34800

PRELIMINARY ASSESSMENT

FOR

PALM HARBOR HOMES
WINDER, BARROW COUNTY, GEORGIA

EPA ID No. GAR000003046

NFRAP
11/19/96

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August 15, 1996

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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), the Georgia Environmental Protection Division conducted a Preliminary Assessment (PA) at Palm Harbor Homes (currently occupied by Athana "Athens/Atlanta Warehouse") in Barrow County, Georgia. 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 CERCLA/SARA or other appropriate action. The scope of the investigation included review of available file information, a comprehensive target survey, and an on-site and off-site reconnaissance (Appendix 1).

2. SITE DESCRIPTION, OPERATIONAL HISTORY, WASTE CHARACTERISTICS, AND RELEASE OF HAZARDOUS MATERIALS TO THE ENVIRONMENT

2.1 Location

The Palm Harbor Homes site is located at 976 Airport Road, Winder, Barrow County, Georgia (Figure 1). The geographical coordinates are 33°, 58', 45.8" North Latitude and 83°, 39', 43" West Longitude as shown on the United States Geological Survey (USGS) Quadrangle Topographic Map (Appendix 2). The site is in an industrial area and bounded on one side by an airport runway.

The area is characterized by a mild climate. Summers are hot and humid with daily temperatures reaching 95° F or higher. The winters are generally mild with daily minimum temperatures as low as 32° F. Mean annual precipitation is approximately 51 inches (Reference 1).

2.2 Site Description

The site consists of one large building and its grounds enclosed by a cyclone fence (Sketch, Appendix 1). The building is currently being used as a warehouse for fiber insulation. The interior of the building shows no evidence of spills. A railroad spur line enters the property from the southeast side and extends up to the northeast side of the building. Within the fenced area at the southeast end of the site a spill of hardened black roofing tar(?) was noted. On the southeastern end of the warehouse there is an nonworking cyclone. Near the cyclone, there are three empty drums and a residue from a spill. The residue is a resin-like material. Adjacent to the spill area were the remains of one almost completely rusted drum. There were no identifying markings on any of the drums. On the north side of the warehouse, an overturned drum was found. Beside the drum there was a dark-brown tough residue on the ground surface. On the north side of the site, near the northwest corner of the warehouse there are seven monitoring

Figure 1 Site Location

0 1 2 miles

Athens 1:100,000

wells, a fire hydrant, the site of a removed UST estimated at 1500 gal. capacity, and an above-ground tank estimated to have a 300 gallon capacity. Near the gate on the northwest side of the warehouse is located a fire hydrant, and one monitoring well inside the fence and one monitoring well outside the fence. Also near this gate but just outside the property line is one monitoring well and the site where a UST had been removed. The site utilizes City of Winder public water.

2.3 Operational History and Waste Characteristics

The site was used as a production facility for the manufacture of mobile homes from the late 1960's to 1989. Palm Harbor Homes occupied the site from 1980 to 1989. Prior to 1980 the site was occupied by Wicks Mobile Homes. The facility is presently used by Athana to warehouse fiber insulation. According to the Phase 1 Environmental Assessment, the production of mobile homes required the use of paint, asphalt/tar, and other chemicals. According to a hazardous waste manifest (state manifest document No. 92620) some of the regulated chemicals within some of the drums removed from the site were mineral spirits, alcohol, varnish, and waste paint related material. The Phase 1 Environmental Assessment (1994) reported that an AST on the site contained a liquid which had a petroleum odor and that one drum present at the site was labeled as containing methyl cellulose and another drum was labeled anti-icing biocidal solution. From the analysis of soil and groundwater samples, the 1994 Phase II Limited Site Investigation found that a release of petroleum products had occurred at the site.

2.4 Release of Hazardous Materials to the Environment

The only evidence of release of hazardous materials (covered by CERCLA) to the groundwater are two patches of unanalyzed residue on the soil surface and several empty overturned drums, some of which are rusted out. However, it is known that several drums removed from the site, contained hazardous material (see section 2.3) and in the interest of a conservative evaluation it was considered that there has been a suspected release to groundwater and soil at the site. In 1994, for a Phase II Limited Site Investigation, soil and groundwater samples were analyzed for total petroleum hydrocarbons (TPH) and for the gasoline constituents benzene, ethylbenzene, toluene, and xylenes (BTEX). The Phase II investigation found that a release of petroleum products has occurred at the site, however, evaluation of petroleum products releases is not a responsibility of CERCLA.

3. GROUNDWATER PATHWAY

3.1 Hydrogeologic Setting

The site is located in the Piedmont Physiographic Province (Reference 2) on the edge of a small area of relatively flat upland. The southwestern edge of the site intersects the edge of a small valley of Barber Creek and drainage from the site enters an intermittent

stream which down stream forms the headwater of Barber Creek and later empties directly into the headwaters of Barber Creek. The area of the formentioned intermittent stream is a swampy area adjacent to the site. The bedrock of the area is granite gneiss (Reference 3) and according to the Phase I Environmental Assessment the soils of the area are well-drained. The uppermost aquifer at the site is the water table aquifer and the depth to groundwater is approximately 10 feet. The most probable path for groundwater at the site is to percolate through the surficial residual soils and then migrate through the saprolite and fractured bedrock. Based on observations of the topographic map of the area, and assuming that the groundwater flow will follow the slope of the land, the groundwater flow from the site is to the southeast.

3.2 Groundwater Targets

The Georgia EPD GIS well use database (Table 1) was used to access water use because it is thought to contain the most current data. The results of the CENTRACTS well use report are in Appendix 3, but were not used for the calculations. There are 2027 people that are served from wells located within a four mile radius, with the bulk of the well use being from public wells. The GIS database search found three public wells (Figure 2) within the four mile radius.

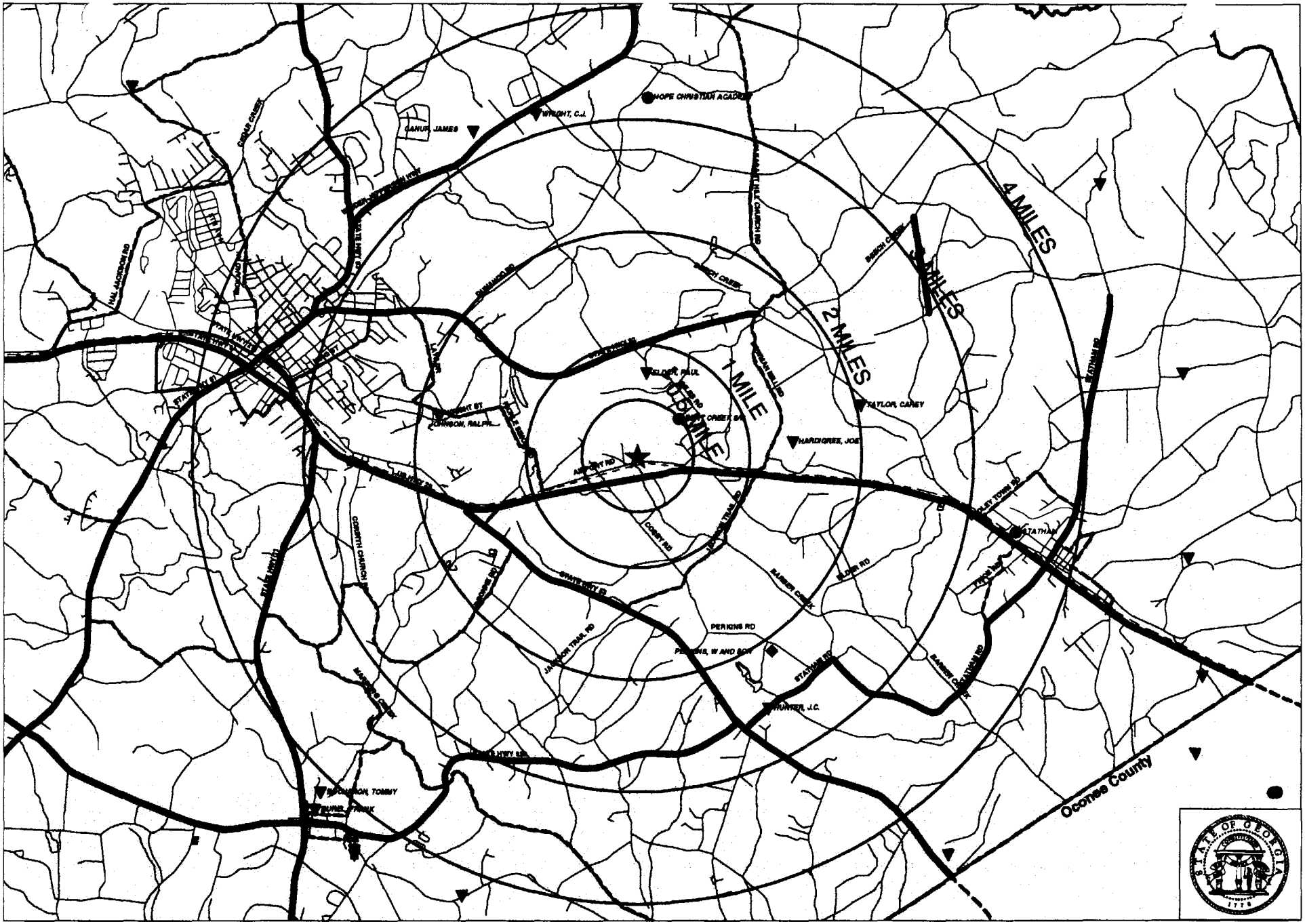
Table 1 EPD GIS Well Use Data Base for Palm Harbor Site

Miles from site	Population (Cumulative)	Housing units (Cumulative)
0.00 - 0.25	32.2	28.5
0.25- 0.50	69.8 (102)	28.5 (42)
0.50 - 1.00	271.3 (373.3)	108.8 (150.8)
1.00 - 2.00	1341.9 (1715.2)	517.2 (668)
2.00 - 3.00	3432 (5147.2)	1296.3 (1964.3)
3.00 - 4.00	5862.7 (11,009.9)	2499.9 (4464.2)

A call to the Town of Statham (Reference 4), shown as one of the public supply wells, revealed that the supply is a blended system consisting of two springs (groundwater resources) and one lake (not in the surface water pathway). A call to another public well (Reference 5) within the four mile radius revealed that owner (Hope Christian Academy) had discontinued use of the well and is on another water system. The third public well is located 1/2 miles from the site. This well is owned by Athens Plumbing and Well and serves the nearby Bent Creek Subdivision (Reference 6).

For purposes of a conservative calculation public well users in the Bent Creek Subdivision (1/2 miles from the site) were counted as being within the 1/2 mile radius.

Figure 2 GIS Well Locations



Census Block Group with >zero non-public supply well
Census Block Group served by public water
Public Supply Well
Surface Water Intake
Domestic Well
Unused Well
Spring
Industrial Well
Commercial Well
Irrigation Well
Livestock well
Well - Unknown use
Other Well
County Boundary
Road
Major Highway
Stream/River
Railroad

6/12/96

PALM HARBOR HOMES
WINDER, BARROW COUNTY
0.5, 1, 2, 3, and 4 MILE RADII

SOURCES: Georgia Public Water Source Inventory, 1994; US Census Bureau 1990; Ga. Water Source Inv., USGS, 1995

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There is only one domestic well located within the four mile radius, however, there are seven wells of unknown use, which for purposes of a conservative calculation of users, were counted as domestic wells. Table 2 shows the distribution of groundwater users within the four mile radius of the site.

Table 2 Population and Drinking water (GIS Data)

Water Usage	Distance From Site (Miles)						
	0-.25	.25-.50	.50-1.0	1.0-2.0	2.0-3.0	3.0-4.0	Total
Total Population	0	106	2	5	7	1907	2027
Population on Private Wells	0	0	2	5	7	5	19
Population on Public Wells	0	106	0	0	0	1902	2008

3.3 Groundwater Pathway Conclusions

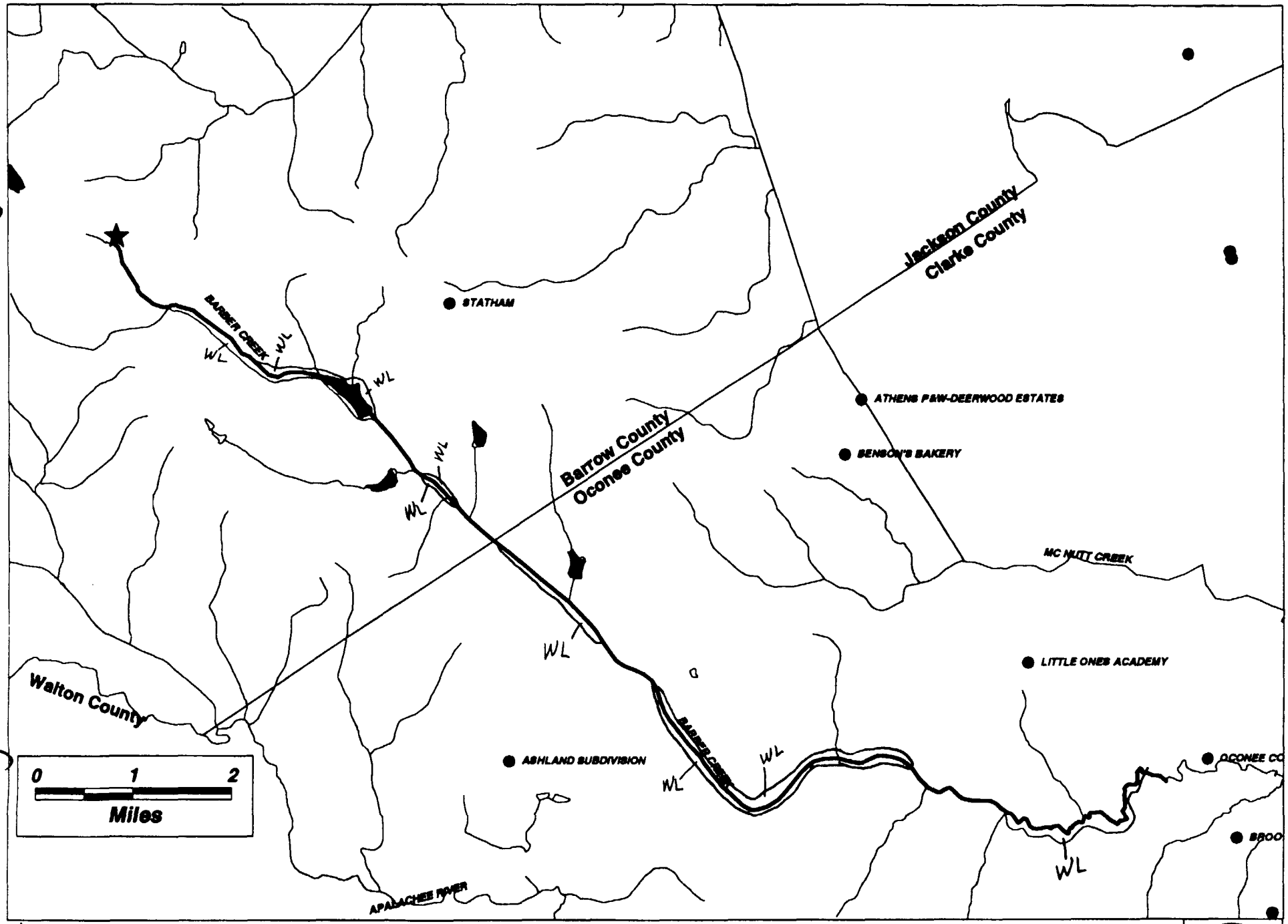
The vast majority of the water users within four miles of the site are on public water, with only 19 people using private wells. However, one half mile from the site there is one public well which serves 106 individuals. Based on the predicted groundwater flow direction the 106 individuals served by this well are in no danger of being affected by groundwater pollution originating at the site. Considering the small amount of pollutant suspected of being released at the site there is only a slight chance of groundwater users being affected by the release at the site.

