

**SITE INSPECTION  
BURLINGTON INDUSTRIES CHERAW  
SCS 123 457 698  
CHERAW, SOUTH CAROLINA  
CHESTERFIELD COUNTY**

**Prepared for:**



**U.S. ENVIRONMENTAL PROTECTION AGENCY  
Region 4  
61 Forsyth Street  
Atlanta, Georgia 30303**

**Prepared by:**



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September 27, 2016

  
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## 1.0 INTRODUCTION

Under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA), the Federal and State Site Assessment Section, South Carolina Department of Health and Environmental Control (DHEC) has conducted a Site Inspection (SI) for the Burlington Industries Cheraw site (the Site) in Chesterfield County, South Carolina. The information gathered from this investigation will be used to decide future CERCLA activity at the site.

## 2.0 LOCATION

The site is located at 650 Chesterfield Highway within the city limits of Cheraw, in Chesterfield County. The site encompasses an approximate 50-acre parcel with a large manufacturing complex (now owned and operated as Highland Industries), and multiple residential lots to the north and northwest (developed and vacant) where former sludge drying beds were located. When Burlington Industries originally built the plant in the late 1950's, the lots were part of the plant property (Ref. 7). The geographic coordinates of the Site are 34.695531° N, -79.913499° W (Appendix B).

## 3.0 OWNERSHIP

Manufacturing Facility:

1988- present  
Highland Industries  
Takata Corporation of Japan (Parent Company)  
650 Chesterfield Hwy  
Cheraw, SC 29520

Opened 1961 by Burlington Industries, also known as James Fabric Plant

Residential Lots:

<u>Vacant Little John Rd Parcel</u>	<u>601 Robin Hood Dr</u>
Gregory J and Janet T Killalea	Melvin and Karen L Wilkerson
205 Fetterbush Rd	601 Robin Hood Dr
Elgin, SC 29045	Cheraw, SC 29520

(Ref. 7)

#### 4.0 SITE HISTORY / DESCRIPTION

In October 2015, the SCDHEC Site Assessment section was contacted by a resident that had reason to believe that some sort of wastewater unit had been historically located on his property and/or an adjacent vacant lot. Research during the PSA concluded that there had been permitted sludge drying beds located on at least one (now vacant) residential lot. Sampling for the PSA found elevated levels of PCBs (Aroclor 1248) in the vacant residential lot and the adjacent drainage ditch, which originates on the manufacturing property.

In March 1974, SCDHEC issued Construction Permit 2852-C to Burlington Industries for “a chemical pretreatment system having recycling capabilities comprising units for neutralization, chemical precipitation, dissolved air flotation and sludge handling” (Ref. 11). According to a 1989 letter from Burlington requesting permission to remove or cover remaining sludge:

*In the early to mid-1970's, the plant was applying latex and acrylic finishes along with pigment dyes and delusterants to fiberglass fabrics and some of this material was falling out in the sewer lines causing blockage problems for the city. At their request, the plant installed a settling tank and the sludges from this tank were pumped onto drying beds behind the plant.*

(Ref. 12)

Analytical data was also sent to SCDHEC but is not present in available files. The letter only mentions that the sludge had been tested in 1980 and 1989 and found to be “non-hazardous”. SCDHEC issued a waste disposal authorization to Burlington to dispose of 300 yd<sup>3</sup> of dried sludge at the Chesterfield County landfill (SCDHEC DWP-128) (Ref. 13).

A large land tract owned by Burlington Industries was sold in 1990 to a developer who subdivided it into the current residential neighborhood (Ref. 7). Based on overlays of historical aerial photography, it appears that the sludge drying beds sat predominantly on the vacant lot at the intersection of Little John Road and Robin Hood Drive. Today, this lot is mostly cleared with woods bordering south, east, and west boundaries. Noted during field activities at the site are small pieces of a dark green/dark gray rubbery sludge-like material across the lot and the adjoining lot on Robin Hood Drive. This same material is present in larger “chunks” along the western edge of the vacant lot, appearing as though the material was pushed to that side of the property as the lot was graded (Ref. 6).

SCDHEC approached Highland Industries about performing additional assessment activities at the site based on the PSA results showing elevated levels of PCBs on and around the former sludge drying bed areas. Highland Industries declined the invitation as they never owned the parcel where the drying beds were located (Ref. 15). The SCDHEC Superfund State Remedial group began a sampling effort in late August 2016 to further characterize the site. This investigation included the collection of many surface and sub-surface soil samples both on Highland Industries property and on and around the former sludge drying bed parcel. Also, many nearby residential yards were sampled, as well as additional sampling in the drainage ditch/creek leading from the site. Field PCB screening was employed (Dexsil L2000DX) to

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decide which samples would be sent for laboratory analysis (Ref. 18). Over 100 samples were collected for field screening and 56 were sent for laboratory analysis (all for Aroclors, selected samples for PCB congeners, metals, SVOAs, and VOCs). See Figures 9-11 for sampling locations for this investigation. This Site Inspection will utilize this SCDHEC-gathered analytical data to determine future Federal Superfund actions.

