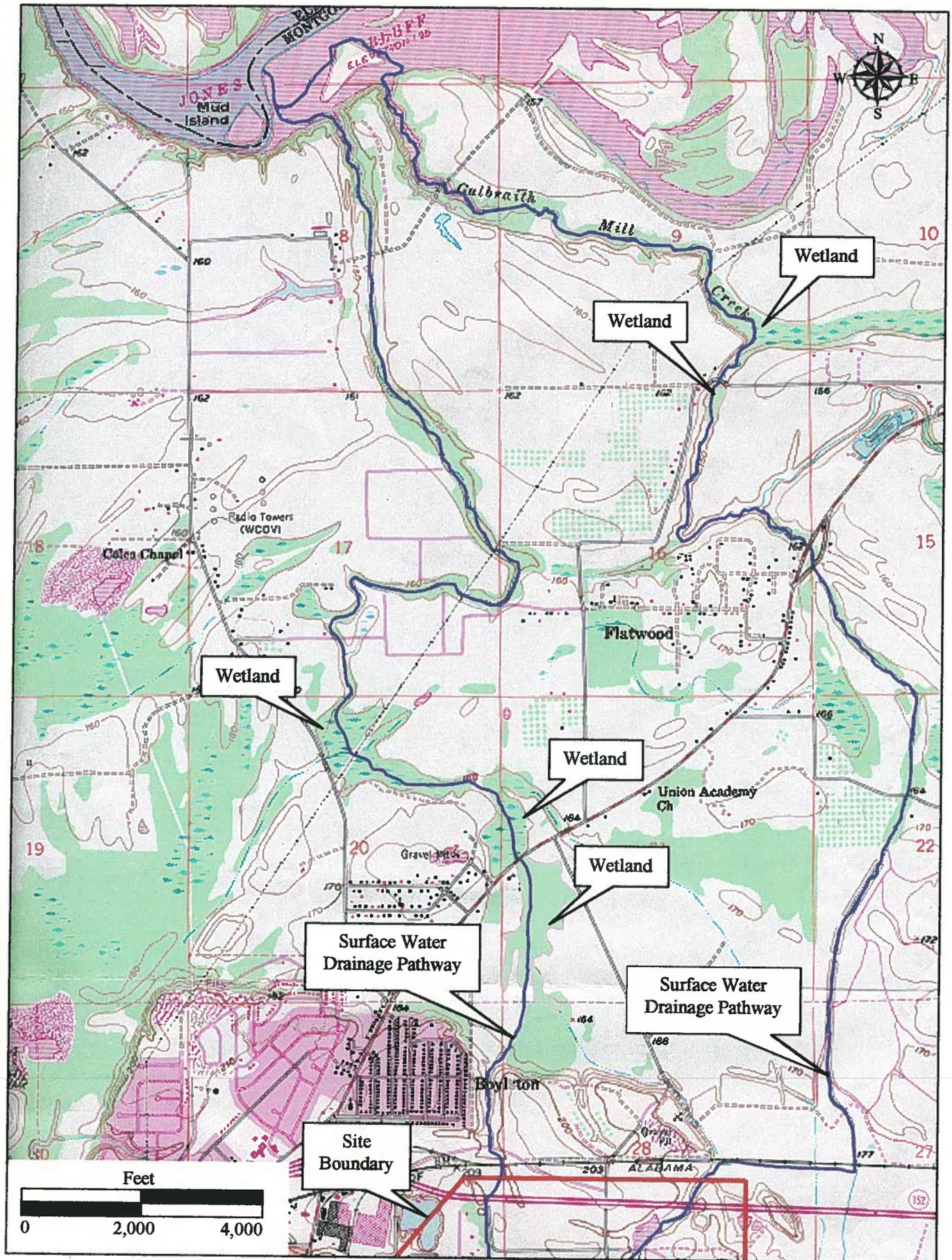


Miles



Base Map – Streets 2000
Microsoft Corporation 1988 – 1999

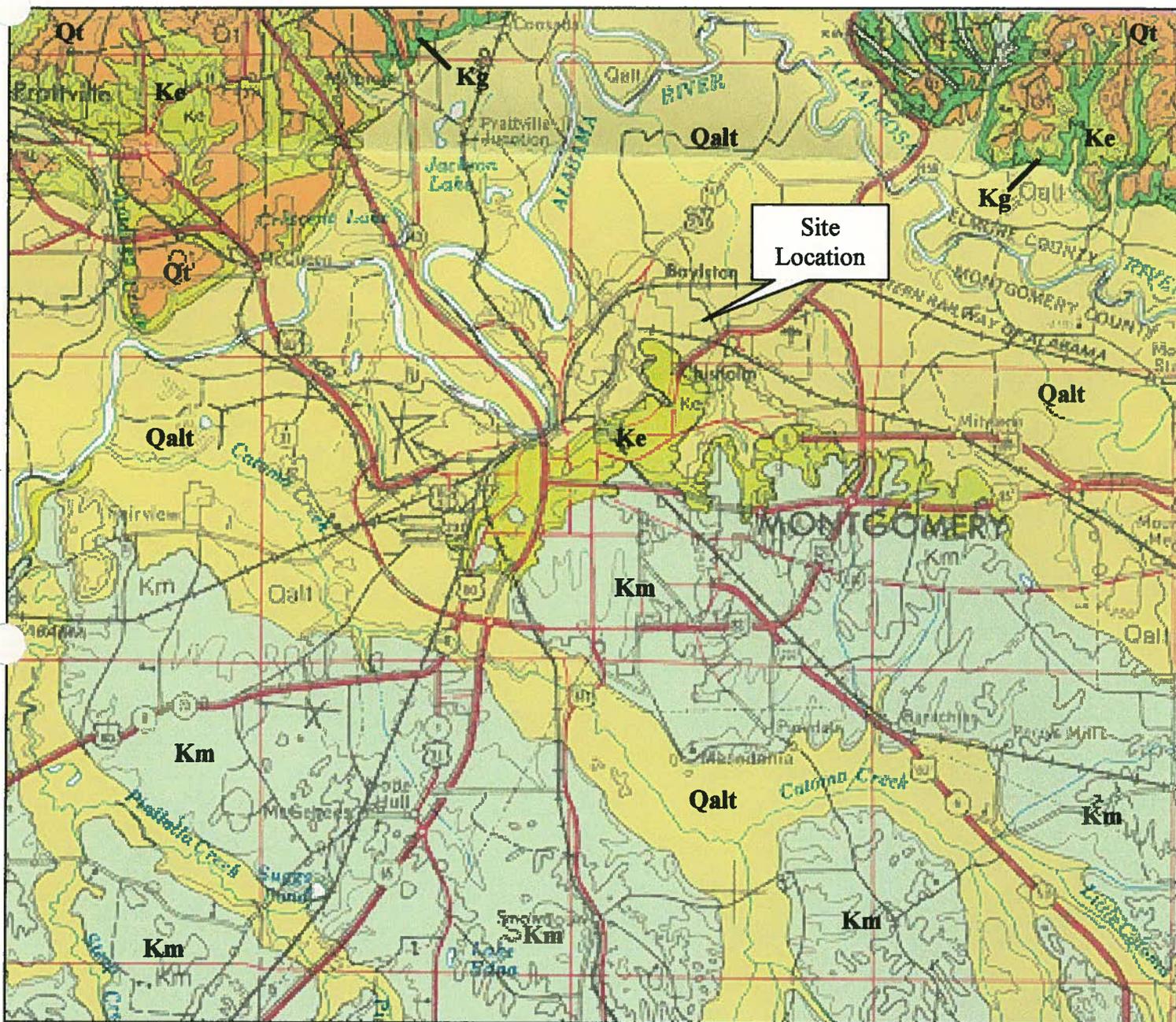
Figure 3



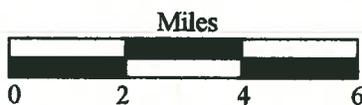
Identified Wetlands Along the Surface Water Pathway – Coliseum Boulevard Plume
 Base Map – USGS Topographic Map – Montgomery North

Figure 4

Geologic Units Mapped at the Coliseum Boulevard Plume



- Qalt - Alluvial & low terrace deposits
- Qt - High terrace deposits
- Km - Mooreville Chalk
- Ke - Eutaw Formation
- Kg - Gordo Formation