4. SURFACE WATER PATHWAY

4.1 Hydrologic Setting

Figure 3 shows the surface water pathway for fifteen miles downstream from the probable point of entry (PPE) of contaminants from the site. The nearest surface water is Barber Creek which is about 50 feet from the site. Surface water leaves the site by two paths, one of which flows from a drainage ditch into a swampy area that contains an intermittent stream. The intermittent stream from the swamp flows to join the other surface water path (another drainage ditch from the site), where their combined flow is the headwaters of Barber Creek. The flow rate of the stream was considered to be the flow rate of the stream at the PPE. Since the water flowing through the swampy area is intermittent, the swampy

Figure 3 Surface Water Pathway



Site Location
Surface Water Intake
Public Supply Well
Downwater Pathway
River/Stream
Lake/Pond
WL Wetland
County Boundary

PALM HARBOR HOMES 15 MILE DOWNWATER PATHWAY
PALM HARBOR HOMES SITE - WINDER, BARROW COUNTY

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area is considered to be a soil and will be included within the soil pathway. The site misses being in the 100-year floodplain by a distance of less than 100 feet (Appendix 4). A 500-year floodplain has not been determined for the site area.

4.2 Surface Water Targets

Most of the water users of the area are served by the City of Winder (Reference 7). However, the City of Winder obtains its water from inlets on Mulberry River and Cedar Creek, neither of which are influenced by surface water from the site. No public water intakes within 15 miles of the site were indicated by the EPD GIS data search. The surface water targets are 1)- fishery of Barber Creek, and 2)- approximately six miles of palustrine wetlands (Reference 8) along Barber Creek (Figure 3).

4.3 Surface Water Pathway Conclusions

The site has suspected releases of hazardous material with no actual measurement of the hazardous materials in any of the pathways. If there was release of hazardous materials at the site there is a strong possibility that some of this material would be transported by drainage from the site to surface water. In addition to this source of hazardous material, the close proximity of the stream to the site enhances the possibility that there may be some recharge of Barber Creek by groundwater bearing hazardous material. There is no direct risk of exposure to humans, only indirect through the fishery of Barber Creek. Considering the small amount of hazardous material suspected to have been released and the dilution of Barber Creek, the chance of impact upon wetlands along Barber Creek is minimal. The overall threat to the surface water pathway is moderate.

5. SOIL PATHWAY

5.1 Physical Condition

The site is completely enclosed by a cyclone fence. The fence has two gates one of which is locked and the other which is left open during working hours and locked during nonworking hours. The soil is grassed except in the vicinity of the removed USTs, where digging has removed the grass. Except for the two small residue patches there was no evidence of inhibited growth or damage of plants at the site. There is a swampy area adjacent to the site.

5.2 Soil Pathway Targets

There are currently 9 on-site workers and no on-site residents. The nearest residence is approximately 700 feet from the site. The site is located in a small industrial area with nearby residential areas. The total population within four miles of the site is 11,010. There are no schools or day care facilities within 200 feet of the site.

Adjacent to the southwest side of the site there is a swampy area which receives some of the surface drainage from the site. Since the stream flowing through the swamp is intermittent, the swamp can not be placed in the surface water pathway and is in this document considered to part of the soil pathway. Physically this swampy area could be considered a wetlands, however, the soil pathway is limited to terrestrial sensitive environments and wetlands are not included in terrestrial sensitive environments. No threatened or endangered species are known to be in the vicinity of the site (Appendix 5).

5.3 Soil Pathway Conclusions

Considering that only a small number of people are ever on the site, that the site has limited access, and that the spill area on the soil was very small the threat to the soil pathway is very small.

6. AIR PATHWAY

6.1 General Observations

Although the site was used in the past for manufacturing operation which might have produced air pollution, for the past several years the site has been used only as a warehouse (Appendix 1).

6.2 Air Pathway Targets

There are currently 9 on-site workers and no on-site residents (Appendix 1). The nearest residence is approximately 700 feet from the site (Appendix 2). The site is located in a small industrial area with nearby residential areas. The total population within four miles of the site is 11,010 (Table 2, page 7). There are no schools or day care facilities within 200 feet of the site.

6.3 Air Pathway Conclusions

Since the site is currently being used only as a warehouse, there is no exposure of anyone in the air pathway to air contamination originating from the site.

7. CONCLUSIONS

No contaminations (covered by CERCLA) have been determined for the site. There is evidence of spillage from two drums with unknown contents. Since hazardous materials are known to have been stored in drums at the site it was assumed that there was some small release of hazardous materials. If there has been a release of hazardous materials at the site, the quality of the groundwater and surface water may have been impacted.

8. REFERENCES

1. Average Annual Rainfall and Runoff in Georgia, 1941-1970, Robert Carter and Harold Stiles, Georgia Geologic Survey, 1983, Hydrogeologic Atlas 9.

2. Physiographic map of Georgia, W. Z. Clark and A. C. Zisa, 1976, Georgia Geologic Survey.

3. Geologic map of Georgia, 1976, Georgia Geologic Survey.

4. Phone Call to Town of Statham, week of June 10th, 1996.

5. Phone Call to Hope Christian Academy, week of June 10th, 1996.

6. Phone Call to Athens Plumbing and Well, week of June 10th, 1996.

7. Phone Call to City of Winder, week of June 10th, 1996.

8. National Wetlands Inventory of Winder South, Statham, and Athens West quadrangles, Fish and Wildlife Service, U.S. Department of the Interior.

APPENDIX 1

Georgia Department of Natural Resources

205 Butler Street, S.E., Suite 1462, Atlanta, Georgia 30334
Lonice C. Barrett, Commissioner
Environmental Protection Division
Harold F. Reheis, Director
404/657-8600

April 29, 1996

TRIP REPORT

SITE NAME AND LOCATION: Palm Harbor Homes (currently occupied by Athana "Athens/Atlanta Warehouse") Winder, Georgia

EPA ID NUMBER: GAR000003046

TRIP BY: John Hetrick JHH
Senior Geologist

ACCOMPANIED BY: Alexandra Cleary
Unit Coordinator

DATE OF TRIP: April 24, 1996

OFFICIALS CONTACTED: Dennis Smith
Manager of Athana

PURPOSE OF TRIP: Preliminary Assessment

COMMENTS:

This inspection is a follow up of a site inspection by EPD in January 13, 1995 which found that the former occupant of the site (Palm Harbor Homes) had left eighteen 55-gallon drums, one small 300-gallon tank, and two 5-gallon buckets of waste at the facility. Palm Harbor Homes operated a mobile home manufacturing facility until 1989 at the site. This inspection was conducted as a preliminary assessment at the request of EPA. The current occupant of the site, Athana, has been leasing the property for the past five years and uses the building to warehouse fiber insulation.

INSPECTION:

The inspection consisted of performing a visual inspection of the grounds formerly used by Palm Harbor Homes. A walk-through of the buildings revealed no stains or other evidence of spillage of hazardous materials by previous or present occupants. Outside of the warehouse, it was noted that drainage from the northwestern side of the site flows southward (see attached diagram) where the drainage travels via culvert under the road and railroad tracks and from there flows to a lake located southeast of the site. Surface

drainage from the southeast side of the site also flows south under the road via culvert and then to the lake southeast of the site. According to Dennis Smith, the current manager of the rented warehouse, the facility is on public water and two fire hydrants were observed on the site (one at western end of site and one north of warehouse). The site is within a fenced area with one gate at the western end of the warehouse and one on the southern boundary of the property. Adjacent to the northeast side of the site is an airport runway.

An unmarked 55 gallon drum was found outside the fenced area at the southeastern corner of the site. The drum was closed and intact and based on its weight it is probably empty. Within the fenced area at the southeast end of the site a spill of hardened black roofing tar(?) was noted. On the southeastern end of the warehouse there is an nonworking cyclone. Near the cyclone, there are three empty drums and a residue from a spill. The residue is a resin-like material. Dennis Smith, who accompanied us on part of the site inspection, said that the drum which had contained the spilled material had been removed. Adjacent to the spill area were the remains of one almost completely rusted drum. There were no identifying markings on any of the drums. On the north side of the warehouse, an overturned drum was found. Beside the drum there was a dark-brown tough residue on the ground surface. On the north side of the site, near the northwest corner of the warehouse there are seven monitoring wells, a fire hydrant, the site of a removed UST estimated at 1500 gal. capacity, and an above-ground tank estimated to have a 300 gallon capacity. Near the gate on the northwest side of the warehouse is located a fire hydrant, and one monitoring well inside the fence and one monitoring well outside the fence. Also near this gate but just outside the property line is one monitoring well and the site where a UST had been removed.

During a drive around, houses located less than 1&1/2 miles from the site were found in all directions from the site. The closest concentration of houses were those along GA Hwy. 8 (less than 1/4 mile south of the site) and a new subdivision (1/2 miles west of the site). Based on information obtained from an inhabitant of the subdivision it is believed that most of the houses in the subdivision have their water supplied by a public water system (Athens Plumbing and Well). We were not able to determine if all of the houses near to the site were on public water.

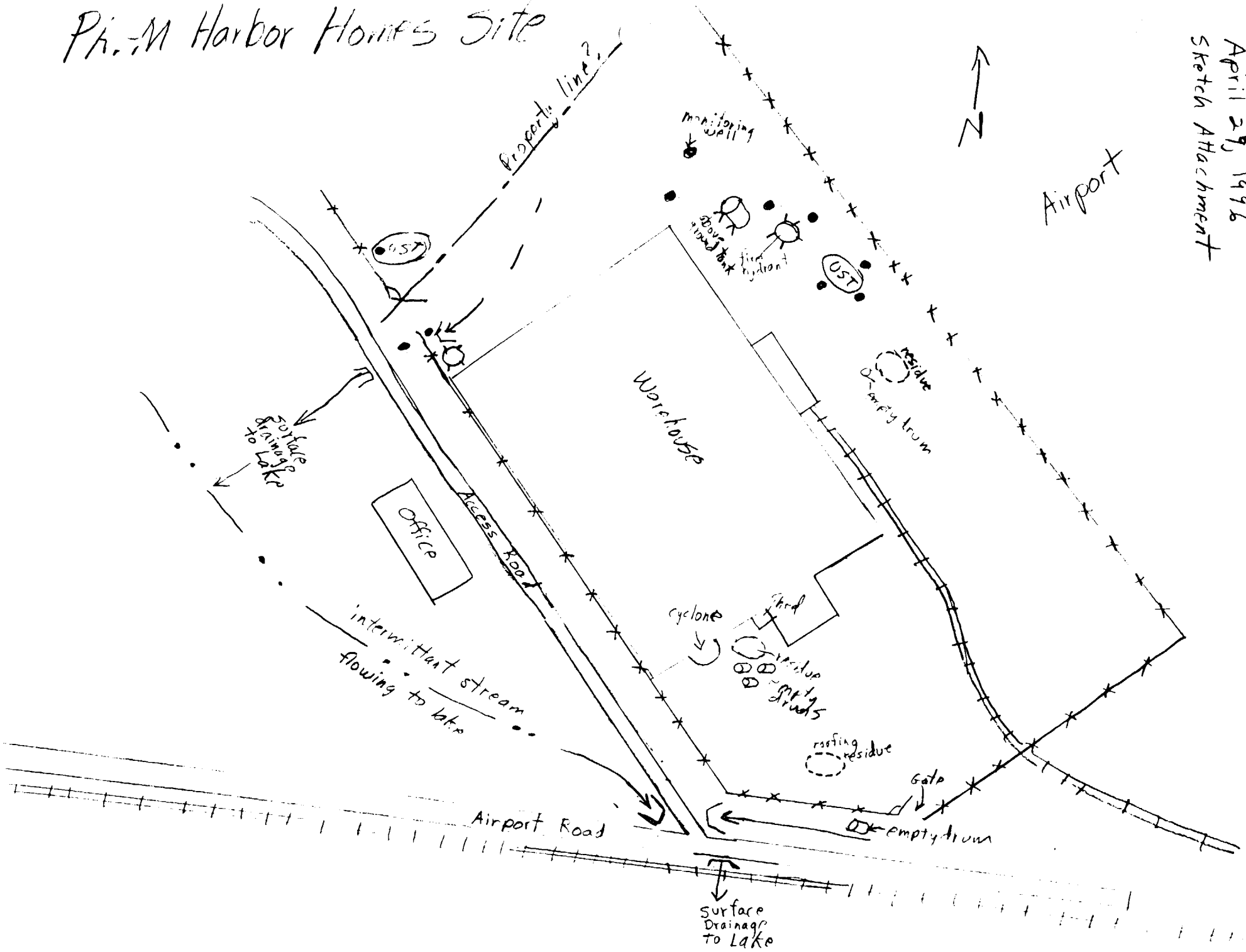
REVIEWED BY: ay C

Attachments- Sketch of site

R:\JOHNH\PALMH.TPR

Pk.-M Harbor Homes Site

Trip Report
April 29, 1996
Sketch Attachment



OVERSIZED

DOCUMENT

FROST ASSOCIATES

APPENDIX 3

P.O. Box 495, Essex, Connecticut 06426
(860) 767-7644 FAX (860) 767-1971

June 18, 1996

To: Environmental Protection Division
205 Butler St., Floyd Towers East, Suite 1154
Atlanta, GA 30334

Attn: James Ussery

Fr: Frost Associates
P.O. Box 495
Essex, Conn 06426

Tel: (203) 767-1254
Fax: (203) 767-7069

Sub: Palm Harbor Homes
976 Airport Rd, Winder, GA

Site Longitude: 83-39-43 83.661942
Site Latitude : 33-58-45.8 33.979389

The CENTRACTS report below identifies the population, households, and private water wells of each Block Group that lies within, or partially within, the 4, 3, 2, 1, .5, and .25, mile "rings" of the latitude and longitude coordinates above. CENTRACTS may have up to ten radii of any length. 1000 block groups, and 15000 block group sides.

CENTRACTS uses the 1990 Block Group population and Block Group house count data found in the Census Bureau's 1990 STF-1A files. The sources of water supply data are from the Bureau's 1990 STF-3A files. The boundary line coordinates of the Block Groups were extracted from the Census Bureau's 1990 TIGER/Line Files.

CENTRACTS reports are created with programs written by Frost Associates, P.O. Box 495, Essex, Conn. The code was written using Microsoft's Quick-Basic Ver. 4.5.

Latitude and Longitude coordinates identifying a site are entered in degrees and decimal degrees. One or more county files holding Block Group boundary lines are selected for use by CENTRACTS by determining whether the site coordinates fall within the minimum and maximum Lat\Lon coordinates of each county in the state.

Each Block Group line segment has Lat\Lon coordinates representing the "From" and "To" ends of that line. All coordinates from the selected county files are read and converted from degrees, decimal degrees to X\Y miles from the site location. Each line segment is then examined whether it lies within or partially within the maximum ring from the site.

The unique Block Group ID numbers of each line segment that lie within the maximum ring are retained. All Block Group boundary lines matching the Block Group numbers are then extracted from the respective county files to obtain all sides of the included Block Groups. Boundary records are then sorted in adjacent side order to determine the shape and area of each Block Group polygon.

method to solve for the area of a polygon is to take one-half the sum of the products obtained by multiplying each X-coordinate by the difference between the adjacent Y-coordinates. For a polygon with coordinates at adjacent angles A, B, C, D, and E. The formula can be expressed:

Area = 1/2{Xa(Ye-Yb)+ Xb(Ya-Yb)+ Xc(Yb-Yd)+ Xd(Yc-Ye)+ Xe(Yd-Ya)}

or each ring, the selected Block Groups will be inside, outside, or intersected by the ring. When a polygon is intersected, the partial Block Group area within that ring is calculated using the method described below.

When a ring intersects a Block Group, the intersect points are solved and plotted at the points where the ring enters and exits the shape. The chord line, a line within the circle connecting the intersect points is determined. This chord line is used to calculate the segment area, the half moon shape between the chord line and the ring, and the sub-polygon created by the chord line and the Block Group boundaries that lie outside the ring.

The segment area is subtracted from the sub-polygon area to determine the area of the sub-polygon outside the ring. The area outside the ring is then subtracted from the area of the entire polygon to arrive at the inside area. This inside area is then divided by the tract's total area to determine the percentage of area within the ring. This process is repeated for each block group that is intersected by one of the rings. The total area, partial area, and percentage of partial area of those block groups within, or partially within a ring, are held in memory for the report.