## 5.0 WASTE SOURCES

Sampling for this investigation as well as the earlier PSA has identified PCB contamination in a ditch beginning on Highland Industries property as well as in on-site and off-site soils. At this time the exact source of the PCB contamination is not known. It is known that the Burlington Industries Cheraw facility was built as “the world’s first giant mill for weaving glass fibers” (Ref. 19). Over time, various specialty textiles are believed to have been produced at the facility. PCB oils were used for heat transfer fluids for various industrial processes (Ref. 20). A Burlington Industries plant in Altavista, VA, that opened in 1958 and produced fiberglass fabric, documented similarly high PCB contamination in and around the facility from a roof-mounted heat exchanger (Ref. 21). Also, PCB-containing compounds were used as fabric coatings for heat and/or flame resistance (Ref. 20). For purposes of this report, the site’s waste source will be assumed to be an area of contaminated soil approximately two acres in size (approximately 1.5 acres inside the current Highland property boundary and 0.5 acres on the vacant residential lot where the sludge drying beds were historically located. Sampling for this investigation found PCBs elevated on-site as shown in Table 1 below:

**Table 1: On-site soil results - August 2016**

All values are ug/kg	BL-BKG-SS	BL-BKG-SB	BL-SS-28	BL-SB-28	BL-SB-80	BL-SS-27D	BL-SS-39
	BACKGROUND		N of Drum Storage Area		S of propane tanks	Discharge corner of sedimentation basin	At facility property line near former sludge drying bed location
	SURFACE SOIL	SUB-SURFACE SOIL	SURFACE SOIL	SUB-SURFACE SOIL	SUB-SURFACE SOIL	SURFACE SOIL	SURFACE SOIL
Aroclor 1248	9.7 U	15	1,500,000	82,000	20,000	68,000	20
Aroclor 1254	9.7 U	11 U	1,300,000	67,000	22,000	37,000	27
Notes:							
U - undetected							

## 6.0 PATHWAY EVALUATION

### 6.1 GROUNDWATER MIGRATION PATHWAY

The Town of Cheraw municipal water system provides drinking water to the area surrounding the site, sourced from an up-gradient location on the Great Pee Dee River (Ref. 2). There are no known drinking water wells within ¼-mile of the site, and due to the presence of public water lines in the area it is unlikely that any wells are located within 1 mile (Ref. 1, 3, 6). Based on the limited groundwater use in the area, the groundwater pathway was not evaluated for this report.

## 6.2 SURFACE WATER MIGRATION PATHWAY

### *Regional Characteristics / Targets*

The site lies within the Pee Dee River sub-basin (Ref. 8). A small drainage ditch that begins on Highland Industries property flows along the western edge of the vacant lot in a northerly direction approximately 1,000 feet to meet an easterly-flowing creek. This intermittent creek flows approximately one mile to the east meet the perennial Wilson Branch (Ref. 1). Wilson Branch flows in a northeasterly direction for ½-mile to meet Huckleberry Branch. Huckleberry Branch flows 1.5 miles east/southeasterly to reach the Great Pee Dee River. The 15-mile target distance limit for purposes of this report ends 13 miles downstream in the Great Pee Dee River near Bennettsville (Ref. 1). There are several ponds located along the surface water pathway near the intersection of Wilson Branch. The interaction of the creek and these ponds is not fully documented at this time. However, a branch of the creek directly flows through at least one of the three downstream ponds (Ref. 16).

The entire surface water pathway from Wilson Branch on is lined by wetlands (Ref. 1). Fishing is likely to occur in the ponds east of the site as well as Wilson Branch, Huckleberry Branch, and the Great Pee Dee River (Ref. 1, 8). A Town park is located along this creek beyond the ponds with obvious recreational use of the creek for wading/playing (Ref. 16).

### *Surface Water Impacts*

Sampling for the PSA in February 2016 found levels of PCB 1248 and several polycyclic aromatic hydrocarbons (PAHs) in two sediment samples from the ditch leaving Highland Industries at levels significantly elevated above screening values (Ref. 5). Sampling for this investigation again detected very high levels of PCBs in the ditch, both on and off current Highland Industries property (Ref. 17). Selected PCB laboratory analysis is shown below in Tables 2 and 3:

**Table 2: Selected ditch samples on Highland Industries property**

All values are ug/kg	BL-BKG-SD	BL-DS-01B	BL-SD-01	BL-SD-04	BL-DS-04	BL-SD-05	BL-SD-06	BL-DS-06
	BACKGROUND	DITCH SEDIMENTS ON HIGHLAND INDUSTRIES PROPERTY						
Aroclor 1248	19	230,000	550,000	260,000	780,000	150,000	1,000,000	1,900,000
Aroclor 1254	15 U	12,000 U	360,000	240,000	730,000	150,000	660,000	880,000
Notes:								
U - undetected								
SD - shallow sediments 0 - 6"								
DS - deep sediments generally 6-12"								

**Table 3: Sediment from ditch/creek off Highland Industries property**

All values are ug/kg	BL-BKG-SD	BL-SD-09	BL-DS-09	BL-SD-13	BL-DS-13	BL-DS-14	BL-SD-16	BL-SD-18	BL-DS-18	BL-SD-19	BL-DS-19
	BACKGROUND	DITCH SEDIMENTS OFF HIGHLAND INDUSTRIES PROPERTY BORDERING RESIDENTIAL PROPERTIES								Downstream pond	
Aroclor 1248	19	340,000	1,300,000	110,000	81,000	85,000	89,000	250,000	110,000	100	67
Aroclor 1254	15 U	260,000	710,000	73,000	56,000	7,100 U	70,000	18,000 U	82,000	45	12 U
Notes:											
U - undetected											
SD - shallow sediments 0 - 6"											
DS - deep sediments generally 6-12"											

(Ref. 17)

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Given the very high PCB detections in the ditch on-site and leaving the facility, the SCDHEC State Remedial section has begun a second phase of sampling to assess the surface water pathway all the way to the Pee Dee River. This investigation is currently underway. Additionally, several pesticides were detected at levels greatly exceeding USEPA screening values in sediment samples generally co-located with the highest PCB levels (Ref. 17). Additional evaluation of these detections is ongoing and additional full-scan laboratory analyses during the second phase will further clarify these detections.