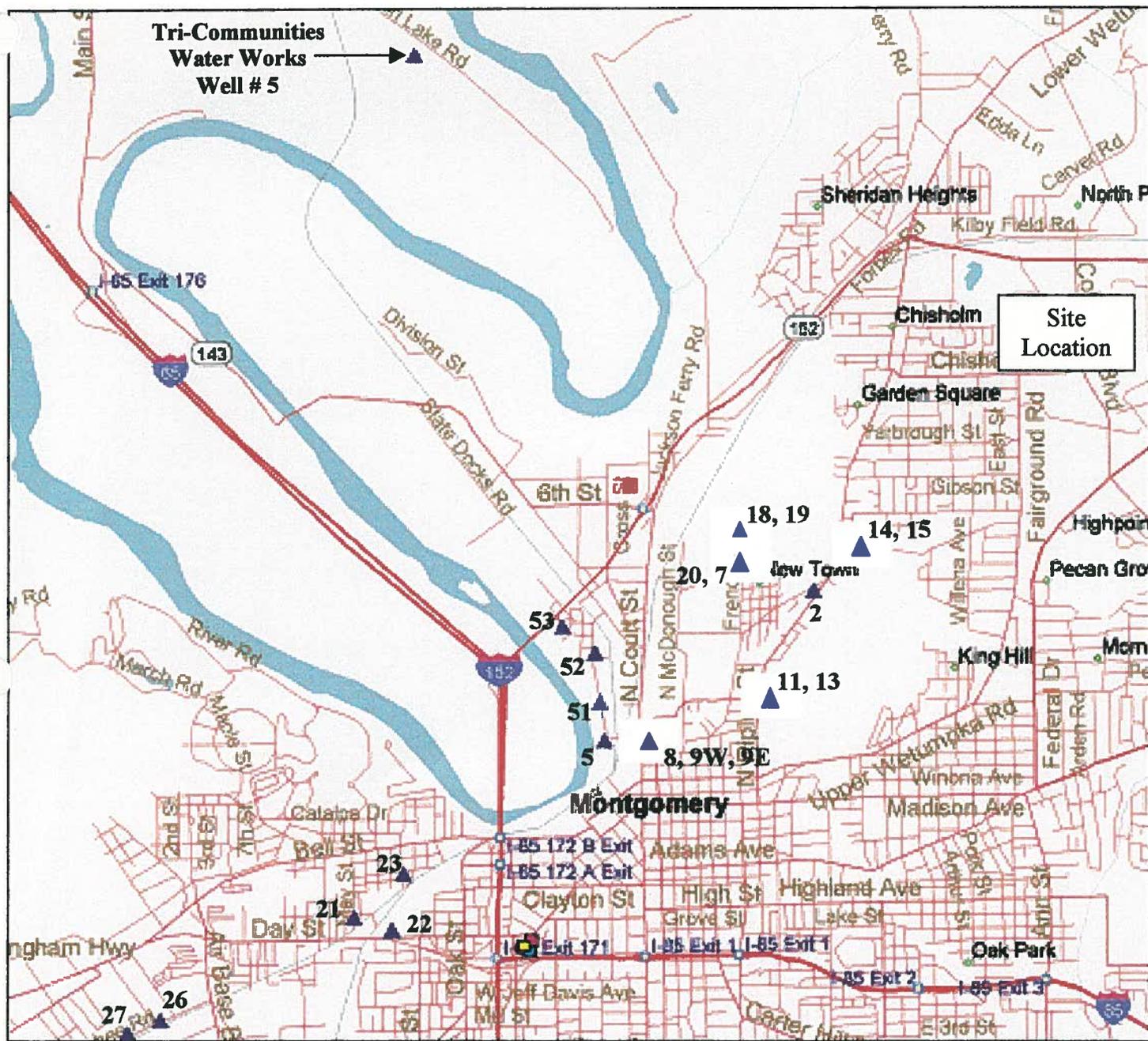


Geologic Map of Alabama
Southwest Sheet 1988

W.E. Osborne, Michael W. Szabo, Thornton L. Neathery, and Charles W. Copeland Jr.
Geological Survey of Alabama Special Map 220

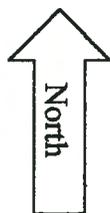
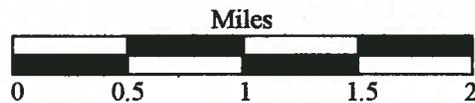
Figure 5

Public Water Supply Wells in the Vicinity of the Coliseum Blvd. Plume Site



▲ - Public Water Supply Well

Unless otherwise noted all wells belong to the City of Montgomery Water Works and Sanitary Board.



Base Map – Streets98
 1988-1997 Microsoft Corporation
 Well Information – GPS Data
 Collected by Alabama Department of Environmental
 Management Personnel

Figure 6

REFERENCE 3

REFERENCE 4