On occasion, the algorithm described above is unable to determine the area of the partial area. Within the report program is a "Paint" routine which allows an enclosed shape to be highlighted. Another routine calculates the percentage of highlighted screen pixels to the pixels within the polygon. A manual entry is allowed. Both the "paint" method and manual entry method over ride the calculated method.

CENTRACTS lists, starting on page 4, all Block Groups in State, County, Census Tract, and Block Group ID order that lie within, or partially within, the maximum ring. Each Block Group is identified by a City or Town name and by the Block Group's State, ounty, Tract and Block Group ID number. Following is the Block Group's 1990 populu cion and house count extracted from the Census Bureau's 1990 STF-1A files.

The next four columns display water source data from the 1990 STF-3A files. The [redacted] is "[redacted]y source of water", followed by "Units with individual well, Drilled, source of water"; "Units with individual well, Dug, source of water" and "Units with Other source of water".

For each ring, CENTRACTS then shows the Block Groups that are within that ring, the Block Group's total area in square miles, the partial area of the Block Group within that ring, and the partial percentage within the ring. The areas of the included Block Group and the partial areas are then totaled.

The last section tallies the demographic data within each ring. The percentage of area for each Block Group is multiplied times the census data for that Block Group and totaled for all Block Group's within the ring. Ring totals are then determined by subtracting the three mile data from the four mile, the two mile from the three mile, one from the two, etc... Population on private wells is calculated using the formula: ((Drilled + Dug Wells) / Households) * Population

Palm Harbor Homes
976 Airport Rd, Winder, GA

No.	City	Block Group ID	Blk Grp People	House Holds	Public Water	Drilled Wells	Dug Wells	Other
1	Winder	13013 1802 1	2087	789	764	31	9	2
2	Winder	13013 1802 2	926	452	401	39	0	0
3	Winder	13013 1802 3	1478	659	670	0	0	0
4	Winder	13013 1802 4	1773	735	724	0	0	0
5	Winder	13013 1802 5	1752	819	784	38	8	0
6	Winder	13013 1803 1	2832	1044	698	234	82	39
7	Winder	13013 1803 2	2077	831	558	178	70	0
8	Statham	13013 1804 1	2213	843	186	408	247	20
9	Statham	13013 1804 2	1446	523	299	138	57	11
10	Statham	13013 1804 3	413	169	169	0	0	0
11	Bethlehem	13013 1805 2	2110	795	361	308	158	0
12	Bethlehem	13013 1805 3	143	60	55	6	0	0
13	Bethlehem	13013 1805 4	836	300	24	160	88	0
	Totals:		20086	8019	5693	1540	719	72

Palm Harbor Homes
976 Airport Rd, Winder, GA

City	Census Tract ID		Tract People	House Count	Public Water	Drilled Wells	Dug Wells	Other Sources
Bethlehem	13013 1805	4	836	300	24	160	88	0
Bethlehem	13013 1805	2	2110	795	361	308	158	0
Bethlehem	13013 1805	3	143	60	55	6	0	0
	Sub Totals:		3089	1155	440	474	246	0
Statham	13013 1804	3	413	169	169	0	0	0
Statham	13013 1804	1	2213	843	186	408	247	20
Statham	13013 1804	2	1446	523	299	138	57	11
	Sub Totals:		4072	1535	654	546	304	31
Winder	13013 1802	1	2087	789	764	31	9	2
Winder	13013 1802	2	926	452	401	39	0	0
Winder	13013 1802	3	1478	659	670	0	0	0
Winder	13013 1802	4	1773	735	724	0	0	0
Winder	13013 1802	5	1752	819	784	38	8	0
Winder	13013 1803	1	2832	1044	698	234	82	39
Winder	13013 1803	2	2077	831	558	178	70	0
	Sub Totals:		12925	5329	4599	520	169	41

Palm Harbor Homes
976 Airport Rd, Winder, GA

For Radius of 4 Mi., Circle Area = 50.265482

No.	City	Block Group ID	Total Area	Partial Area	% Within Radius
1	Winder	13013 18021	4.464906	4.464906	100.00
2	Winder	13013 18022	5.602889	1.850726	33.03
3	Winder	13013 18023	1.468341	0.267200	18.20
4	Winder	13013 18024	0.844281	0.677893	80.29
5	Winder	13013 18025	2.666004	1.186513	44.51
6	Winder	13013 18031	16.770720	2.310088	13.77
7	Bethlehem	13013 18054	9.407944	7.719365	82.05
8	Statham	13013 18041	26.397856	9.388784	35.57
9	Statham	13013 18042	9.711700	6.930822	71.37
10	Statham	13013 18043	0.645253	0.603292	93.50
11	Bethlehem	13013 18052	16.396683	1.955618	11.93
12	Bethlehem	13013 18053	0.587019	0.454788	77.47
13	Winder	13013 18032	13.549917	12.455485	91.92
	Totals:		108.513519	50.265484	

For Radius of 3 Mi., Circle Area = 28.274334

No.	City	Block Group ID	Total Area	Partial Area	% Within Radius
1	Winder	13013 18021	4.464906	4.173819	93.48
2	Winder	13013 18022	5.602889	0.078841	1.41
4	Winder	13013 18024	0.844281	0.150884	17.87
7	Bethlehem	13013 18054	9.407944	4.320020	45.92
8	Statham	13013 18041	26.397856	4.416128	16.73
9	Statham	13013 18042	9.711700	4.447525	45.80
13	Winder	13013 18032	13.549917	10.687117	78.87
	Totals:		69.979492	28.274334	

For Radius of 2 Mi., Circle Area = 12.566371

No.	City	Block Group ID	Total Area	Partial Area	% Within Radius
1	Winder	13013 18021	4.464906	1.319448	29.55
7	Bethlehem	13013 18054	9.407944	1.160828	12.34
8	Statham	13013 18041	26.397856	1.189122	4.50
9	Statham	13013 18042	9.711700	1.804950	18.59
13	Winder	13013 18032	13.549917	7.092023	52.34
	Totals:		63.532326	12.566370	

For Radius of 1 Mi., Circle Area = 3.141593

		Block	Total	Partial	% Within

Palm Harbor Homes
976 Airport Rd, Winder, GA

No.	City	Group ID	Area	Area	Radius
1	Winder	13013 18021	4.464906	0.044531	1.00
9	Statham	13013 18042	9.711700	0.000350	0.00
13	Winder	13013 18032	13.549917	3.096712	22.85
	Totals:		27.726524	3.141593	

For Radius of .5 Mi., Circle Area = 0.785398

No.	City	Block Group ID	Total Area	Partial Area	% Within Radius
13	Winder	13013 18032	13.549917	0.785398	5.80
	Totals:		13.549917	0.785398	

For Radius of .25 Mi., Circle Area = 0.196350

No.	City	Block Group ID	Total Area	Partial Area	% Within Radius
13	Winder	13013 18032	13.549917	0.196350	1.45
	Totals:		13.549917	0.196350	

Palm Harbor Homes
976 Airport Rd, Winder, GA

10418.05 p / 4139.09 h = 2.52 pop/household

========== Site Data ==========

Population:	10418.05
Households:	4139.09
Drilled Wells:	672.91
Dug Wells:	307.78
Other Water Sources:	22.34

========== Partial (RING) data ==========

---- Within Ring: 4 Mile(s) and 3 Mile(s) ----

Population:	5082.75
Households:	2090.09
Drilled Wells:	298.07
Dug Wells:	136.32
Other Water Sources:	12.08

** Population On Private Wells: 1056.36

---- Within Ring: 3 Mile(s) and 2 Mile(s) ----

Population:	3159.88
Households:	1208.70
Drilled Wells:	208.75
Dug Wells:	99.58
Other Water Sources:	6.72

** Population On Private Wells: 806.06

---- Within Ring: 2 Mile(s) and 1 Mile(s) ----

Population:	1679.88
Households:	642.49
Drilled Wells:	125.10
Dug Wells:	55.79
Other Water Sources:	3.52

** Population On Private Wells: 472.95

---- Within Ring: 1 Mile(s) and .5 Mile(s) ----

Population:	375.16
Households:	149.64
Drilled Wells:	30.68
Dug Wells:	12.03
Other Water Sources:	0.02

** Population On Private Wells: 107.08

Palm Harbor Homes
976 Airport Rd, Winder, GA

---- Within Ring: .5 Mile(s) and .25 Mile(s) ----

Population:	90.29
Households:	36.13
Drilled Wells:	7.74
Dug Wells:	3.04
Other Water Sources:	0.00

** Population On Private Wells: 26.95

---- Within Ring: .25 Mile(s) and 0 Mile(s) ----

Population:	30.10
Households:	12.04
Drilled Wells:	2.58
Dug Wells:	1.01
Other Water Sources:	0.00

** Population On Private Wells: 8.98

** Total Population On Private Wells: 2478.38

OVERSIZED

DOCUMENT

APPENDIX 5

Georgia Department of Natural Resources
Wildlife Resources Division

LONICE C. BARRETT, COMMISSIONER
DAVID WALLER, DIVISION DIRECTOR

Georgia Natural Heritage Program
2117 U.S. Hwy. 278 S.E., Social Circle, Georgia 30279-4714
(770) 918-6411, (706) 557-3032

RECEIVED
JUN 21 1996
Z. SITES RESPONSE PROG

June 17, 1996

John Hetrick
Georgia Department of Natural Resources
Environmental Protection Division
205 Butler Street, SE
Suite 1462
Atlanta, Georgia 30334

Subject: Known or Potential Occurrences of Protected Plant and Animal Species for Barrow County, Palm Harbor Holmes Site

Dear Mr. Hetrick;

This is response to your request of June 10, 1996. According to our records, there are no known occurrences of rare species on or within three miles of the project site. Enclosed are lists that should aid in determining potentials for the area of concern.

If I can be of further assistance, please let me know.

Sincerely,

Greg Krakow

Greg Krakow
Data Manager

GK/sh

enclosures
cc: John Bozeman

Georgia Department of Natural Resources
Wildlife Resources Division

LONICE C. BARRETT, COMMISSIONER
DAVID WALLER, DIVISION DIRECTOR

Georgia Natural Heritage Program
2117 U.S. Hwy. 278 S.E., Social Circle, Georgia 30279-4714
(770) 918-6411, (706) 557-3032

Dear Database User:

Please keep in mind the limitations of our database. The site in question may contain rare species or important natural areas of which we are unaware.

The data collected by the Georgia Natural Heritage Program comes from a variety of sources, including museum and herbarium records, literature, and reports from individuals and organizations, as well as field surveys by our staff biologists. In most cases the information is not the result of an on-site survey by our staff. Many areas in Georgia have never been surveyed thoroughly. Therefore, the Georgia Natural Heritage Program can only occasionally provide definitive information on the presence or absence of rare species on a given site.

Our files are updated constantly as new information is received. Thus, information provided by our program represents the existing data in our files at the time of the request and should not be considered a final statement on the species or area under consideration.

Sincerely,

Georgia Natural Heritage Program

Edition of 5 April 1996

EXPLANATION OF RARITY RANKS AND LEGAL STATUSES

The "Global Rank" and "State Rank" columns indicate relative rarity of species at the rangewide or global level and the Georgia or state level, respectively. An explanation of these ranks and of federal and state protection status follows.

STATE [GLOBAL] RANK:

S1[G1] = Critically imperiled in state [globally] because of extreme rarity (5 or fewer occurrences).

S2[G2] = Imperiled in state [globally] because of rarity (6 to 20 occurrences).

S3[G3] = Rare or uncommon in state [rare and local throughout range or in a special habitat] (on the order of 21 to 100 occurrences).

S4[G4] = Apparently secure in state [globally].

S5[G5] = Demonstrably secure in state [globally].

SA = Accidental in state, including species (usually birds or butterflies) recorded once or twice or only at very great intervals.

SN = Regularly occurring, usually migratory and typically nonbreeding species.

SR = Reported from the state, but without persuasive documentation.

SU[GU] = Possibly in peril in state [range-wide] but status uncertain; need more information on threats.

SX[GX] = Apparently extirpated from state [extinct throughout range]. GXC is known only in cultivation/captivity.

SE = An exotic established in state; may be native elsewhere in North America; sometimes nativity is difficult to determine (SE?).

SH[GH] = Of historical occurrence in the state [throughout its range], perhaps not verified in the past 20 years, but suspected to be still extant.

FEDERAL STATUS:

LE = Listed endangered. The most critically threatened species. A species that may become extinct or disappear from a significant part of its range if not immediately protected.

LT = Listed threatened. The next most critical level of threatened species. A species that may become endangered if not protected.

PE or PT = Candidate species currently proposed for listing as endangered or threatened.

C = Candidate species presently under status review for federal listing for which adequate information exists on biological vulnerability and threats to list the taxa as endangered or threatened.

STATE STATUS:

The following abbreviations are used to indicate the status of state-protected plants and animals or those proposed for state-protection in Georgia.

E = Listed as endangered.

T = Listed as threatened.

R = Listed as rare

U = Listed as unusual (and thus deserving of special consideration).

PE = Proposed endangered.

PT = Proposed threatened.

PU = Proposed unusual.

NOTE: This is a working list and is constantly revised. For the latest changes, acknowledgement of numerous sources, interpretation of data, or other information connected with this list, please contact:

Greg Krakow, Data Manager
Georgia Department of Natural Resources
Wildlife Resources Division
Georgia Natural Heritage Program
2117 U.S. Highway 278 S.E.
Social Circle, Georgia 30279-4714
770-918-6411 or 706-557-3032
Internet e-mail: natural_heritage@mail.dnr.state.ga.us

The proper citation for this list is:

Georgia Natural Heritage Program. [Edition date from top right corner]. [Title from top center]. Georgia Department of Natural Resources, Social Circle.

13 May 1994

Special Animals Potentially Occurring in Barrow County

Georgia Department of Natural Resources, Wildlife Resources Division, Georgia Natural Heritage Program

Species Common Name	Global Rank	State Rank	Federal Status	State Status	Habitat
Aimophila aestivalis BACHMAN'S SPARROW	G3	S3	C2	R	Open pine or oak woods; old fields; brushy areas
Ammodramus henslowii HENSLOW'S SPARROW	G4	S3	C2		Fields; meadows
Coccyzus erythropthalmus BLACK-BILLED CUCKOO	G5	S3?			Forest edges; open woods; old fields
Cyprinella callisema OCMULGEE SHINER	G3	S3			Blackwater & brownwater streams
Cyprinella callitaenia BLUESTRIPE SHINER	G2	S1	C2	T	Brownwater rivers
Cyprinella xaenura ALTAMAHA SHINER	G3?	S3	C2	E	Brownwater streams
Hemidactylium scutatum FOUR-TOED SALAMANDER	G5	S2			[redacted]
Hybognathus regius EASTERN SILVERY MINNOW	G5	S2?			Blackwater and brownwater streams
Lanius ludovicianus migrans MIGRANT LOGGERHEAD SHRIKE	G4T2	S?	C2		Open woods; field edges
Myotis austroriparius SOUTHEASTERN BAT	G4	S3S4	C2		Caves and buildings near water
Ophisaurus attenuatus SLENDER GLASS LIZARD	G5	S3			Open woods; savannas; old fields; edges of streams & ponds; sandhills
Pseudotriton montanus MUD SALAMANDER	G5	S3			[redacted]
Thryomanes bewickii BEWICK'S WREN	G5	SU		R	Thickets; brushy areas; open woods

Special Plants Potentially Occurring in Barrow County

Georgia Department of Natural Resources, Wildlife Resources Division, Georgia Natural Heritage Program