### **6.3 SOIL EXPOSURE / AIR PATHWAYS**

#### *Regional Characteristics / Targets*

The site is located within the city limits of Cheraw, SC (Ref. 1). The city has a total population of 5,851 (Ref. 4). On-site soil is classified as Pelion loamy sand (Ref. 3). Long Junior High School is located approximately 1500 feet east of the site at the intersection of W Greene Street and Jersey Street. No schools or daycares are located within 200 feet of the site (Ref. 1, 9). Access to the site is not restricted (Ref. 6). The population within ¼-mile of the site is estimated to be 156, within ½-mile 720 (Ref. 1, 4).

#### *Soil Exposure Impacts*

February 2016 sampling for the PSA found PCB-1248 in 5 of 7 on-site soil samples at levels ranging from 300 – 14,000 ug/kg, greater than the USEPA Regional Screening Level (RSL) for residential soil of 230 ug/kg (Ref. 5, 10). Sampling for this investigation included the collection of many samples from nearby residential properties to determine if PCB contamination was present. PCBs were detected at levels greater than the RSL in most of the eight residential yards sampled (Ref. 17). Additional sampling is underway by the SCDHEC State Remedial section to further characterize the extent of contamination in each yard and to evaluate all nearby residential properties for impact. Residents have been notified of the detections and a public meeting is planned for October 2016. Selected residential soil sample data is shown below in Table 4:

**Table 4: Residential Lot Sampling - August 2016**

Sample ID	Area	Aroclor 1248	Aroclor 1254
		all values in ug/kg	
BL-SS-11A	Former Sludge Drying Bed Area - Vacant Residential Lot	130,000	100,000
BL-WA-01		260,000	10,000 U
BL-WA-2		14,000	1,000 U
BL-SS-48	Residential Yards on Pecan Drive	490,000	590,000
BL-SS-48A		4,900	7,900
BL-SS-48B		4,100	6,700
BL-SS-52		41,000	63,000
BL-SS-52A		110,000	110,000
BL-SS-52B		850	1,400
BL-SS-53		42,000	48,000
BL-SS-53A		180	300
BL-SS-70		37,000	48,000
BL-SS-73		110 U	2,400
BL-SS-74		2,100	5,300
BL-SS-75		160,000	180,000
BL-SS-75A		2,100	2,900
BL-SS-75B		610	1,800
BL-SS-75C		11 U	88
BL-SS-75D	410	610	
BL-SS-57	Residential Yards on Robin Hood Drive	4,500	3,700
BL-SS-58		12,000	7,400
BL-SS-59		9.5 U	33
BL-SS-67		1,700	2,200
BL-SS-67-DUP		1,200	1,600
Notes:			
U - undetected			

(Ref. 17)

## 7.0 SUMMARY / CONCLUSIONS

The Burlington Industries Cheraw site was initially a citizen complaint to SCDHEC questioning whether wastewater units had been located on residential property. The previous PSA confirmed the historical presence of sludge-drying beds on what is now one or two residential lots and found elevated PCBs on those properties and in the adjacent drainage ditch. Sampling for this investigation documented widespread PCB contamination in on and off-site soils, the drainage ditch that originates on the facility, and in nearby residential yards.

A second phase of assessment is underway by SCDHEC to delineate the extent of contamination in soil, and to assess the downstream surface water pathway. SCDHEC has had additional discussions with the current owner of the manufacturing facility, Highland Industries, about conducting additional assessment and/or remediation under a Voluntary Cleanup Contract (VCC). SCDHEC and Highland Industries will reconvene when analytical data from the second phase is available by mid-October 2016. Without a VCC for further assessment and remediation of all areas of concern, the site will be referred to USEPA for a Removal Site Evaluation and for potential placement on the National Priorities List (NPL).

## 8.0 REFERENCES

1. Google Earth Professional. Last accessed April 2016.
2. SCDHEC, Environmental Facility Information System (EFIS). Last accessed July 2016.
3. SoilWeb: An Online Soil Survey Browser. <http://casoilresource.lawr.ucdavis.edu/gmap/>. Accessed in March 2016.
4. US Department of Commerce. US Census Bureau Statistics. <http://censusviewer.com/city/SC/Cheraw>. Last accessed March 2016.
5. USEPA Region 4 Science and Ecosystem Support Division. Final Analytical Report for Burlington Industries Cheraw former Lagoon. VOAs - March 21, 2016, OCP/PCB – March 31, 2016, Metals – April 4, 2016, SVOA - April 8, 2016.
6. SCDHEC Site Assessment Section: Jonathan McInnis, Project Manager. Trip Report for Burlington Industries Cheraw former Lagoon XPSA, February 26, 2016.
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11. SCDHEC. Construction Permit for Wastewater Unit – Burlington Industries, Permit #2852-C, March 7, 1974.
12. Theodore H. LeJeune, P.E., Senior Environmental Engineer, Burlington Industries. Letter to Harold Seabrook, SCDHEC concerning Disposal of Sludge Residues. November 20, 1989.
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14. National Oceanic and Atmospheric Administration. Screening Quick Reference Tables for Organics – Sediment. Probable Effect Levels from MacDonald, et al, 2000. Canadian Sediment Quality Guidelines for the Protection of Aquatic Life, <http://sts.ccme.ca/en/index.html>

15. Highland Industries. Letter to David Wilkie, SCDHEC concerning the invitation to enter into a Voluntary Cleanup Contract.
16. Field Notes from SCDHEC State Remediation Section Second Phase Investigation at Burlington Industries Cheraw. September 20, 2016. Available at SCDHEC.
17. Analytical Data from SCDHEC State Remediation Investigation at Burlington Industries Cheraw. August 2016.
18. synTerra. Sediment and Soil Sampling and Analysis Workplan for SCDHEC Site Remediation Investigation at Burlington Industries Cheraw. August 2016.
19. BGF Industries Company Timeline. <http://www.bgf.com/wp-content/uploads/2014/04/timeline.pdf> last accessed September 22, 2016/
20. Oregon Department of Environmental Quality. Fact Sheet: Sources of Polychlorinated Biphenyls. <http://www.deq.state.or.us/lq/cu/nwr/PortlandHarbor/docs/SourcePCBs.pdf> Last accessed September 25, 2016.
21. Jonathan McInnis, SCDHEC. Record of Communication with Kip Foster, Virginia Department of Environmental Quality regarding the Burlington Industries Altavista facility. September 23, 2016.

