

**City of Wilmington**  
**Brownfields Assessment Pilot Project Report 2000-02**  
**funded by the U.S. Environmental Protection Agency**

**Prepared for:**

City of Wilmington, North Carolina

**Prepared by:**

Michael Bryan  
Robert Truesdale  
Katherine Heller  
Andrew Stahl

Research Triangle Institute  
Center for Geosciences

**This report was prepared with the cooperation of the  
Local Environmental Action Partnership (LEAP)**



**LEAP Cooperative Partners:**

Cape Fear Community College	NC DENR
CP&L	NC Black Chamber of Commerce
Castle Street Association	NC State Ports Authority
Citizens Community Action Group	N. 4 <sup>th</sup> St. Partnership
City Planning and City Community Development	Northside Clean-up Crew
Community Action Group	Residents of Old Wilmington
Council of Neighborhood Associations	Residents of Excellence
DARE	Sunset Park Neighborhood Association
Friends and Citizens of Wilmington Six	UNCW
Greater Wilmington Chamber of Commerce	Wilmington Community Coalition
Hemenway Neighborhood Association	Committee of 100
New Hanover County Planning Department	Wilmington Regional Association of Realtors

Wilmington City Council passed a Resolution of Support for the LEAP project August 15, 2000

**Wilmington City Council:**

Harper Peterson, Mayor	Laura Padgett
David Jones, Former Mayor	Charles Rivenbark, Former Council Member
Frank Conlon	Sandra Spaulding-Hughes
J.C. Hearn, Former Council Member	James Quinn
Katherine Moore	Jason Thompson

**Prepared for:** City of Wilmington, Development Services Department  
Post Office Box 1810  
Wilmington, North Carolina 28402

**City Project Contact:** Mark Zeigler, AICP, Associate Planner, Planning Division, Development Services Department. (910) 341-5811

**Approved by:** W. Joseph Alexander, P.G., Project Director, Director of Center for Geosciences  
Research Triangle Institute, Research Triangle Park, NC 27709  
Licensed NC Geologist No. 1314

**Table of Contents**

	<b>Page</b>
<b>1.0 Introduction.....</b>	<b>4</b>
<b>2.0 Good Shepherd Ministries.....</b>	<b>5</b>
2.1 History and Current Status	
2.2 Environmental Site Assessment Summary	
2.3 Risk Assessment	
2.4 Remediation Alternatives	
2.5 Redevelopment Planning	
<b>3.0 Soul Saving Station.....</b>	<b>7</b>
3.1 History and Current Status	
3.2 Environmental Site Assessment Summary	
3.3 Risk Assessment	
3.4 Remediation Alternatives	
3.5 Redevelopment Planning	
<b>4.0 Former Icehouse.....</b>	<b>8</b>
4.1 History and Current Status	
4.2 Environmental Site Assessment Summary	
4.3 Risk Assessment	
4.4 Remediation Alternatives	
4.5 Redevelopment Planning	
<b>5.0 Former City Incinerator.....</b>	<b>16</b>
5.1 History and Current Status	
5.2 Environmental Site Assessment Summary	
5.3 Risk Assessment	
5.4 Remediation Alternatives	
5.5 Redevelopment Planning	

5/1/02

## List of Acronyms

COC	Contaminants of Concern
DENR	NC Department of Environment and Natural Resources
EPA	United States Environmental Protection Agency
ESA	Environmental Site Assessment
LEAP	Local Environmental Action Partnership
LUST	Leaking underground storage tank
NC	North Carolina
NC RGs	North Carolina Remediation Goals
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyl
ppm	Parts Per Million
PRG	Preliminary Remediation Goals
PRGi	Preliminary Remediation Goals, industrial
PRGr	Preliminary Remediation Goals, residential
RIMS	Remediation Information Management System
RG	Remediation Goal
RTI	Research Triangle Institute
SVOC	Semivolatile Organic Compound
VOC	Volatile Organic Compound

## Wilmington Brownfields Risk Assessment, Remediation, and Redevelopment Plan

### 1.0 Introduction

The Wilmington Local Environmental Action Partnership (LEAP) project was initiated to create a team of government, civic, neighborhood, and other stakeholder groups to help oversee a U.S. Environmental Protection Agency (EPA) Brownfields Pilot project awarded to the City of Wilmington in 1999. Through this EPA grant, LEAP was able to perform environmental site assessments (ESAs) at several properties in a designated area of downtown Wilmington (see Wilmington LEAP Project Area Map). The City of Wilmington hired RTI to assist them in administering the grant, including conduct of the ESAs.