Species Common Name	Global Rank	State Rank	Federal Status	State Status	Habitat
Amorpha schwerinii SCHWERIN INDIGO BUSH	G2G3	S2			Granite outcrops; rocky upland forests
Amphianthus pusillus POOL SPRITE, SNORKELWORT	G2	S2	LT	T	Granite outcrops
Aster georgianus GEORGIA ASTER	G2G3	S2	C2		Upland oak-hickory-pine forests
Calystegia catesbiana ssp sericata SILKY BINDWEED	G3T2T3	S2S3			Openings in montane oak-hickory-pine forests
Carex prasina DROOPING SEDGE	G4	S3?			Forested seepage slopes
Carex stricta SEDGE	G5	S1?			Marshes, wet meadows
Carex torta TWISTED SEDGE	G5	S1			Rocky streambeds
Carex venusta SEDGE	G4	S3?			[redacted]
Castanea dentata AMERICAN CHESTNUT (NUT-BEARING)	G4	S3			Upland mixed oak or oak-hickory forests
Clematis ochroleuca CURLY-HEADS	G4	S2			Dry woods over basic rock
Crataegus ravenelii RAVENEL HAWTHORN	G?	SU			Open hardwood forests
Cypripedium acaule PINK LADYSLIPPER	G5	S4		U	Upland oak-hickory-pine forests; piney woods
Cypripedium calceolus var parviflorum SMALL YELLOW LADYSLIPPER	G5Q	S1		U	Upland oak-hickory-pine forests; mixed hardwood forests
Dichanthelium boreale PANIC-GRASS	G5	SU			Moist grassy, upland forests
Hexastylis shuttleworthii var harperi HARPER HEARTLEAF	G4T2	S2		U	Swampy deciduous hardwood forests
Juglans cinerea BUTTERNUT (NUT-BEARING)	G5	S3?	C2		Floodplain forest
Lonicera flava YELLOW HONEYSUCKLE	G5?	S3?			Rocky, upland forests & thickets
Melanthium hybridum BROADLEAF BUNCHFLOWER	G5	S2?			Mesic deciduous hardwood forests
Nestronia umbellula INDIAN OLIVE	G3G4	S2	C2	T	Oak-hickory-pine woods with heath understory; granite outcrops
Panax quinquefolius AMERICAN GINSENG	G4	S3	3C		Mesic hardwood forests; cove hardwood forests
Quercus prinoides DWARF CHINKAPIN OAK	G5	S2			Upland oak-hickory-pine forests; usually over basic soils
Rhododendron flammeum OCONEE AZALEA	G3	S3			Bluff forests and mesic woods

13 May 1994

Special Plants Potentially Occurring in Barrow County

Georgia Department of Natural Resources, Wildlife Resources Division, Georgia Natural Heritage Program

Species Common Name	Global Rank	State Rank	Federal Status	State Status	Habitat
Sedum pusillum DWARF GRANITE STONECROP	G3	S3	C2	T	Granite outcrops
Smilax biltmoreana BILTMORE CARRION-FLOWER	G2G3	S3?			Deciduous forests
Stewartia ovata MOUNTAIN CAMELLIA	G4	S3?			Mesic hardwood forests; bluff forests
Thalictrum subrotundum ROUNDLEAF MEADOWRUE	G1G2	SR	C2		Swamp edges, streamsides; mesic ravine forests
Waldsteinia lobata PIEDMONT BARREN STRAWBERRY	G2?	S2	C2	T	Stream terraces & adjacent gneiss outcrops

OMB Approval Number: 2050-0095
Approved for Use Through: 1/92

PA Scoresheets

Site Name: Palm Harbor Homes
CERCLIS ID No.: GAR 000003046
Street Address: 976 Airport Rd.
City/State/Zip: Winder GA 30680

Investigator: John Hetrick
Agency/Organization: GA EPD
Street Address: 205 Butler St., Suite 1462
City/State/Zip: Atlanta GA 30334
Date: 7/3/96

INSTRUCTIONS FOR SCORESHEETS

Introduction

This scoresheets package functions as a self-contained workbook providing all of the basic tools to apply collected data and calculate a PA score. Note that a computerized scoring tool, "PA-Score," is also available from EPA (Office of Solid Waste and Emergency Response, Directive 9345.1-11). The scoresheets provide space to:

- Record information collected during the PA
- Indicate references to support information
- Select and assign values ("scores") for factors
- Calculate pathway scores
- Calculate the site score

Do not enter values or scores in shaded areas of the scoresheets. You are encouraged to write notes on the scoresheets and especially on the Criteria Lists. On scoresheets with a reference column, indicate a number corresponding to attached sources of information or pages containing rationale for hypotheses; attach to the scoresheets a numbered list of these references. Evaluate all four pathways. Complete all Criteria Lists, scoresheets, and tables. Show calculations, as appropriate. If scoresheets are photocopy reproduced, copy and submit the numbered pages (right-side pages) only.

GENERAL INFORMATION

Site Description and Operational History: Briefly describe the site and its operating history. Provide the site name, owner/operator, type of facility and operations, size of property, active or inactive status, and years of waste generation. Summarize waste treatment, storage, or disposal activities that have or may have occurred at the site; note also if these activities are documented or alleged. Identify probable source types and prior spills. Summarize highlights of previous investigations.

Probable Substances of Concern: List hazardous substances that have or may have been stored, handled, or disposed at the site, based on your knowledge of site operations. Identify the sources to which the substances may be related. Summarize any existing analytical data concerning hazardous substances detected onsite, in releases from the site, or at targets.

GENERAL INFORMATION (continued)

Site Sketch: Prepare a sketch of the site (freehand is acceptable). Indicate all pertinent features of the site and nearby environs, including: waste sources, buildings, residences, access roads, parking areas, drainage patterns, water bodies, vegetation, wells, sensitive environments, etc.

GENERAL INFORMATION

Site Description and Operational History:

SITE DESCRIPTION

The site consists of one large building and its grounds enclosed by a cyclone fence. The building is currently being used as a warehouse for fiber insulation. The interior of the building shows no evidence of spills. A railroad spur line enters the property from the southeast side and extends up to to the northeast side of the building. Within the fenced area at the southeast end of the site a spill of hardened black roofing tar(?) was noted. On the southeastern end of the warehouse there is an nonworking cyclone. Near the cyclone, there are three empty drums and a residue from a spill. The residue is a resin-like material.. Adjacent to the spill area were the remains of one almost completely rusted drum. There were no identifying markings on any of the drums. On the north side of the warehouse, an overturned drum was found. Beside the drum there was a dark-brown tough residue on the ground surface. On the north side of the site, near the northwest corner of the warehouse there are seven monitoring wells, a fire hydrant, the site of a removed UST estimated at 1500 gal. capacity, and an above-ground tank estimated to have a 300 gallon capacity. Near the gate on the northwest side of the warehouse is located a fire hydrant, and one monitoring well inside the fence and one monitoring well outside the fence. Also near this gate but just outside the property line is one monitoring well and the site where a UST had been removed. The site is on city of Winder public water

OPERATIONAL HISTORY

The site was used as a production facility for the manufacture of mobile homes from the late 1960's to 1989. Palm Harbor Homes occupied the site from 1980 to 1989. Prior to 1980 the site was occupied by Wicks Mobile Homes. The facility is presently used by Athana to warehouse fiber insulation.

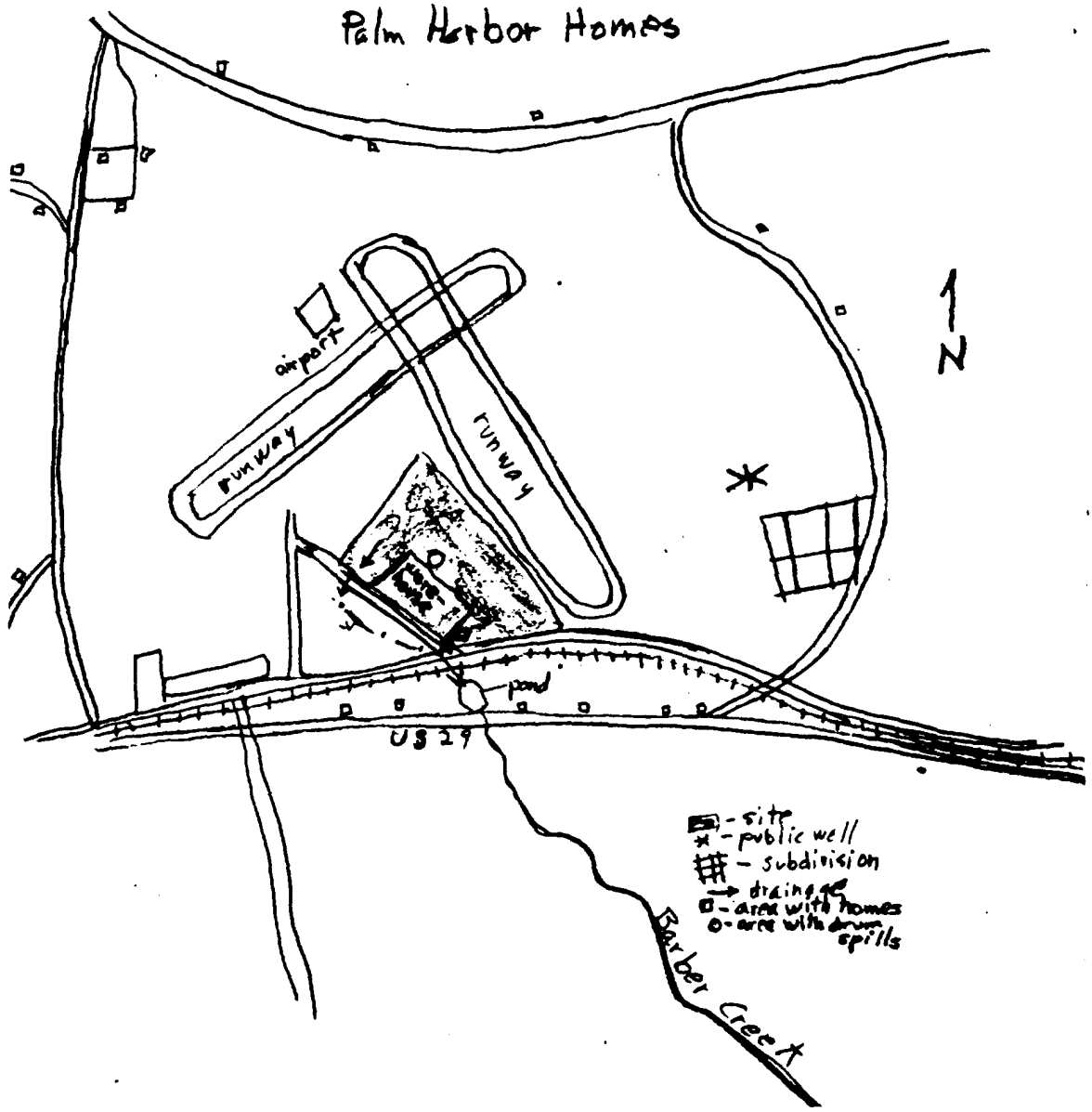
Probable Substances of Concern:
(Previous investigations, analytical data)

PROBABLE SUBSTANCES OF CONCERN

According to a hazardous waste manifest (state manifest document No. 92620) some of the regulated chemicals within some of the drums removed from the site were mineral spirits, alcohol, varnish, and waste paint related material. The Phase 1 Environmental Assessment (1994) reported that an AST on the site contained a liquid which had a petroleum odor and that one drum present at the site was labeled as containing methyl cellulose and another drum was labeled anti-icing biocidal solution. From the analysis of soil and groundwater samples, the 1994 Phase II Limited Site Investigation found that a reportable release of petroleum products (not reportable under CERLA) has occurred at the site.

GENERAL INFORMATION (continued)

Site Sketch:
(Show all pertinent features, indicate sources and closest targets, indicate north)



SOURCE EVALUATION

- Number and name each source (e.g., 1. East Drum Storage Area, 2. Sludge Lagoon, 3. Battery Pile).
- Identify source type according to the list below.
- Describe the physical character of each source (e.g., dimensions, contents, waste types, containment, operating history).
- Show waste quantity (WQ) calculations for each source for appropriate tiers. Refer to instructions opposite page 5 and PA Tables 1a and 1b. Identify waste quantity tier and waste characteristics (WC) factor category score (for a site with a single source, according to PA Table 1a). Determine WC from PA Table 1b for the sum of source WQs for a multiple-source site.
- Attach additional sheets if necessary.
- Determine the site WC factor category score and record at the bottom of the page.

Source Type Descriptions

Landfill: an engineered (by excavation or construction) or natural hole in the ground into which wastes have been disposed by backfilling, or by contemporaneous soil deposition with waste disposal, covering wastes from view.

Surface Impoundment: a topographic depression, excavation, or diked area, primarily formed from earthen materials (lined or unlined) and designed to hold accumulated liquid wastes, wastes containing free liquids, or sludges that were not backfilled or otherwise covered during periods of deposition; depression may be dry if deposited liquid has evaporated, volatilized or leached, or wet with exposed liquid; structures that may be more specifically described as lagoon pond, aeration pit, settling pond, tailings pond, sludge pit, etc.; also a surface impoundment that has been covered with soil after the final deposition of waste materials (i.e., buried or backfilled).

Drums: portable containers designed to hold a standard 55-gallon volume of wastes.

Tanks and Non-Drum Containers: any stationary device, designed to contain accumulated wastes, constructed primarily of fabricated materials (such as wood, concrete, steel, or plastic) that provide structural support; any portable or mobile device in which waste is stored or otherwise handled.

Contaminated Soil: soil onto which available evidence indicates that a hazardous substance was spilled, spread, disposed, or deposited.

Pile: any non-containerized accumulation above the ground surface of solid, non-flowing wastes; includes open dumps. Some types of piles are: Chemical Waste Pile -- consists primarily of discarded chemical products, by-products, radioactive wastes, or used or unused feedstocks; Scrap Metal or Junk Pile -- consists primarily of scrap metal or discarded durable goods such as appliances, automobiles, auto parts, or batteries, composed of materials suspected to contain or have contained a hazardous substance; Tailings Pile -- consists primarily of any combination of overburden from a mining operation and tailings from a mineral mining, beneficiation, or processing operation; Trash Pile -- consists primarily of paper, garbage, or discarded non-durable goods which are suspected to contain or have contained a hazardous substance.

Land Treatment: landfarming or other land treatment method of waste management in which liquid wastes or sludges are spread over land and tilled, or liquids are injected at shallow depths into soils.

Other: a source that does not fit any of the descriptions above; examples include contaminated building, ground water plume with no identifiable source, storm drain, dry well, and injection well.

SOURCE EVALUATION

Source No.:	Source Name:	Source Waste Quantity (WQ) Calculations:
Source Description: 15 drums were reported to have been present outside of the buildings. Many of the drums appeared to be full or partially full of liquid. Some of the drums were rusted through and empty. (Daynes and Moore Phase I Assessment of Old Palm Harbor Facility and adjacent undeveloped land, Winder GA, pgs 5-1, 5-2)		15 drums/10 = 1.5 = WQ for multiple sources

Source No.:	Source Name:	Source Waste Quantity (WQ) Calculations:
Source Description: An estimated 6'x 6' area of stained soil was observed during the PA inspection and assumed to be contaminated.		6ft x 6ft = $36ft^2$ 36 / 3400 = 0.011 = WQ for mutiple sources

Source No.:	Source Name:	Source Waste Quantity (WQ) Calculations:
Source Description:		

Site WC: 18

WASTE CHARACTERISTICS (WC) SCORES

WC, based on waste quantity, may be determined by one or all of four measures called "tiers": constituent quantity, wastestream quantity, source volume, and source area. PA Table 1a (page 5) is divided into these four tiers. The amount and detail of information available determine which tier(s) to use for each source. For each source, evaluate waste quantity by as many of the tiers as you have information to support, and select the result that gives you the highest WC score. If minimal, incomplete, or no information is available regarding waste quantity, assign a WC score of 18 (minimum).

PA Table 1a has 6 columns: column 1 indicates the quantity tier; column 2 lists source types for the four tiers; columns 3, 4, and 5 provide ranges of waste amount for sites with only one source, which correspond to WC scores at the top of the columns (18, 32, or 100); column 6 provides formulas to obtain source waste quantity (WQ) values at sites with multiple sources.