**APPENDIX A: MAPS / FIGURES**

Figure 1 - General Location

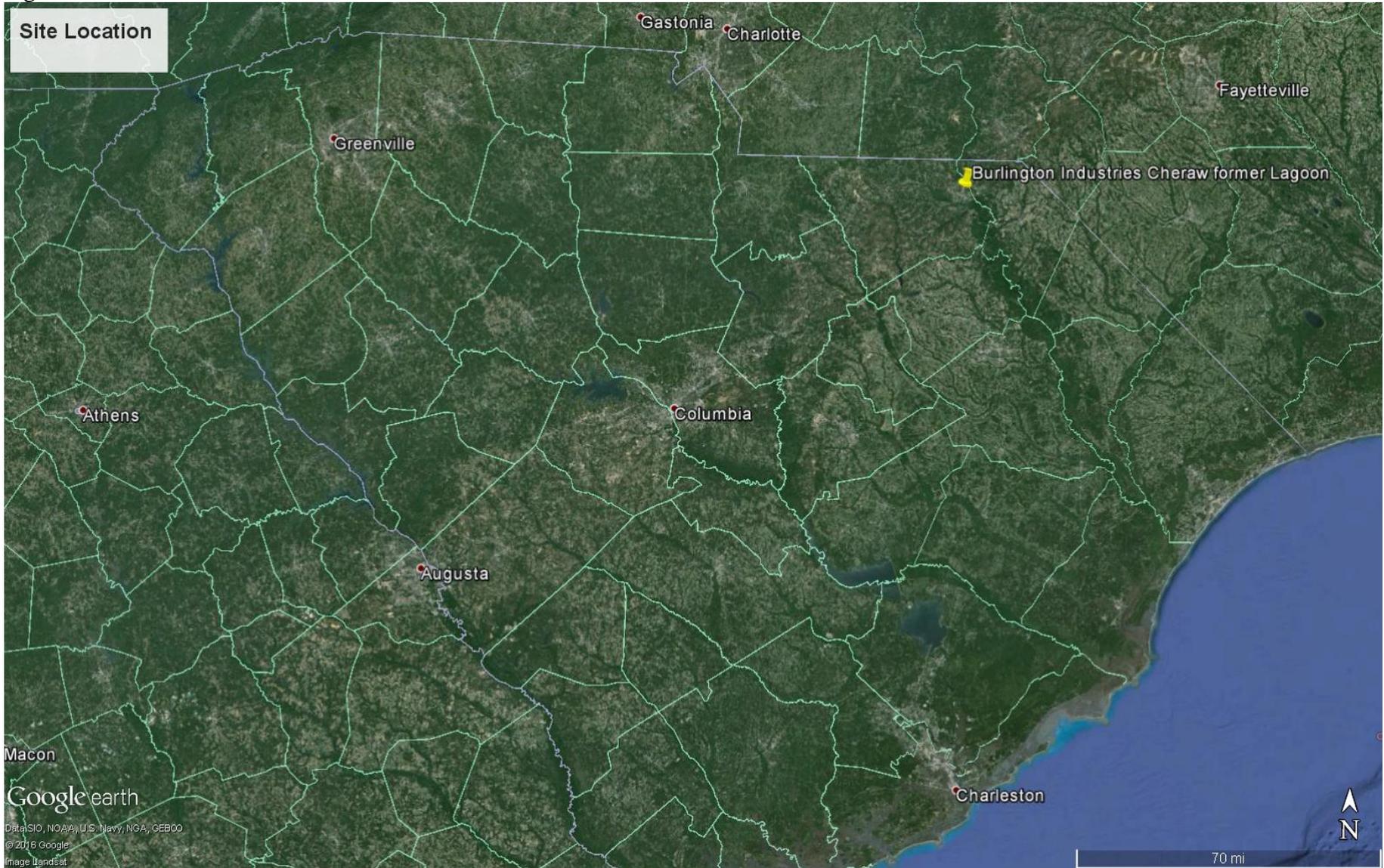


Figure 2 – Site Location in City of Cheraw