To determine WC for sites with only one source:

1. *Identify source type (see descriptions opposite page 4).*
2. *Examine all waste quantity data available.*
3. *Estimate the mass and/or dimensions of the source.*
4. *Determine which quantity tiers to use based on available source information.*
5. *Convert source measurements to appropriate units for each tier you can evaluate for the source.*
6. *Identify the range into which the total quantity falls for each tier evaluated (PA Table 1a).*
7. *Determine the highest WC score obtained for any tier (18, 32, or 100, at top of PA Table 1a columns 3, 4, and 5, respectively).*
8. *Use this WC score for all pathways.* *

To determine WC for sites with multiple sources:

1. *Identify each source type (see descriptions opposite page 4).*
2. *Examine all waste quantity data available for each source.*
3. *Estimate the mass and/or dimensions of each source.*
4. *Determine which quantity tiers to use for each source based on the available information.*
5. *Convert source measurements to appropriate units for each tier you can evaluate for each source.*
6. *For each source, use the formulas in column 6 of PA Table 1a to determine the WQ value for each tier that can be evaluated. The highest WQ value obtained for any tier is the WQ value for the source.*
7. *Sum the WQ values for all sources to get the site WQ total.*
8. *Use the site WQ total from step 7 to assign the WC score from PA Table 1b.*
9. *Use this WC score for all pathways.* *

---

* The WC score is considered in all four pathways. However, if a primary target is identified for the ground water, surface water, or air migration pathway, assign the determined WC or a score of 32, whichever is greater, as the WC score for that pathway.

PA TABLE 1: WASTE CHARACTERISTICS (WC) SCORES

PA Table 1a: WC Scores for Single Source Sites and Formulas for Multiple Source Sites

TIER	SOURCE TYPE	SINGLE SOURCE SITES (assigned WC scores)			MULTIPLE SOURCE SITES
		WC = 18	*WC = 32*	*WC = 100*	Formula for Assigning Source WQ Values
CONSTITUENT	N/A	≤100 lb	>100 to 10,000 lb	>10,000 lb	*lb ÷ 1*
WASTESTREAM	N/A	≤500,000 lb	>500,000 to 50 million lb	>50 million lb	*lb ÷ 5,000*
VOLUME	Landfill	≤6.75 million ft^3 ≤250,000 yd^3	>6.75 million to 675 million ft^3 >250,000 to 25 million yd^3	>675 million ft^3 >25 million yd^3	*ft^3 ÷ 67,500* *yd^3 ÷ 2,500*
	Surface impoundment	≤6,750 ft^3 ≤250 yd^3	>6,750 to 675,000 ft^3 >250 to 25,000 yd^3	>675,000 ft^3 >25,000 yd^3	*ft^3 ÷ 67.5* *yd^3 ÷ 2.5*
	Drums	≤1,000 drums	>1,000 to 100,000 drums	>100,000 drums	*drums ÷ 10*
	Tanks and non-drum containers	≤50,000 gallons	>50,000 to 5 million gallons	>5 million gallons	*gallons ÷ 500*
	Contaminated soil	≤6.75 million ft^3 ≤250,000 yd^3	>6.75 million to 675 million ft^3 >250,000 to 25 million yd^3	>675 million ft^3 >25 million yd^3	*ft^3 ÷ 67,500* *yd^3 ÷ 2,500*
	Pile	≤6,750 ft^3 ≤250 yd^3	>6,750 to 675,000 ft^3 >250 to 25,000 yd^3	>675,000 ft^3 >25,000 yd^3	*ft^3 ÷ 67.5* *yd^3 ÷ 2.5*
	Other	≤6,750 ft^3 ≤250 yd^3	>6,750 to 675,000 ft^3 >250 to 25,000 yd^3	>675,000 ft^3 >25,000 yd^3	*ft^3 ÷ 67.5* *yd^3 ÷ 2.5*
AREA	Landfill	≤340,000 ft^2 ≤7.8 acres	>340,000 to 34 million ft^2 >7.8 to 780 acres	>34 million ft^2 >780 acres	*ft^2 ÷ 3,400* *acres ÷ 0.078*
	Surface impoundment	≤1,300 ft^2 ≤0.029 acres	>1,300 to 130,000 ft^2 >0.029 to 2.9 acres	>130,000 ft^2 >2.9 acres	*ft^2 ÷ 13* *acres ÷ 0.00029*
	Contaminated soil	≤3.4 million ft^2 ≤78 acres	>3.4 million to 340 million ft^2 >78 to 7,800 acres	>340 million ft^2 >7,800 acres	*ft^2 ÷ 34,000* *acres ÷ 0.78*
	Pile*	≤1,300 ft^2 ≤0.029 acres	>1,300 to 130,000 ft^2 >0.029 to 2.9 acres	>130,000 ft^2 >2.9 acres	*ft^2 ÷ 13* *acres ÷ 0.00029*
	Land treatment	≤27,000 ft^2 ≤0.62 acres	>27,000 to 2.7 million ft^2 >0.62 to 62 acres	>2.7 million ft^2 >62 acres	*ft^2 ÷ 270* *acres ÷ 0.0062*

1 ton = 2,000 lb = 1 yd^3 = 4 drums = 200 gallons

* Use area of land surface under pile, not surface area of pile.

1 gal = 10 lb

PA Table 1b: WC Scores for Multiple Source Sites

WQ Total	*WC Score*
>0 to 100	18
>100 to 10,000	32
>10,000	100

GROUND WATER PATHWAY

Ground Water Use Description: Provide information on ground water use in the vicinity. Present the general stratigraphy, aquifers used, and distribution of private and municipal wells.

Calculations for Drinking Water Populations Served by Ground Water: Provide populations from private wells and municipal supply systems in each distance category. Show apportionment calculations for blended supply systems.

GROUND WATER PATHWAY
GROUND WATER USE DESCRIPTION

Describe Ground Water Use Within 4-miles of the Site:
(Describe stratigraphy, information on aquifers, municipal and/or private wells)

The bedrock of the area is granite gneiss (Reference 3) and according to the Phase I Environmental Assessment the soils of the area are well-drained. The uppermost aquifer at the site is the water table aquifer and the depth to groundwater is approximately 10 feet. The deeper aquifer used for public water supplies is located within saprolite and fractured bedrock. There are 1393 people that are served from waterwells located within a four mile radius. The bulk of these waterwell users are from two public well sources. One of the public sources is the town of Statham, which is listed on the CENTRACTS data report as being a single well. A call to Statham revealed that the supply is really from three sources one of which is a lake. To correct for this, the population served by Statham was reduced by 1/3. The second public well is owned by Athens Plumbing and Well and serves the nearby Bent Creek Subdivision. A call to a third public well listed by GIS found that the well, owned by Hope Christian Academy is no longer in use.

Calculations for Drinking Water Populations Served by Ground Water:

1. The population in the four mile radius is 11,010 and the number of housing units is 4464.2.
   (11,010 people)/(4,464 house units)= 2.47 people/water connection or 2.47 p/c
2. in 1/4 mile = 0 connections= score of 0
3. in 1/4-1/2 miles= 1 public well with 43 connections
   = (43 c)(2.47 p/c)= 106 people= score of 10
4. in 1/2-1.0 miles= 1 domestic well*= (1c)(2.47p/c)= 2 people= score of 1
5. in 1.0-2.0 miles= 2 domestic wells*= (2c)(2.47p/c)= 5 people= score of 1
6. in 2.0-3.0 miles= 3 domestic wells*= (3c)(2.47p/c)= 7 people= score of 1
7. in 3.0-4.0 miles= 1 public wells with 770 connections & 2 domestic wells*
   =(770c)(2.47p/c)= 1902 people on public wells
   and (2c)(2.47c/p)= 5 people on domestic wells
   for a total of 1907 people= score of 13
8. total score= 10+1+1+1+13= 26*

*- In order to furnish conservative calculations this includes wells with unknown uses.

GROUND WATER PATHWAY CRITERIA LIST

This "Criteria List" helps guide the process of developing hypotheses concerning the occurrence of a suspected release and the exposure of specific targets to a hazardous substance. The check-boxes record your professional judgment in evaluating these factors. Answers to all of the listed questions may not be available during the PA. Also, the list is not all-inclusive; if other criteria help shape your hypotheses, list them at the bottom of the page or attach an additional page.

The "Suspected Release" section identifies several site, source, and pathway conditions that could provide insight as to whether a release from the site is likely to have occurred. If a release is suspected, use the "Primary Targets" section to evaluate conditions that may help identify targets likely to be exposed to a hazardous substance. Record responses for the well that you feel has the highest probability of being exposed to a hazardous substance. You may use this section of the chart more than once, depending on the number of targets you feel may be considered "primary."

Check the boxes to indicate a "yes," "no," or "unknown" answer to each question. If you check the "Suspected Release" box as "yes," make sure you assign a Likelihood of Release value of 550 for the pathway.

GROUND WATER PATHWAY CRITERIA LIST

SUSPECTED RELEASE

Yes	No	Unk	
☒	☐	☐	Are sources poorly contained?
☒	☐	☐	Is the source a type likely to contribute to ground water contamination (e.g., wet lagoon)?
☐	☒	☐	Is waste quantity particularly large?
☒	☐	☐	Is precipitation heavy?
☐	☐	☒	Is the infiltration rate high?
☐	☒		Is the site located in an area of karst terrain?
☐	☐	☒	Is the subsurface highly permeable or conductive?
☐	☐	☒	Is drinking water drawn from a shallow aquifer?
☒	☐	☐	Are suspected contaminants highly mobile in ground water?
☐	☒	☐	Does analytical or circumstantial evidence suggest ground water contamination?
☐	☒		Other criteria?_____
☒	☐		**SUSPECTED RELEASE?**

PRIMARY TARGETS

Yes	No	Unk	
☒	☐	☐	Is any drinking water well nearby?
☐	☐	☒	Has any nearby drinking water well been closed?
☐	☒	☐	Has any nearby drinking water user reported foul-tasting or foul-smelling water?
☐	☐	☒	Does any nearby well have a large drawdown or high production rate?
☐	☒	☐	Is any drinking water well located between the site and other wells that are suspected to be exposed to a hazardous substance?
☐	☒	☐	Does analytical or circumstantial evidence suggest contamination at a drinking water well?
☐	☒	☐	Does any drinking water well warrant sampling?
☐	☒		Other criteria?_____
☐	☒		**PRIMARY TARGET(S) IDENTIFIED?**

Summarize the rationale for Suspected Release (attach an additional page if necessary):

There were several hazardous wastes at the site in drums and at least some of the drums spilled or leaked. In order make a conservative evaluation it was assumed that some hazardous waste was released.

Summarize the rationale for Primary Targets (attach an additional page if necessary):

Based on land surface elevations the most likely direction of groundwater flow is to the southeast. In that direction there is no groundwater user within two miles. Considering the small quantity of released pollutant the probability of contamination of wells at a distance greater than two miles is small.

GROUND WATER PATHWAY SCORESHEET

Pathway Characteristics

Answer the questions at the top of the page. Refer to the Ground Water Pathway Criteria List (page 7) to hypothesize whether you suspect that a hazardous substance associated with the site has been released to ground water. Record depth to aquifer (in feet): the difference between the deepest occurrence of a hazardous substance and the depth of the top of the shallowest aquifer at (or as near as possible) to the site. Note whether the site is in karst terrain (characterized by abrupt ridges, sink holes, caverns, springs, disappearing streams). Record the distance (in feet) from any source to the nearest well used for drinking water.

Likelihood of Release (LR)

1. **Suspected Release:** Hypothesize based on professional judgment guided by the Ground Water Pathway Criteria List (page 7). If you suspect a release to ground water, use only Column A for this pathway and do not evaluate factor 2.

2. **No Suspected Release:** If you do not suspect a release, determine score based on depth to aquifer or whether the site is in an area of karst terrain. If you do not suspect a release to ground water, use only Column B to score this pathway.

Targets (T)

This factor category evaluates the threat to populations obtaining drinking water from ground water. To apportion populations served by blended drinking water supply systems, determine the percentage of population served by each well based on its production.

3. **Primary Target Population:** Evaluate populations served by all drinking water wells that you suspect have been exposed to a hazardous substance released from the site. Use professional judgment guided by the Ground Water Pathway Criteria List (page 7) to make this determination. In the space provided, enter the population served by any wells you suspect have been exposed to a hazardous substance from the site. If only the number of residences is known, use the average county residents per household (rounded up to the next integer) to determine population served. Multiply the population by 10 to determine the Primary Target Population score. Note that if you do not suspect a release, there can be no primary target population.

4. **Secondary Target Population:** Evaluate populations served by all drinking water wells within 4 miles that you do not suspect have been exposed to a hazardous substance. Use PA Table 2a or 2b (for wells drawing from non-karst and karst aquifers, respectfully) (page 9). If only the number of residences is known, use the average county residents per household (rounded to the nearest integer) to determine population served. Circle the assigned value for the population in each distance category and enter it in the column on the far-right side of the table. Sum the far-right column and enter the total as the Secondary Target Population factor score.

5. **Nearest Well** represents the threat posed to the drinking water well that is most likely to be exposed to a hazardous substance. If you have identified a primary target population, enter 50. Otherwise, assign the score from PA Table 2a or 2b for the closest distance category with a drinking water well population.

6. **Wellhead Protection Area (WHPA):** WHPAs are special areas designated by States for protection under Section 1428 of the Safe Drinking Water Act. Local/State and EPA Regional water officials can provide information regarding the location of WHPAs.

7. **Resources:** A score of 5 can generally be assigned as a default measure. Assign zero only if ground water within 4 miles has no resource use.

Sum the target scores in Column A (Suspected Release) or Column B (No Suspected Release).

Waste Characteristics (WC)

8. **Waste Characteristics:** Score is assigned from page 4. However, if you have identified any primary target for ground water, assign either the score calculated on page 4 or a score of 32, whichever is greater.

Ground Water Pathway Score: Multiply the scores for LR, T, and WC. Divide the product by 82,500. Round the result to the nearest integer. If the result is greater than 100, assign 100.

GROUND WATER PATHWAY SCORESHEET

Pathway Characteristics		
Do you suspect a release (see Ground Water Pathway Criteria List, page 7)?	Yes X	No ___
Is the site located in karst terrain?	Yes ___	No X
Depth to aquifer:	10 ft	
Distance to the nearest drinking water well:	2640 ft	

	A *Suspected Release*	B *No Suspected Release*	*References*
LIKELIHOOD OF RELEASE			
1. SUSPECTED RELEASE: If you suspect a release to ground water (see page 7), assign a score of 550. Use only column A for this pathway.	(550) 550		Appendix 1
2. NO SUSPECTED RELEASE: If you do not suspect a release to ground water, and the site is in karst terrain or the depth to aquifer is 70 feet or less, assign a score of 500; otherwise, assign a score of 340. Use only column B for this pathway.		(500 or 340)	
LR =	550		
TARGETS			
3. PRIMARY TARGET POPULATION: Determine the number of people served by drinking water wells that you suspect have been exposed to a hazardous substance from the site (see Ground Water Pathway Criteria List, page 7). ___ people x 10 =	0		
4. SECONDARY TARGET POPULATION: Determine the number of people served by drinking water wells that you do NOT suspect have been exposed to a hazardous substance from the site, and assign the total population score from PA Table 2. Are any wells part of a blended system? Yes ✓ No ___ If yes, attach a page to show apportionment calculations.	26		Table 2
5. NEAREST WELL: If you have identified a primary target population for ground water, assign a score of 50; otherwise, assign the Nearest Well score from PA Table 2. If no drinking water wells exist within 4 miles, assign a score of zero.	(50, 20, 10, 6, 3, 2, or 0) 18	(20, 10, 6, 3, 2, or 0)	Figure 2
6. WELLHEAD PROTECTION AREA (WHPA): If any source lies within or above a WHPA, or if you have identified any primary target well within a WHPA, assign a score of 20; assign 5 if neither condition holds but a WHPA is present within 4 miles; otherwise assign zero.	(20, 5, or 0) 0	(20, 5, or 0)	
7. RESOURCES	(5 or 0) 5	(5 or 0)	
T =	49		
WASTE CHARACTERISTICS			
8. A. If you have identified any primary target for ground water, assign the waste characteristics score calculated on page 4, or a score of 32, whichever is GREATER; do not evaluate part B of this factor.	(100 or 32) 18		
B. If you have NOT identified any primary target for ground water, assign the waste characteristics score calculated on page 4.	(100, 32, or 18) 18	(100, 32, or 18)	
WC =			

GROUND WATER PATHWAY SCORE: $\frac{LR \times T \times WC}{82{,}500}$ (subject to a maximum of 100) 5.88

PA TABLE 2: VALUES FOR SECONDARY GROUND WATER TARGET POPULATIONS

PA Table 2a: Non-Karst Aquifers

Distance from Site	Population	Nearest Well (choose highest)	Population Served by Wells Within Distance Category										Population Value
			1 to 10	11 to 30	31 to 100	101 to 300	301 to 1,000	1,001 to 3,000	3,001 to 10,000	10,001 to 30,000	30,001 to 100,000	Greater than 100,000	
0 to ¼ mile	0	20	1	2	5	16	52	163	521	1,633	5,214	16,325	0
> ¼ to ½ mile	106	18	1	1	3	10	32	101	323	1,012	3,233	10,121	10
> ½ to 1 mile	2	9	1	1	2	5	17	52	167	522	1,668	5,224	1
> 1 to 2 miles	5	5	1	1	1	3	9	29	94	294	939	2,938	1
> 2 to 3 miles	7	3	1	1	1	2	7	21	68	212	678	2,122	1
> 3 to 4 miles	1902	2	1	1	1	1	4	13	42	131	417	1,306	13
Nearest Well =		18										Score =	26

PA Table 2b: Karst Aquifers

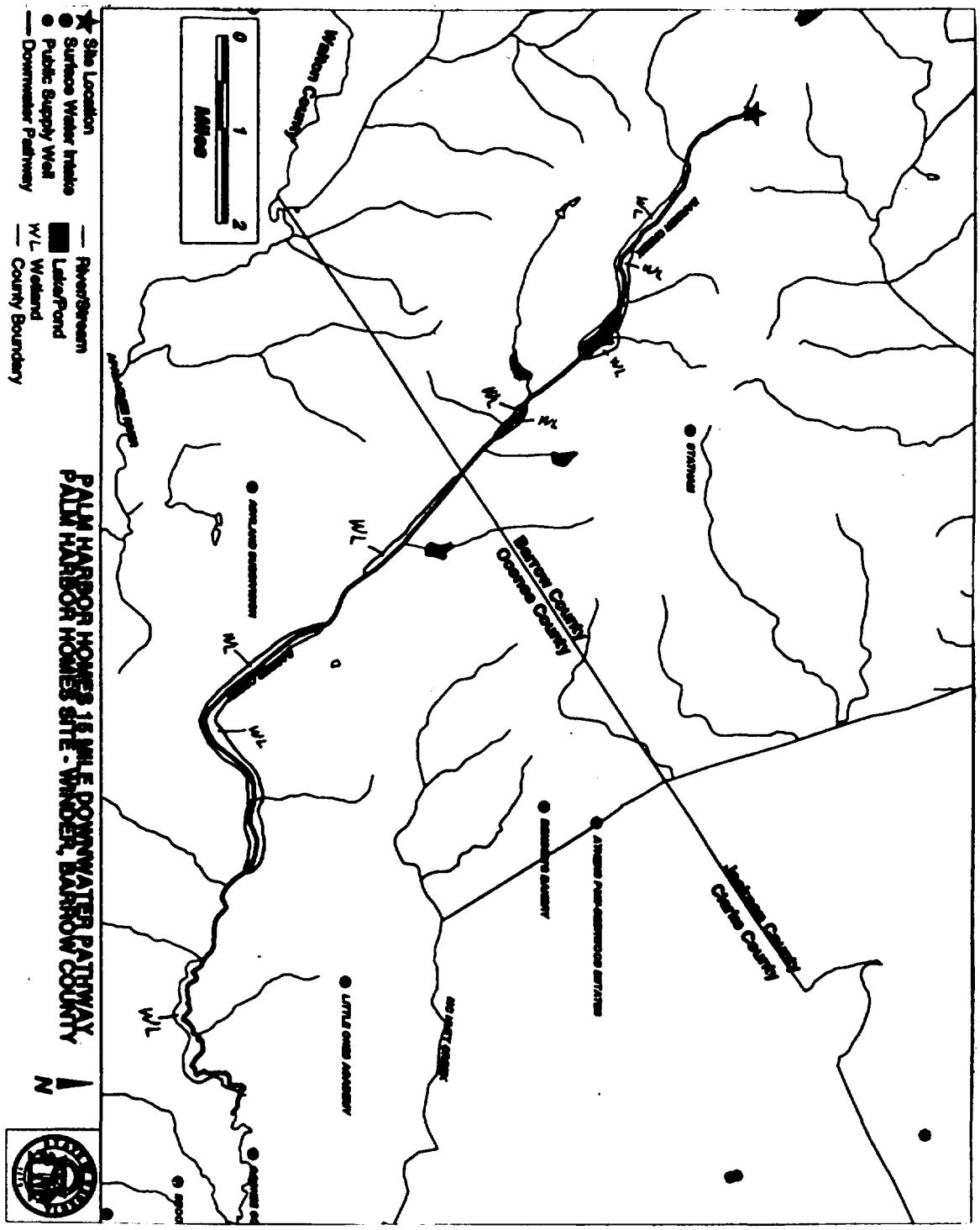
Distance from Site	Population	Nearest Well (use 20 for karst)	Population Served by Wells Within Distance Category										Population Value
			1 to 10	11 to 30	31 to 100	101 to 300	301 to 1,000	1,001 to 3,000	3,001 to 10,000	10,001 to 30,000	30,001 to 100,000	Greater than 100,000	
0 to ¼ mile	0	20	1	2	5	16	52	163	521	1,633	5,214	16,325	
> ¼ to ½ mile	0	20	1	1	3	10	32	101	323	1,012	3,233	10,121	
> ½ to 1 mile	0	20	1	1	3	8	26	82	261	816	2,607	8,162	
> 1 to 2 miles	0	20	1	1	3	8	26	82	261	816	2,607	8,162	
> 2 to 3 miles	0	20	1	1	3	8	26	82	261	816	2,607	8,162	
> 3 to 4 miles	0	20	1	1	3	8	26	82	261	816	2,607	8,162	
Nearest Well =												Score =	

SURFACE WATER PATHWAY

Migration Route Sketch: Sketch the surface water migration pathway (freehand is acceptable) illustrating the drainage route and identifying water bodies, probable point of entry, flows, and targets.

SURFACE WATER PATHWAY
MIGRATION ROUTE SKETCH

Suface Water Migration Route Sketch:
(include runoff route, probable point of entry, 15-mile target distance limit, intakes, fisheries, and sensitive environments)



SURFACE WATER PATHWAY CRITERIA LIST

This "Criteria List" helps guide the process of developing hypotheses concerning the occurrence of a suspected release and the exposure of specific targets to a hazardous substance. The check-boxes record your professional judgment in evaluating these factors. Answers to all of the listed questions may not be available during the PA. Also, the list is not all-inclusive; if other criteria help shape your hypotheses, list them at the bottom of the page or attach an additional page.

The "Suspected Release" section identifies several site, source, and pathway conditions that could provide insight as to whether a release from the site is likely to have occurred. If a release is suspected, use the "Primary Targets" section to guide you through evaluation of some conditions that may help identify targets likely to be exposed to a hazardous substance. Record responses for the target that you feel has the highest probability of being exposed to a hazardous substance. You may use this section of the chart more than once, depending on the number of targets you feel may be considered "primary."

Check the boxes to indicate a "yes," "no," or "unknown" answer to each question. If you check the "Suspected Release" box as "yes," make sure you assign a Likelihood of Release value of 550 for the pathway.

If the distance to surface water is greater than 2 miles, do not evaluate the surface water migration pathway. Document the source of information in the text boxes below the surface water criteria list.

SURFACE WATER PATHWAY CRITERIA LIST

SUSPECTED RELEASE

Yes	No	Unk	
☒	☐	☐	Is surface water nearby?
☐	☒	☐	Is waste quantity particularly large?
☐	☒	☐	Is the drainage area large?
☒	☐	☐	Is rainfall heavy?
☐	☒	☐	Is the infiltration rate low?
☒	☐	☐	Are sources poorly contained or prone to runoff or flooding?
☒	☐	☐	Is a runoff route well defined (e.g., ditch or channel leading to surface water)?
☐	☒	☐	Is vegetation stressed along the probable run-off route?
☐	☒	☐	Are sediments or water unnaturally discolored?
☐	☐	☒	Is wildlife unnaturally absent?
☐	☒	☐	Has deposition of waste into surface water been observed?
☒	☐	☐	Is ground water discharge to surface water likely?
☐	☒	☐	Does analytical or circumstantial evidence suggest surface water contamination?
☐	☒		Other criteria?_____
☒	☐		**SUSPECTED RELEASE?**

PRIMARY TARGETS

Yes	No	Unk	
☒	☐	☐	Is any target nearby? If yes:
			☐ Drinking water intake ☒ Fishery ☒ Sensitive environment
☐	☒	☐	Has any intake, fishery, or recreational area been closed?
☐	☒	☐	Does analytical or circumstantial evidence suggest surface water contamination at or downstream of a target?
☐	☒	☐	Does any target warrant sampling? If yes:
			☐ Drinking water intake ☐ Fishery ☐ Sensitive environment
☐	☒		Other criteria?_____
☐	☒		**PRIMARY INTAKE(S) IDENTIFIED?**
☒	☐		**PRIMARY FISHERY(IES) IDENTIFIED?**
☒	☐		**PRIMARY SENSITIVE ENVIRONMENT(S) IDENTIFIED?**

Summarize the rationale for Suspected Release (attach an additional page if necessary):

The headwaters of Barber Creek begin at the very edge of the site where drain-water from the site enters the creek. This proximity to surface water makes any spill a suspect for entry into surface water.

Summarize the rationale for Primary Targets (attach an additional page if necessary):

Barber Creek contains fish, has easy public access, and is thus assumed to be a fishery.

SURFACE WATER PATHWAY LIKELIHOOD OF RELEASE AND DRINKING WATER THREAT SCORESHEET

Pathway Characteristics

The surface water pathway includes three threats: Drinking Water Threat, Human Food Chain Threat, and Environmental Threat. Answer the questions at the top of the page. Refer to the Surface Water Pathway Criteria List (page 11) to hypothesize whether you suspect that a hazardous substance associated with the site has been released to surface water. Record the distance to surface water (the shortest overland drainage distance from a source to a surface water body). Record the flood frequency at the site (e.g., 100-yr, 200-yr). If the site is located in more than one floodplain, use the most frequent flooding event. Identify surface water use(s) along the surface water migration path and their distance(s) from the site.

Likelihood of Release (LR)

1. **Suspected Release:** Hypothesize based on professional judgment guided by the Surface Water Pathway Criteria List (page 11). If you suspect a release to surface water, use only Column A for this pathway and do not evaluate factor 2.

2. **No Suspected Release:** If you do not suspect a release, determine score based on the shortest overland drainage distance from a source to a surface water body. If distance to surface water is 2,500 feet or less, assign a score of 500. If distance to surface water is greater than 2,500 feet, determine score based on flood frequency. If you do not suspect a release to surface water, use only Column B to score this pathway.

Drinking Water Threat Targets (T)

3. List all drinking water intakes on downstream surface water bodies along the surface water migration path. Record the intake name, the type of water body on which the intake is located, the flow of the water body, and the number of people served by the intake (apportion the population if part of a blended system).

4. **Primary Target Population:** Evaluate populations served by all drinking water intakes that you suspect have been exposed to a hazardous substance released from the site. Use professional judgment guided by the Surface Water Pathway Criteria List (page 11) to make this determination. In the space provided, enter the population served by all intakes you suspect have been exposed to a hazardous substance from the site. If only the number of residences is known, use the average county residents per household (rounded up to the next integer) to determine population served. Multiply by 10 to determine the Primary Target Population score. Remember, if you do not suspect a release, there can be no primary target population.

5. **Secondary Target Population:** Evaluate populations served by all drinking water intakes within the target distance limit that you do not suspect have been exposed to a hazardous substance. Use PA Table 3 (page 13) and enter the population served by intakes for each flow category. If only the number of residences is known, use the average county residents per household (rounded to the nearest integer) to determine population served. Circle the assigned value for the population in each flow category and enter it in the column on the far-right side of the table. Sum the far-right column and enter the total as the Secondary Target Population factor score.

Gauging station data for many surface water bodies are available from USGS or other sources. In the absence of gauging station data, estimate flow using the list of surface water body types and associated flow categories in PA Table 4 (page 13). The flow for lakes is determined by the sum of flows of streams entering or leaving the lake. Note that the flow category "mixing zone of quiet flowing rivers" is limited to 3 miles from the probable point of entry.

6. **Nearest Intake** represents the threat posed to the drinking water intake that is most likely to be exposed to a hazardous substance. If you have identified a primary target population, enter 50. Otherwise, assign the score from PA Table 3 (page 13) for the lowest-flowing water body on which there is an intake.

7. **Resources:** A score of 5 can generally be assigned as a default measure. Assign zero only if surface water within the target distance limit has no resource use.

Sum the target scores in Column A (Suspected Release) or Column B (No Suspected Release).

SURFACE WATER PATHWAY
LIKELIHOOD OF RELEASE AND DRINKING WATER THREAT SCORESHEET

Pathway Characteristics	
Do you suspect a release (see Surface Water Pathway Criteria List, page 11)?	Yes ✓ No ___
Distance to surface water:	<100 ft
Flood frequency:	>100 yrs
What is the downstream distance to the nearest drinking water intake? >15 miles	
Nearest fishery? 1 miles Nearest sensitive environment? 0 miles	

LIKELIHOOD OF RELEASE

	A *Suspected Release*	B *No Suspected Release*	*References*
1. SUSPECTED RELEASE: If you suspect a release to surface water (see page 11), assign a score of 550. Use only column A for this pathway.	(550) 550		Appendix 1
2. NO SUSPECTED RELEASE: If you do not suspect a release to surface water, use the table below to assign a score based on distance to surface water and flood frequency. Use only column B for this pathway.		(500, 400, 300 or 100)	

Distance to surface water ≤ 2,500 feet	*500*
Distance to surface water > 2,500 feet, and	
Site in annual or 10-year floodplain	*500*
Site in 100-year floodplain	*400*
Site in 500-year floodplain	*300*
Site outside 500-year floodplain	*100*

	A	B
LR =	(550) 550	(500, 400, 300 or 100)

DRINKING WATER THREAT TARGETS

3. Record the water body type, flow (if applicable), and number of people served by each drinking water intake within the target distance limit. If there is no drinking water intake within the target distance limit, factors 4, 5, and 6 each receive zero scores.

Intake Name	*Water Body Type*	*Flow*	*People Served*
		cfs	
		cfs	
		cfs	

4. PRIMARY TARGET POPULATION: If you suspect any drinking water intake listed above has been exposed to a hazardous substance from the site (see Surface Water Pathway Criteria List, page 11), list the intake name(s) and calculate the factor score based on the total population served.

_____, _____,

0 people x 10 = 0

5. SECONDARY TARGET POPULATION: Determine the number of people served by drinking water intakes that you do NOT suspect have been exposed to a hazardous substance from the site, and assign the total population score from PA Table 3.

Are any intakes part of a blended system? Yes ___ No ___
If yes, attach a page to show apportionment calculations.

0

6. NEAREST INTAKE: If you have identified a primary target population for the drinking water threat (factor 4), assign a score of 50; otherwise, assign the Nearest Intake score from PA Table 3. If no drinking water intake exists within the target distance limit, assign a score of zero.