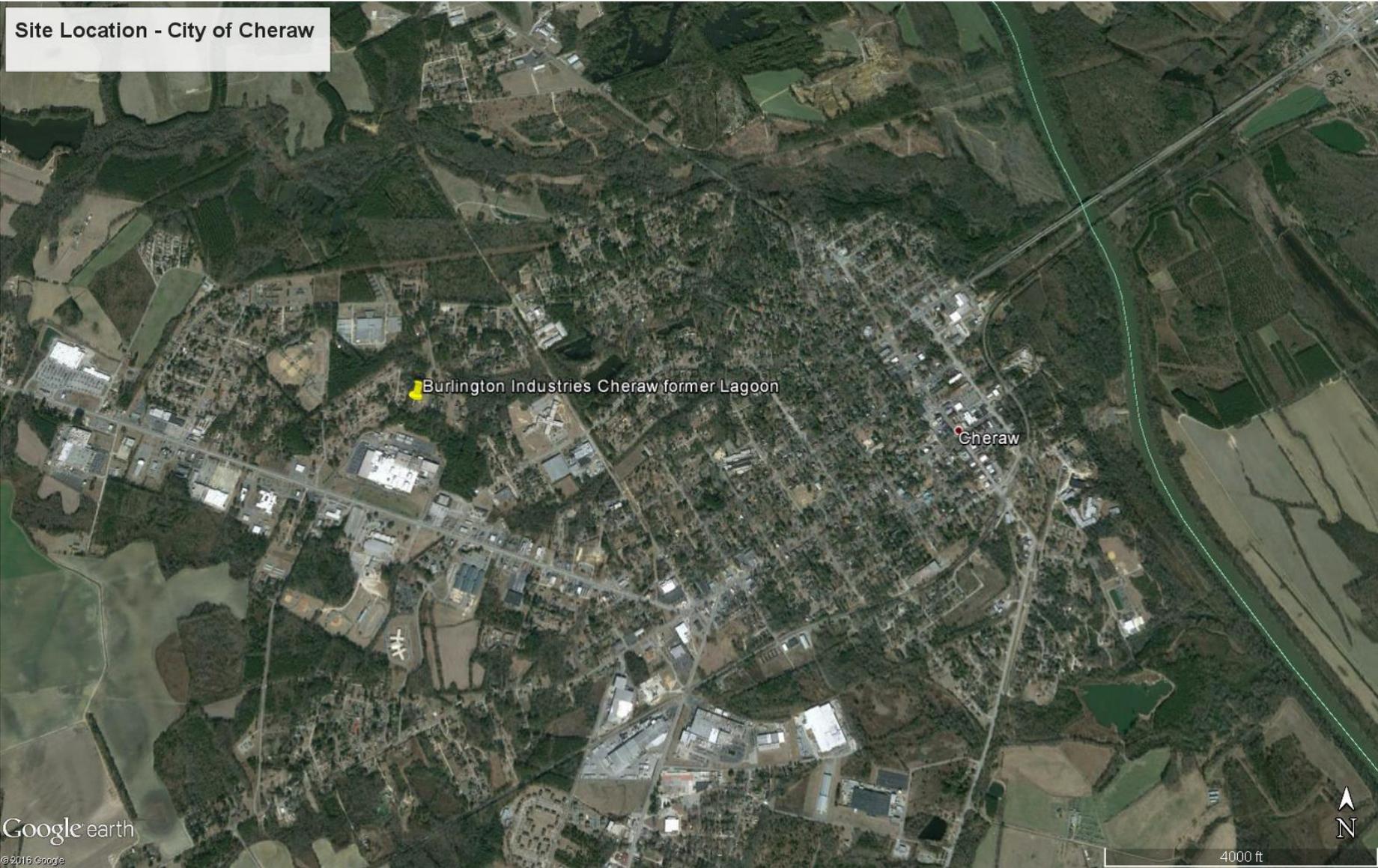


Figure 3



Figure 4 – 1975 aerial photo overlay from Google Earth



Figure 5 – 1981 aerial photo overlay from Google Earth



**Figure 6 – Surface Water Pathway to Great Pee Dee River**

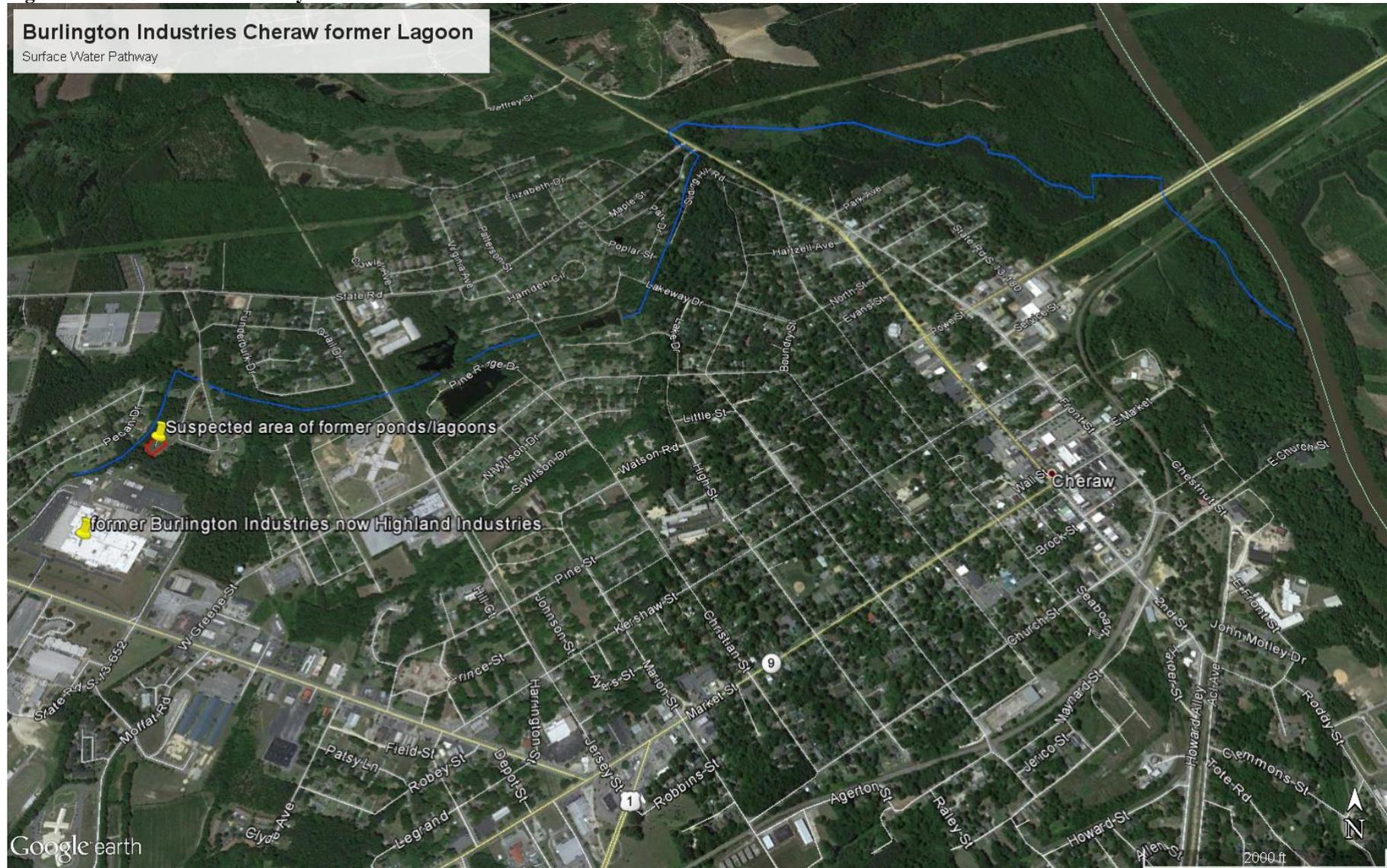
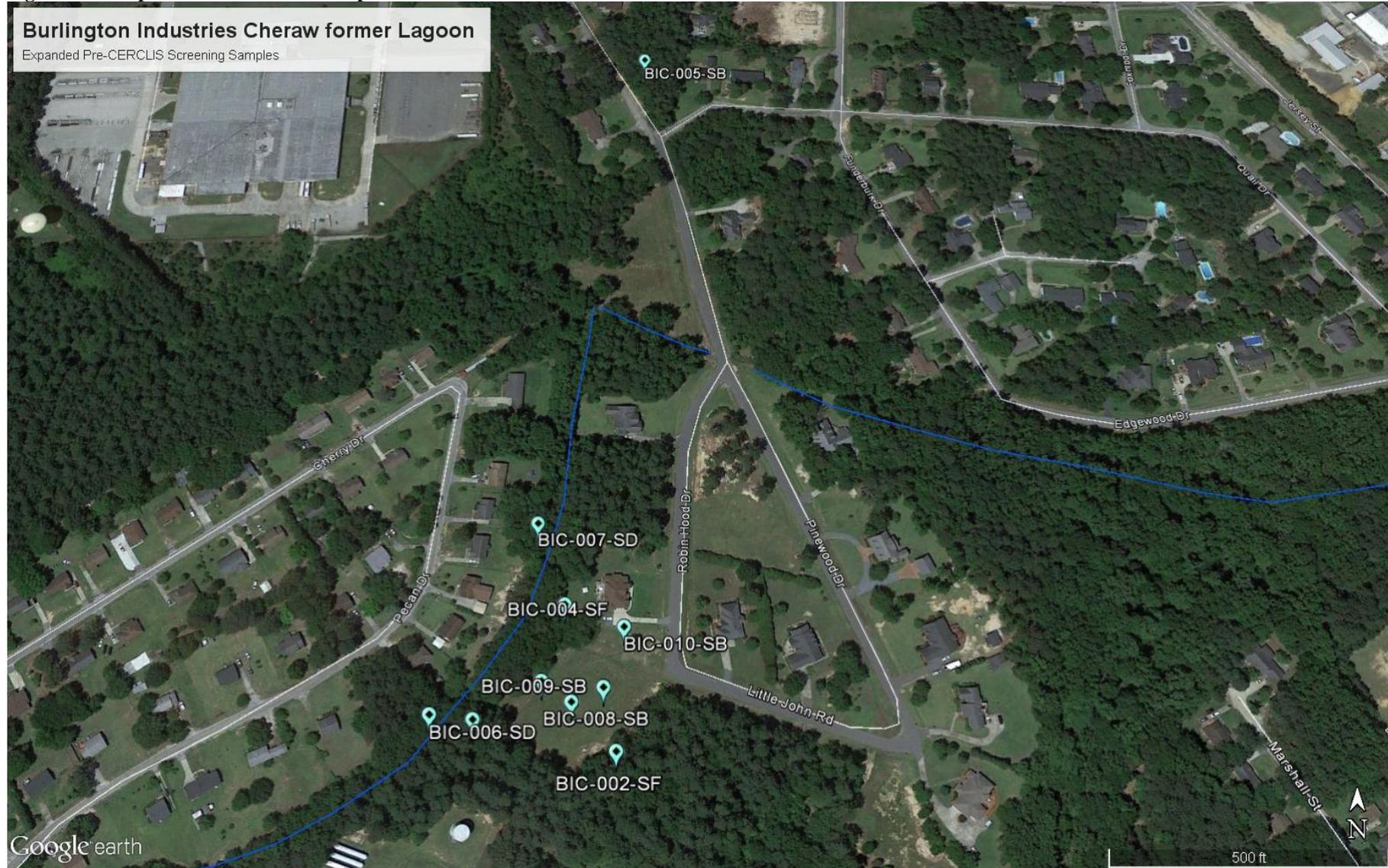