(50, 20, 10, 2, 1, or 0) 0 | (20, 10, 2, 1, or 0)

7. RESOURCES

(5 or 0) 5 | (5 or 0)

T = 5

PA TABLE 3: VALUES FOR SECONDARY SURFACE WATER TARGET POPULATIONS

Surface Water Body Flow (see PA Table 4)	Population	Nearest Intake (choose highest)	Population Served by Intakes Within Flow Category											Population Value
			1 to 30	31 to 100	101 to 300	301 to 1,000	1,001 to 3,000	3,001 to 10,000	10,001 to 30,000	30,001 to 100,000	100,001 to 300,000	300,001 to 1,000,000	Greater than 1,000,000	
<10 cfs	0	20	2	5	16	52	163	521	1,633	5,214	16,325	52,136	163,246	
10 to 100 cfs	0	2	1	1	2	5	16	52	163	521	1,633	5,214	16,325	
>100 to 1,000 cfs	0	1	0	0	1	1	2	5	16	52	163	521	1,633	
>1,000 to 10,000 cfs	0	0	0	0	0	0	1	1	2	5	16	52	163	
>10,000 cfs or Great Lakes	0	0	0	0	0	0	0	0	1	1	2	5	16	
3-mile Mixing Zone	0	10	1	3	8	26	82	261	816	2,607	8,162	26,068	81,663	

Nearest Intake = _____ Score = _____

PA TABLE 4: SURFACE WATER TYPE / FLOW CHARACTERISTICS WITH DILUTION WEIGHTS FOR SECONDARY SURFACE WATER SENSITIVE ENVIRONMENTS

Type of Surface Water Body			Dilution Weight
Water Body Type	OR	Flow	
minimal stream		< 10 cfs	1
small to moderate stream		10 to 100 cfs	0.1
moderate to large stream		> 100 to 1,000 cfs	N/A
large stream to river		> 1,000 to 10,000 cfs	N/A
large river		> 10,000 cfs	N/A
3-mile mixing zone of quiet flowing streams or rivers		10 cfs or greater	N/A
coastal tidal water (harbors, sounds, bays, etc.), ocean, or Great Lakes		N/A	N/A

SURFACE WATER PATHWAY HUMAN FOOD CHAIN THREAT SCORESHEET

Likelihood of Release (LR)

LR is the same for all surface water pathway threats. Enter LR score from page 12.

Human Food Chain Threat Targets (T)

8. The only human food chain targets are fisheries. A fishery is an area of a surface water body from which food chain organisms are taken or could be taken for human consumption on a subsistence, sporting, or commercial basis. Food chain organisms include fish, shellfish, crustaceans, amphibians, and amphibious reptiles. Fisheries are delineated by changes in surface water body type (i.e., streams and rivers, lakes, coastal tidal waters, and oceans/Great Lakes) and whenever the flow characteristics of a stream or river change.

In the space provided, identify all fisheries within the target distance limit. Indicate the surface water body type and flow for each fishery. Gauging station flow data are available for many surface water bodies from USGS or other sources. In the absence of gauging station data, estimate flow using the list of surface water body types and associated flow categories in PA Table 4 (page 13). The flow for lakes is determined by the sum of flows of streams entering or leaving the lake. Note that, if there are no fisheries within the target distance limit, the Human Food Chain Threat Targets score is zero.

9. **Primary fisheries** are any fisheries within the target distance limit that you suspect have been exposed to a hazardous substance released from the site. Use professional judgment guided by the Surface Water Pathway Criteria List (page 11) to make this determination. If you identify any primary fisheries, list them in the space provided, enter 300 as the Primary Fisheries factor score, and do not evaluate Secondary Fisheries. Note that if you do not suspect a release, there can be no primary fisheries.

10. **Secondary fisheries** are fisheries that you do not suspect have been exposed to a hazardous substance. Evaluate this factor only if fisheries are present within the target distance limit, but none is considered a primary fishery.

A. If you suspect a release to surface water and have identified a secondary fishery but no primary fishery, assign a score of 210.

B. If you do not suspect a release, evaluate this factor based on flow. In the absence of gauging station flow data, estimate flow using the list of surface water body types and associated flow categories in PA Table 4 (page 13). Assign a Secondary Fisheries score from the table on the scoresheet using the lowest flow at any fishery within the target distance limit. (Dilution weight multiplier does not apply to PA evaluation of this factor.)

Sum the target scores in Column A (Suspected Release) or Column B (No Suspected Release).

SURFACE WATER PATHWAY (continued)
HUMAN FOOD CHAIN THREAT SCORESHEET

LIKELIHOOD OF RELEASE		A Suspected Release	B No Suspected Release	References
Enter Surface Water Likelihood of Release score from page 12.	LR =	(550) 550	(500, 400, 300 or 100)	

HUMAN FOOD CHAIN THREAT TARGETS

8. Record the water body type and flow (if applicable) for each fishery within the target distance limit. If there is no fishery within the target distance limit, assign a Targets score of 0 at the bottom of the page.

Fishery Name	Water Body Type	Flow
Barber Creek	Creek	<10 cfs
		cfs
		cfs
		cfs
		cfs

Figure 9

9. PRIMARY FISHERIES: If you suspect any fishery listed above has been exposed to a hazardous substance from the site (see Surface Water Criteria List, page 11), assign a score of 300 and do not evaluate Factor 10. List the primary fisheries:

_____, _____,
_____, _____.

(300)

10. SECONDARY FISHERIES

A. If you suspect a release to surface water and have identified a secondary fishery but no primary fishery, assign a score of 210.

(210) 210

Figure 9

B. If you do not suspect a release, assign a Secondary Fisheries score from the table below using the lowest flow at any fishery within the target distance limit.

Lowest Flow	Secondary Fisheries Score
< 10 cfs	210
10 to 100 cfs	30
> 100 cfs, coastal tidal waters, oceans, or Great Lakes	12

(210, 30, or 12)

T = (300, 210, or 0) 210 | (210, 30, 12 or 0)

SURFACE WATER PATHWAY ENVIRONMENTAL THREAT SCORESHEET

Likelihood of Release (LR)

LR is the same for all surface water pathway threats. Enter LR score from page 12.

Environmental Threat Targets (T)

11. PA Table 5 (page 16) lists sensitive environments for the Surface Water Pathway Environmental Threat. In the space provided, identify all sensitive environments located within the target distance limit. Indicate the surface water body type and flow at each sensitive environment. Gauging station flow data for many surface water bodies are available from USGS or other sources. In the absence of gauging station data, estimate flow using the list of surface water body types and associated flow categories in PA Table 4 (page 13). The flow for lakes is determined by the sum of flows of streams entering or leaving the lake. Note that if there are no sensitive environments within the target distance limit, the Environmental Threat Targets score is zero.

12. **Primary sensitive environments** are surface water sensitive environments within the target distance limit that you suspect have been exposed to a hazardous substance released from the site. Use professional judgment guided by the Surface Water Pathway Criteria List (page 11) to make this determination. If you identify any primary sensitive environments, list them in the space provided, enter 300 as the Primary Sensitive Environments factor score, and do not evaluate Secondary Sensitive Environments. Note that if you do not suspect a release, there can be no primary sensitive environments.

13. **Secondary sensitive environments** are surface water sensitive environments that you do not suspect have been exposed to a hazardous substance. Evaluate this factor only if surface water sensitive environments are present within the target distance limit, but none is considered a primary sensitive environment. Evaluate secondary sensitive environments based on flow.

- In the table provided, list all secondary sensitive environments on surface water bodies with flow of 100 cfs or less.

  1) Use PA Table 4 (page 13) to determine the appropriate dilution weight for each.

  2) Use PA Tables 5 and 6 (page 16) to determine the appropriate value for each sensitive environment type and for wetlands frontage.

  3) For a sensitive environment that falls into more than one of the categories in PA Table 5, sum the values for each type to determine the environment value (e.g., a wetland with 1.5 miles frontage (value of 50) that is also a critical habitat for a Federally designated endangered species (value of 100) would receive a total value of 150).

  4) For each sensitive environment, multiply the dilution weight by the environment type (or length of wetlands) value and record the product in the far-right column.

  5) Sum the values in the far-right column and enter the total as the Secondary Sensitive Environments score. Do not evaluate part B of this factor.

- If all secondary sensitive environments are on surface water bodies with flows greater than 100 cfs, assign 10 as the Secondary Sensitive Environments score.

Sum the target scores in Column A (Suspected Release) or Column B (No Suspected Release).

SURFACE WATER PATHWAY (continued)
ENVIRONMENTAL THREAT SCORESHEET

LIKELIHOOD OF RELEASE		A Suspected Release	B No Suspected Release	References
Enter Surface Water Likelihood of Release score from page 12.	LR =	550		

ENVIRONMENTAL THREAT TARGETS

11. Record the water body type and flow (if applicable) for each surface water sensitive environment within the target distance limit (see PA Tables 4 and 5). If there is no sensitive environment within the target distance limit, assign a Targets score of 0 at the bottom of the page.

Environment Name	Water Body Type	Flow
Paluvial wetlands on Barber Creek	Creek	20 cfs
		cfs
		cfs
		cfs
		cfs

Reference 8

12. PRIMARY SENSITIVE ENVIRONMENTS: If you suspect any sensitive environment listed above has been exposed to a hazardous substance from the site (see Surface Water Criteria List, page 11), assign a score of 300 and do not evaluate factor 13. List the primary sensitive environments:

_____, _____,
_____, _____.

13. SECONDARY SENSITIVE ENVIRONMENTS: If sensitive environments are present, but none is a primary sensitive environment, evaluate Secondary Sensitive Environments based on flow.

A. For secondary sensitive environments on surface water bodies with flows of 100 cfs or less, assign scores as follows, and do not evaluate part B of this factor:

Flow	Dilution Weight (PA Table 4)	Environment Type and Value (PA Tables 5 and 6)	Total
cfs	.1 x	Wetland =	15
cfs	x	=	
cfs	x	=	
cfs	x	=	
cfs	x	=	

Sum = 15

Reference 8

B. If all secondary sensitive environments are located on surface water bodies with flows >100 cfs, assign a score of 10.

T = 15

PA TABLE 5: SURFACE WATER AND AIR PATHWAY SENSITIVE ENVIRONMENTS VALUES

Sensitive Environment	*Assigned Value*
Critical habitat for Federally designated endangered or threatened species	100
Marine Sanctuary	
National Park	
Designated Federal Wilderness Area	
Ecologically important areas identified under the Coastal Zone Wilderness Act	
Sensitive Areas identified under the National Estuary Program or Near Coastal Water Program of the Clean Water Act	
Critical Areas Identified under the Clean Lakes Program of the Clean Water Act (subareas in lakes or entire small lakes)	
National Monument (air pathway only)	
National Seashore Recreation Area	
National Lakeshore Recreation Area	
Habitat known to be used by Federally designated or proposed endangered or threatened species	75
National Preserve	
National or State Wildlife Refuge	
Unit of Coastal Barrier Resources System	
Federal land designated for the protection of natural ecosystems	
Administratively Proposed Federal Wilderness Area	
Spawning areas critical for the maintenance of fish/shellfish species within a river system, bay, or estuary	
Migratory pathways and feeding areas critical for the maintenance of anadromous fish species in a river system	
Terrestrial areas utilized for breeding by large or dense aggregations of vertebrate animals (air pathway) or semi-aquatic foragers (surface water pathway)	
National river reach designated as Recreational	
Habitat known to be used by State designated endangered or threatened species	50
Habitat known to be used by a species under review as to its Federal endangered or threatened status	
Coastal Barrier (partially developed)	
Federally designated Scenic or Wild River	
State land designated for wildlife or game management	25
State designated Scenic or Wild River	
State designated Natural Area	
Particular areas, relatively small in size, important to maintenance of unique biotic communities	
State designated areas for protection/maintenance of aquatic life under the Clean Water Act	5
Wetlands	See PA Table 6 (Surface Water Pathway) or PA Table 9 (Air Pathway)

PA TABLE 6: SURFACE WATER PATHWAY WETLANDS FRONTAGE VALUES

Total Length of Wetlands	*Assigned Value*
Less than 0.1 mile	0
0.1 to 1 mile	25
Greater than 1 to 2 miles	50
Greater than 2 to 3 miles	75
Greater than 3 to 4 miles	100
Greater than 4 to 8 miles	150
Greater than 8 to 12 miles	250
Greater than 12 to 16 miles	350
Greater than 16 to 20 miles	450
Greater than 20 miles	500

SURFACE WATER PATHWAY WASTE CHARACTERISTICS, THREAT, AND PATHWAY SCORES

Waste Characteristics (WC)

14. **Waste Characteristics:** Score is assigned from page 4. However, if a primary target has been identified for any surface water threat, assign either the score calculated on page 4 or a score of 32, whichever is greater.

Surface Water Pathway Threat Scores

Fill in the matrix with the appropriate scores from the previous pages. To calculate the score for each threat: multiply the scores for LR, T, and WC; divide the product by 82,500; and round the result to the nearest integer. The Drinking Water Threat and Human Food Chain Threat are each subject to a maximum of 100. The Environmental Threat is subject to a maximum of 60. Enter the rounded threat scores in the far-right column.

Surface Water Pathway Score

Sum the individual threat scores to determine the Surface Water Pathway Score. If the sum is greater than 100, assign 100.

SURFACE WATER PATHWAY (concluded)
WASTE CHARACTERISTICS, THREAT, AND PATHWAY SCORE SUMMARY

WASTE CHARACTERISTICS	A *Suspected Release*	B *No Suspected Release*
14. A. If you have identified any primary target for surface water (pages 12, 14, or 15), assign the waste characteristics score calculated on page 4, or a score of 32, whichever is GREATER; do not evaluate part B of this factor.	(100 or 32)	
B. If you have NOT identified any primary target for surface water, assign the waste characteristics score calculated on page 4.	(100,32, or 18) 18	(100,32, or 18)
WC =	18	

SURFACE WATER PATHWAY THREAT SCORES

Threat	*Likelihood of Release (LR) Score (from page 12)*	*Targets (T) Score (pages 12, 14, 15)*	*Pathway Waste Characteristics (WC) Score (determined above)*	*Threat Score LR x T x WC / 82,500*
Drinking Water	550	5	18	(subject to a maximum of 100) 0.60
Human Food Chain	550	210	18	(subject to a maximum of 100) 25.2
Environmental	550	15	18	(subject to a maximum of 60) 1.8

SURFACE WATER PATHWAY SCORE
(Drinking Water Threat + Human Food Chain Threat + Environmental Threat)

(subject to a maximum of 100) 27.6

SOIL EXPOSURE PATHWAY CRITERIA LIST

Areas of surficial contamination can generally be assumed. This "Criteria List" helps guide the process of developing a hypothesis concerning the exposure of specific targets to a hazardous substance at the site. Use the "Resident Population" section to evaluate site and source conditions that may help identify targets likely to be exposed to a hazardous substance. The check-boxes record your professional judgment. Answers to all of the listed questions may not be available during the PA. Also, the list is not all-inclusive; if other criteria help shape your hypothesis, list them at the bottom of the page or attach an additional page.

Check the boxes to indicate a "yes," "no," or "unknown" answer to each question.

SOIL EXPOSURE PATHWAY CRITERIA LIST

SUSPECTED CONTAMINATION	*RESIDENT POPULATION*			
	Yes	No	Unk	
Surficial contamination can generally be assumed.	☐	☒	☐	Is any residence, school, or daycare facility on or within 200 feet of an area of suspected contamination?
	☐	☒	☐	Is any residence, school, or daycare facility located on adjacent land previously owned or leased by the site owner/operator?
	☐	☒	☐	Is there a migration route that might spread hazardous substances near residences, schools, or daycare facilities?
	☐	☐	☒	Have onsite or adjacent residents or students reported adverse health effects, exclusive of apparent drinking water or air contamination problems?
	☐	☒	☐	Does any neighboring property warrant sampling?
	☐	☒		Other criteria?_____
	☐	☒		**RESIDENT POPULATION IDENTIFIED?**

Summarize the rationale for Resident Population (attach an additional page if necessary):

The site is within an industrial area and is surrounded by property which is either industrial or vacant land and there are no residents.

SOIL EXPOSURE PATHWAY SCORESHEET

Pathway Characteristics

Answer the questions at the top of the page. Identify people who may be exposed to a hazardous substance because they work at the facility, or reside or attend school or daycare on or within 200 feet of an area of suspected contamination. If the site is active, estimate the number of full and part-time workers. Note that evaluation of targets is based on current site conditions.

Likelihood of Exposure (LE)

1. **Suspected Contamination:** Areas of surficial contamination are present at most sites, and a score of 550 can generally be assigned as a default measure. Assign zero, which effectively eliminates the pathway from further consideration, only if there is no surficial contamination; reliable analytical data are generally necessary to make this determination.

Resident Population Threat Targets (T)

2. **Resident Population** corresponds to "primary targets" for the migration pathways. Use professional judgment guided by the Soil Exposure Pathway Criteria List (page 18) to determine if there are people living or attending school or daycare on or within 200 feet of areas of suspected contamination. Record the number of people identified as resident population and multiply by 10 to determine the Resident Population factor score.