Figure 7 – Samples collected for 2016 Expanded PSA



**Figure 8 – 2016 Expanded PSA Samples – close-up**



Figure 9 : SCDHEC PCB Screening - August 2016

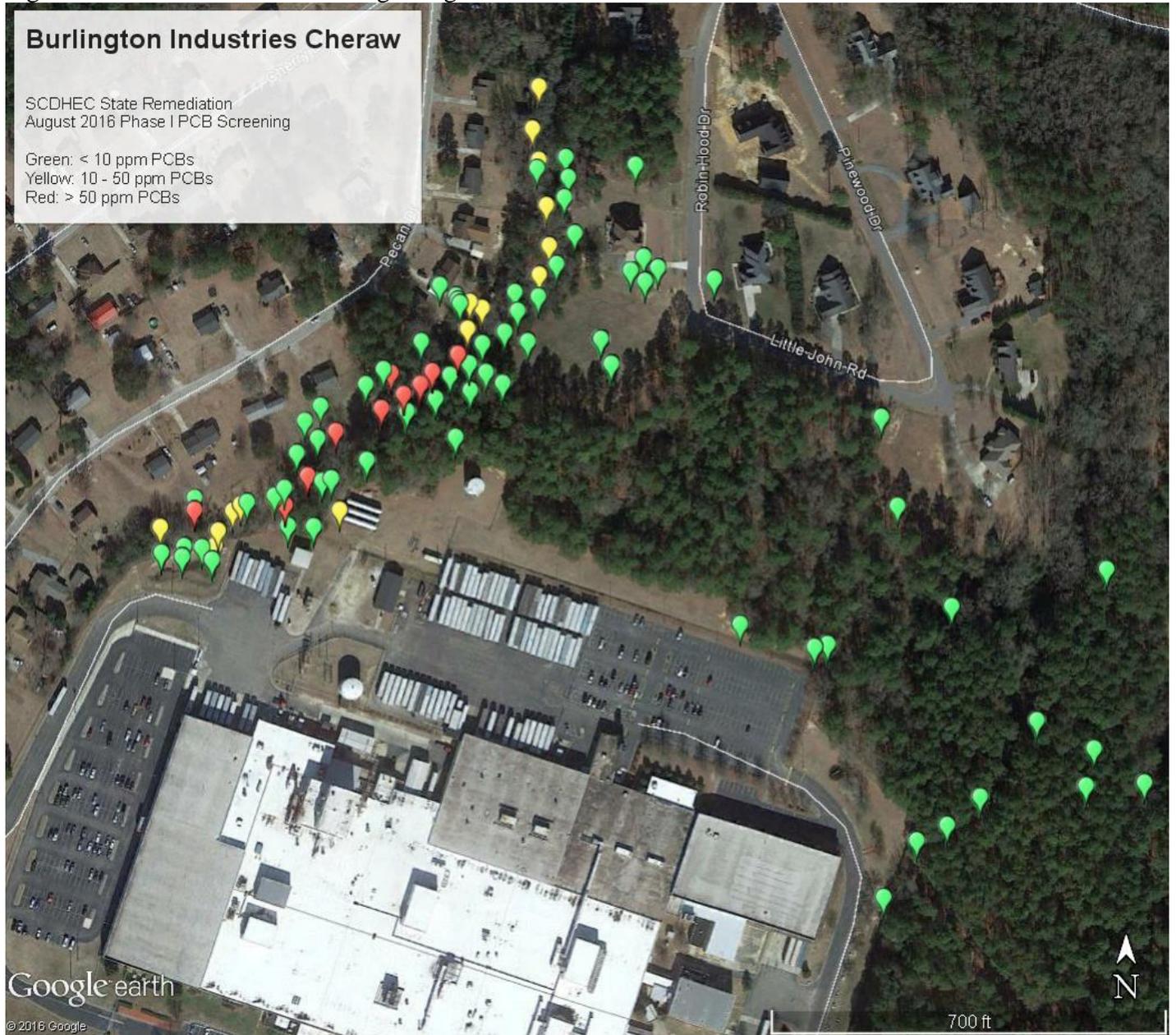


Figure 10: SCDHEC Phase 1 Analysis - August 2016

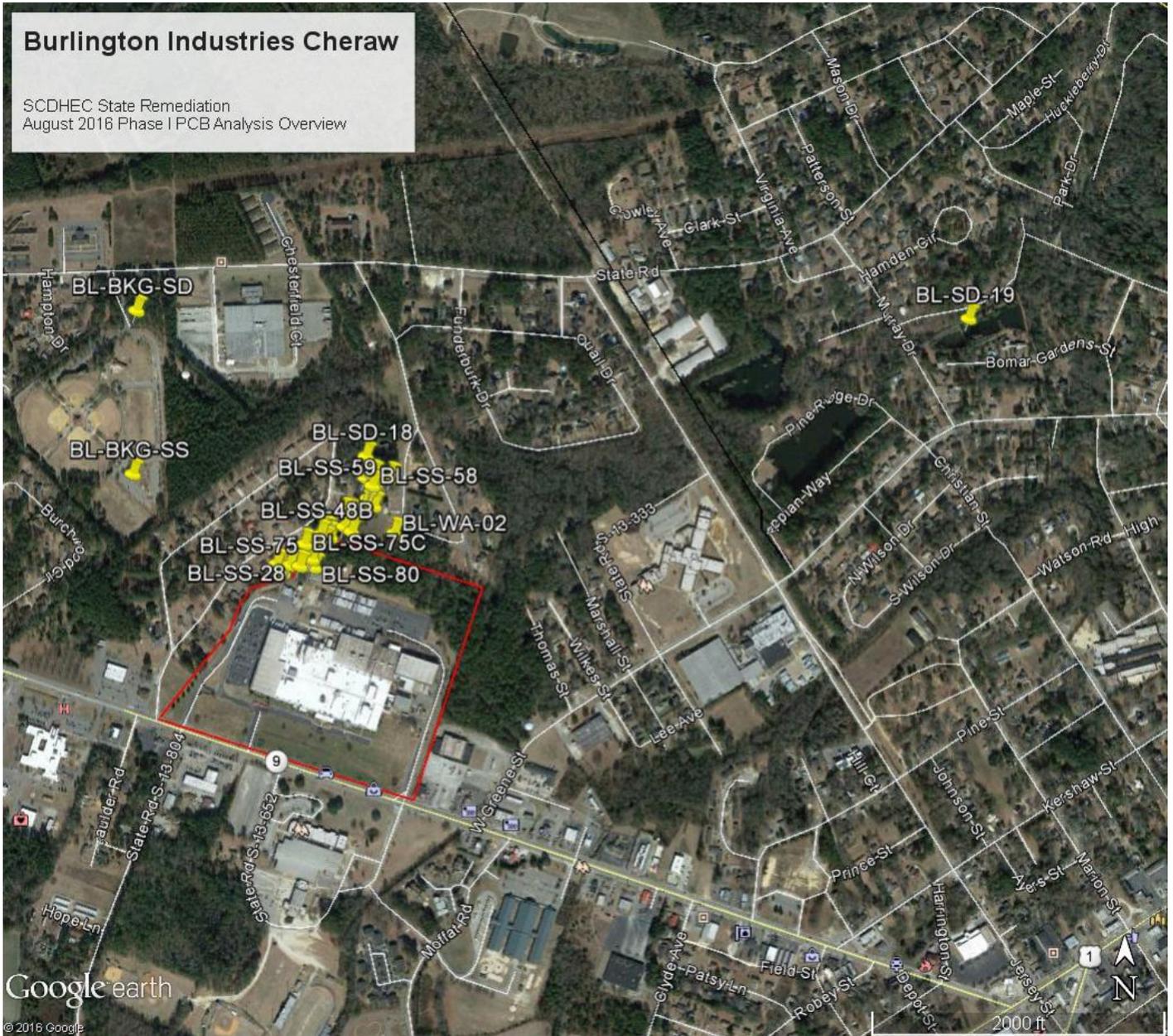
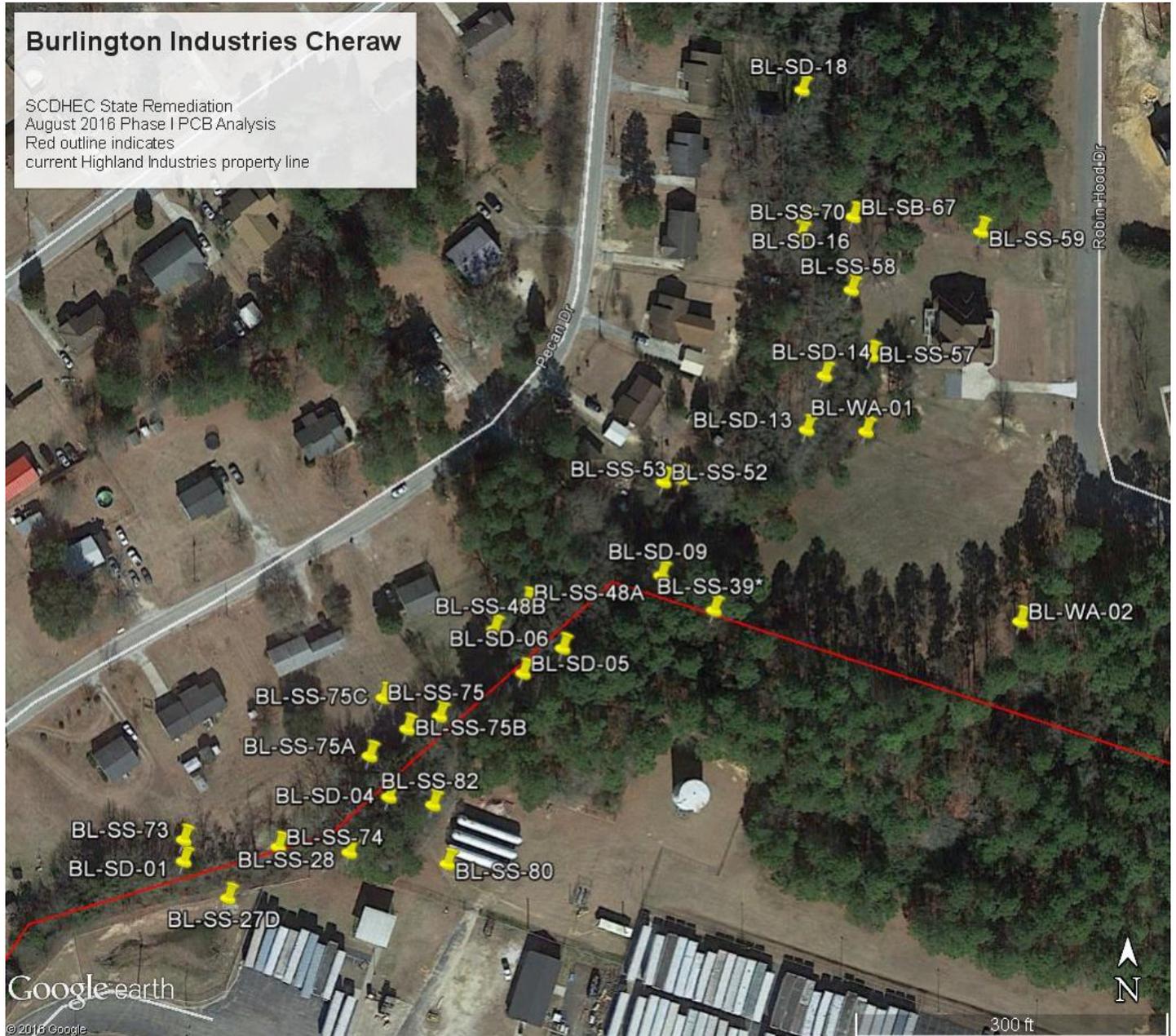


Figure 11: SCDHEC Phase 1 Sampling - August 2016



## **APPENDIX B: SITE COORDINATE COLLECTION**

Site Latitude: 34.695531° N  
Site Longitude: -79.913499° W  
Feature Description: approximate manufacturing facility front door

Collection Date: March 1, 2016

Note: Site Coordinates collected by photo interpretation in Google Earth (estimated accuracy ~20 meters).

**APPENDIX C: ATTACHED REFERENCES**