3. **Resident Individual:** Assign 50 if you have identified a resident population; otherwise, assign zero.

4. **Workers:** Estimate the number of full and part-time workers at this facility and adjacent facilities where contamination is also suspected. Assign a score for the Workers factor from the table.

5. **Terrestrial Sensitive Environments:** In the table provided, list each terrestrial sensitive environment located on an area of suspected contamination. Use PA Table 7 (page 20) to assign a value for each. Sum the values and assign the total as the factor score.

6. **Resources:** A score of 5 can generally be assigned as a default measure. Assign zero only if there is no land resource use on an area of suspected contamination.

Sum the target scores.

Waste Characteristics (WC)

7. Enter the WC score determined on page 4.

Resident Population Threat Score: Multiply the scores for LE, T, and WC. Divide the product by 82,500. Round the result to the nearest integer. If the result is greater than 100, assign 100.

Nearby Population Threat Score: Do not evaluate this threat if you gave a zero score to Likelihood of Exposure. Otherwise, assign a score based on the population within a 1-mile radius (use the same 1-mile radius population you evaluate for air pathway population targets):

Population Within One Mile	Nearby Population Threat Score
< 10,000	1
10,000 to 50,000	2
>50,000	4

Soil Exposure Pathway Score: Sum the Resident Population Threat score and the Nearby Population Threat score, subject to a maximum of 100.

SOIL EXPOSURE PATHWAY SCORESHEET

Pathway Characteristics		
Do any people live on or within 200 ft of areas of suspected contamination?	Yes ___	No X
Do any people attend school or daycare on or within 200 ft of areas of suspected contamination?	Yes ___	No X
Is the facility active? Yes X No ___ If yes, estimate the number of workers: 9		

LIKELIHOOD OF EXPOSURE	Suspected Contamination	References
1. SUSPECTED CONTAMINATION: Surficial contamination can generally be assumed, and a score of 550 assigned. Assign zero only if the absence of surficial contamination can be confidently demonstrated. LE =	550	Appendix I

RESIDENT POPULATION THREAT TARGETS		
2. RESIDENT POPULATION: Determine the number of people occupying residences or attending school or daycare on or within 200 feet of areas of suspected contamination (see Soil Exposure Pathway Criteria List, page 18). ___ people x 10 =	0	___
3. RESIDENT INDIVIDUAL: If you have identified a resident population (factor 2), assign a score of 50; otherwise, assign a score of 0.	0	___
4. WORKERS: Use the following table to assign a score based on the total number of workers at the facility and nearby facilities with suspected contamination:	5	Appendix I
5. TERRESTRIAL SENSITIVE ENVIRONMENTS: Use PA Table 7 to assign a value for each terrestrial sensitive environment on an area of suspected contamination: Sum =	0	___
6. RESOURCES	5	___
T =	10	

Number of Workers	Score
0	0
1 to 100	5
101 to 1,000	10
>1,000	15

Terrestrial Sensitive Environment Type	Value
___	___
___	___

WASTE CHARACTERISTICS	
7. Assign the waste characteristics score calculated on page 4. WC =	18

RESIDENT POPULATION THREAT SCORE: $\frac{LE \times T \times WC}{82,500}$ = 1.2

NEARBY POPULATION THREAT SCORE: 1 — Appendix I

SOIL EXPOSURE PATHWAY SCORE:
Resident Population Threat + Nearby Population Threat = 2.2

PA TABLE 7: SOIL EXPOSURE PATHWAY TERRESTRIAL SENSITIVE ENVIRONMENT VALUES

Terrestrial Sensitive Environment	*Assigned Value*
Terrestrial critical habitat for Federally designated endangered or threatened species	100
National Park	
Designated Federal Wilderness Area	
National Monument	
Terrestrial habitat known to be used by Federally designated or proposed threatened or endangered species	75
National Preserve (terrestrial)	
National or State terrestrial Wildlife Refuge	
Federal land designated for protection of natural ecosystems	
Administratively proposed Federal Wilderness Area	
Terrestrial areas utilized by large or dense aggregations of animals (vertebrate species) for breeding	
Terrestrial habitat used by State designated endangered or threatened species	50
Terrestrial habitat used by species under review for Federal designated endangered or threatened status	
State lands designated for wildlife or game management	25
State designated Natural Areas	
Particular areas, relatively small in size, important to maintenance of unique biotic communities	

AIR PATHWAY CRITERIA LIST

SUSPECTED RELEASE				PRIMARY TARGETS
Yes	No	Unk		
☐	☐	☒	Are odors currently reported?	If you suspect a release to air, evaluate all populations and sensitive environments within 1/4 mile (including those onsite) as primary targets.
☐	☐	☒	Has release of a hazardous substance to the air been directly observed?	
☐	☐	☒	Are there reports of adverse health effects (e.g., headaches, nausea, dizziness) potentially resulting from migration of hazardous substances through the air?	
☐	☒	☐	Does analytical or circumstantial evidence suggest a release to the air?	
☐	☒		Other criteria?_____	
☐	☒		**SUSPECTED RELEASE?**	

Summarize the rationale for Suspected Release (attach an additional page if necessary):

Although the site was used in the past for manufacturing operations which might have produced air pollution, for the past several years the site has been used only as a warehouse.

AIR PATHWAY SCORESHEET

Pathway Characteristics

Answer the questions at the top of the page. Refer to the Air Pathway Criteria List (page 21) to hypothesize whether you suspect that a hazardous substance release to the air could be detected. Due to dispersion, releases to air are not as persistent as releases to water migration pathways and are much more difficult to detect. Develop your hypothesis concerning the release of hazardous substances to air based on "real time" considerations. Record the distance (in feet) from any source to the nearest regularly occupied building.

Likelihood of Release (LR)

1. **Suspected Release:** Hypothesize based on professional judgment guided by the Air Pathway Criteria List (page 21). If you suspect a release to air, use only Column A for this pathway and do not evaluate factor 2.

2. **No Suspected Release:** If you do not suspect a release, enter 500 and use only Column B for this pathway.

Targets (T)

3. **Primary Target Population:** Evaluate populations subject to exposure from release of a hazardous substance from the site. If you suspect a release, the resident, student, and worker populations on and within ¼ mile of the site are considered primary target population. If only the number of residences is known, use the average county residents per household (rounded up to the next integer) to determine the population. In the space provided, enter this population. Multiply the population by 10 to determine the Primary Target Population score. Note that if you do not suspect a release, there can be no primary target population.

4. **Secondary Target Population:** Evaluate populations in distance categories not suspected to be subject to exposure from release of a hazardous substance from the site. If you suspect a release, residents, students, and workers in the ¼- to 4-mile distance categories are secondary target population. If you do not suspect a release, all residents, students, and workers onsite and within 4 miles are considered secondary target population.

Use PA Table 8 (page 23). Enter the population in each secondary target population distance category, circle the assigned value, and record it on the far-right side of the table. Sum the far-right column and enter the total as the Secondary Target Population factor score.

5. **Nearest Individual** represents the threat posed to the person most likely to be exposed to a hazardous substance release from the site. If you have identified a primary target population, enter 50. Otherwise, assign the score from PA Table 8 (page 23) for the closest distance category in which you have identified a secondary target population.

6. **Primary Sensitive Environments:** If a release is suspected, all sensitive environments on or within ¼ mile of the site are considered primary targets. List them and assign values for sensitive environment type (from PA Table 5, page 16) and/or wetland acreage (from PA Table 9, page 23). Sum the values and enter the total as the factor score.

7. **Secondary Sensitive Environments:** If a release is suspected, sensitive environments in the ¼- to ½-mile distance category are secondary targets; greater distances need not be evaluated because distance weighting greatly diminishes the impact on site score. If you do not suspect a release, all sensitive environments on and within ½ mile of the site are considered secondary targets. List each secondary sensitive environment on PA Table 10 (page 23) and assign a value to each using PA Tables 5 and 9. Multiply each value by the indicated distance weight and record the product in the far-right column. Sum the products and enter the total as the factor score.

8. **Resources:** A score of 5 can generally be assigned as a default measure. Assign zero only if there is no land resource use within ½ mile.

Sum the target scores in Column A (Suspected Release) or Column B (No Suspected Release).

Waste Characteristics (WC)

9. **Waste Characteristics:** Score is assigned from page 4. However, if you have identified any primary target for the air pathway, assign either the score calculated on page 4 or a score of 32, whichever is greater.

Air Pathway Score: Multiply the scores for LR, T, and WC. Divide the product by 82,500. Round the result to the nearest integer. If the result is greater than 100, assign 100.

AIR PATHWAY SCORESHEET

Pathway Characteristics	
Do you suspect a release (see Air Pathway Criteria List, page 21)?	Yes ___ No X
Distance to the nearest individual:	___ ft

	A *Suspected Release*	B *No Suspected Release*	*References*
LIKELIHOOD OF RELEASE			
1. SUSPECTED RELEASE: If you suspect a release to air (see page 21), assign a score of 550. Use only column A for this pathway.	(550)		
2. NO SUSPECTED RELEASE: If you do not suspect a release to air, assign a score of 500. Use only column B for this pathway.		(500) 500	Appendix 1
LR =		500	
TARGETS			
3. PRIMARY TARGET POPULATION: Determine the number of people subject to exposure from a suspected release of hazardous substances to the air. ___ people x 10 =			
4. SECONDARY TARGET POPULATION: Determine the number of people not suspected to be exposed to a release to air, and assign the total population score using PA Table 8.		6	Table 1
5. NEAREST INDIVIDUAL: If you have identified any Primary Target Population for the air pathway, assign a score of 50; otherwise, assign the Nearest Individual score from PA Table 8.	(50, 20, 7, 2, 1, or 0)	(20, 7, 2, 1, or 0) 20	Table 1
6. PRIMARY SENSITIVE ENVIRONMENTS: Sum the sensitive environment values (PA Table 5) and wetland acreage values (PA Table 9) for environments subject to exposure from a suspected release to the air.			
Sum =			
7. SECONDARY SENSITIVE ENVIRONMENTS: Use PA Table 10 to determine the score for secondary sensitive environments.		0	
8. RESOURCES	(5 or 0)	(5 or 0) 5	
T =		31	
WASTE CHARACTERISTICS			
9. A. If you have identified any Primary Target for the air pathway, assign the waste characteristics score calculated on page 4, or a score of 32, whichever is GREATER; do not evaluate part B of this factor.	(100 or 32)		
B. If you have NOT identified any Primary Target for the air pathway, assign the waste characteristics score calculated on page 4.	(100, 32, or 18)	(100, 32, or 18) 18	
WC =		18	

AIR PATHWAY SCORE: $\frac{LR \times T \times WC}{82{,}500}$ = 3.38 (adjusted to a maximum of 100)

PA TABLE 8: VALUES FOR SECONDARY AIR TARGET POPULATIONS

Distance from Site	Population	Nearest Individual (choose highest)	Population Within Distance Category: 1 to 10	11 to 30	31 to 100	101 to 300	301 to 1,000	1,001 to 3,000	3,001 to 10,000	10,001 to 30,000	30,001 to 100,000	100,001 to 300,000	300,001 to 1,000,000	Greater than 1,000,000	Population Value
Onsite	0	20	1	2	5	16	52	163	521	1,633	5,214	16,325	52,136	163,246	0
>0 to ¼ mile	32	20	1	1	1	4	13	41	130	408	1,303	4,081	13,034	40,811	1
> ¼ to ½ mile	70	2	0	0	1	1	3	9	28	88	282	882	2,815	8,815	1
> ½ to 1 mile	271	1	0	0	0	1	1	3	8	26	83	261	834	2,612	1
> 1 to 2 miles	1342	0	0	0	0	0	1	1	3	8	27	83	266	833	1
> 2 to 3 miles	3432	0	0	0	0	0	1	1	1	4	12	38	120	376	1
> 3 to 4 miles	5863	0	0	0	0	0	0	1	1	2	7	23	73	229	1

Nearest Individual = _____ Score = 6

PA TABLE 9: AIR PATHWAY VALUES FOR WETLAND AREA

Wetland Area	Assigned Value
Less than 1 acre	0
1 to 50 acres	25
Greater than 50 to 100 acres	75
Greater than 100 to 150 acres	125
Greater than 150 to 200 acres	175
Greater than 200 to 300 acres	250
Greater than 300 to 400 acres	350
Greater than 400 to 500 acres	450
Greater than 500 acres	500

PA TABLE 10: DISTANCE WEIGHTS AND CALCULATIONS FOR AIR PATHWAY SECONDARY SENSITIVE ENVIRONMENTS

Distance	Distance Weight	Sensitive Environment Type and Value (from PA Table 5 or 9)	Product
Onsite	0.10	x	
		x	
0-1/4 mi	0.025	x	
		x	
		x	
1/4-1/2mi	0.0054	x	
		x	
		x	
		x	

Total Environments Score = _____

SITE SCORE CALCULATION

In the column labeled S, record the Ground Water Pathway score, the Surface Water Pathway score, the Soil Exposure Pathway score, and the Air Pathway score. Square each pathway score and record the result in the S^2 column. Sum the squared pathway scores. Divide the sum by 4, and take the square root of the result to obtain the **Site Score**.

SUMMARY

Answer the summary questions, which ask for a qualitative evaluation of the relative risk of targets being exposed to a hazardous substance from the site. You may find your responses to these questions a good cross-check against the way you scored the individual pathways. For example, if you scored the ground water pathway on the basis of no suspected release and secondary targets only, yet your response to question #1 is "yes," this presents apparently conflicting conclusions that you need to reconsider and resolve. Your answers to the questions on page 24 should be consistent with your evaluations elsewhere in the PA scoresheets package.

SITE SCORE CALCULATION

	S	S^2
GROUND WATER PATHWAY SCORE (S_{gw}):	5.88	34.57
SURFACE WATER PATHWAY SCORE (S_{sw}):	27.60	761.76
SOIL EXPOSURE PATHWAY SCORE (S_s):	2.20	4.84
AIR PATHWAY SCORE (S_a):	3.38	11.42
SITE SCORE: $\sqrt{\frac{S_{gw}^2+S_{sw}^2+S_s^2+S_a^2}{4}}$		14.25

SUMMARY

	YES	NO
1. Is there a high possibility of a threat to any nearby drinking water well(s) by migration of a hazardous substance in ground water?	☐	☒
A. If yes, identify the well(s). _____		
B. If yes, how many people are served by the threatened well(s)? _____		
2. Is there a high possibility of a threat to any of the following by hazardous substance migration in surface water?		
A. Drinking water intake	☐	☒
B. Fishery	☐	☒
C. Sensitive environment (wetland, critical habitat, others)	☐	☒
D. If yes, identify the target(s). _____		
3. Is there a high possibility of an area of surficial contamination within 200 feet of any residence, school, or daycare facility? If yes, identify the property(ies) and estimate the associated population(s). _____	☐	☒
4. Are there public health concerns at this site that are not addressed by PA scoring considerations? If yes, explain: _____	☐	☒

From: Greg Thomas
To: Deadre Embrey
Date: 9/7/95 4:20pm
Subject: Discovery Sites -Reply

Palm Harbor Homes
976 Airport Road
Winder, Barrow County, GA 30680
I don't have the latitude and longitude, but I will get them to you as soon as I get them. According to the facility's remediation contractor, all hazardous waste has been removed from the site. The waste was classified as flammable liquied (mineral spirits, alcohol). I haven't been back to verify the removal. The file is in the Generator Compliance Program Barrow County file at Suite 1066, East Tower.

>>> Deadre Embrey 9/7/95, 03:34pm >>>
A couple of months ago ya'll responded to an E-Mail regarding potential Discovery Sites for our FY-96 work plan. It is almost certain that these sites will be on our work plan for FY-96. Could you please help me out by providing the following information for these sites - location (address, city, county), latitude, longitude, brief description of potential contaminants, and the location of file/information. I need the information as soon as possible. Thanks.

In case you have forgotten the site you recommended, see the following:

Ray Fine Complaint - Steve White
White Trucking - Steve White
Han Har Metal Finishing - Eddie Williams
Palm Harbor Homes - Greg Thomas