These assessments are intended to remove barriers created by concerns that environmental contamination may present at a property, complicating its reuse or redevelopment. Assessments help determine if environmental conditions are real or perceived, and when they are real, the assessment is the first step in addressing such conditions in order to improve the local environment and protect human health. LEAP played a critical role in identifying and selecting properties where these assessments would be performed.

Through a series of meetings, community stakeholders suggested potential properties that might benefit from ESAs and helped define a series of criteria to guide the selection of sites to receive these ESAs (see sidebar on following page).

These criteria incorporate priorities, concerns, and visions for the future that were expressed by LEAP members. Based on property owner interest in receiving an ESA to assist their reuse or redevelopment efforts, and compatibility of the property with LEAP criteria, the following properties were selected to receive assessments:



Wilmington LEAP Project Area Map,  
with ESA Property Locations

1. Good Shepherd Ministries property at 9<sup>th</sup> and Martin.
2. Soul Saving Station property at 8<sup>th</sup> and Dawson.
3. Former Independent Icehouse property at 6<sup>th</sup> and Brunswick.
4. Former City Incinerator at 11<sup>th</sup> and Post and Fanning.

Individual environmental assessment reports for each of these properties were delivered to the property owners for their use.

This report addresses the risk assessment, remediation, and redevelopment planning component of Wilmington's LEAP project. Each site is presented independently below.

**Criteria for Selection of Properties to Receive Environmental Site Assessments**

- Real Estate Potential
- Compatibility with Other Initiatives
- Condition of Site Infrastructure
- Location within Project Area
- Owner Participation
- Community Goals and Support
- City Priorities and Initiatives
- Job Creation and Economic Impact
- Redevelopment Potential
- Land-Use/Zoning
- Site Size

## 2.0 Good Shepherd Ministries

### 2.1 History and Current Status

The Good Shepherd Ministries property is a 1.24-acre parcel of land located at the southeastern corner of 9<sup>th</sup> and Martin Streets. This location is within a corridor of downtown Wilmington, north of Greenfield Lake, that contains a number of industrial, manufacturing, and warehousing facilities. Historical business practices at these types of facilities have potential to create



**Good Shepherd Ministries Property (foreground)**

environmental conditions that could complicate reuse or redevelopment of real estate. Due to the location and uncertain history of the Good Shepherd property, the ESA is a valuable tool to investigate whether or not the property may contain environmental conditions that would complicate future use of the property.

The site is currently undeveloped, however the adjacent properties are in use. The property on the western border includes a warehouse-type building, with at least the front portion of the building in use as a clothing retail store (Naz Fashions). The property at the southwestern border is a gas station (LT's Gas Snaks), and the property to the southeast is Greenfield Hairstyling. The property across Martin St. is undeveloped, and the property across 9<sup>th</sup> St. is residential.

A historical review of the property, including interviews with past owners, indicates that the

---

property has never been developed. It was previously owned by a local business man, who had considered developing the property but never did. Prior to this the property was owned by Coastline Railroad.

## **2.2 Environmental Site Assessment Summary**

The Phase I ESA conducted at this Good Shepherd Ministries property revealed no evidence of recognized environmental conditions on the subject property. However, dense vegetation (primarily kudzu) at the site created a limiting condition to conduct of this Phase I ESA, making it impossible to visually inspect the surface of the entire site. Indications of illegal dumping of solid waste (garbage) were found, including tires, concrete and brick debris, bottles and containers, etc.

## **2.3 Risk Assessment**

An adjacent property, a gas station at 815 Greenfield St., was formerly the site of a leaking underground storage tank (LUST). The contamination originating from this site does not appear to impact the Good Shepherd Ministries property, and the leaking tanks were removed and measures were taken to address the contamination caused by the leaking tanks. Because city water is available in this area, any remaining groundwater contamination should not present a difficulty in future uses of the property. However, if basements are to be constructed at the property further evaluation or investigation to assess the unlikely potential for contaminated soil vapor migration from the former LUST site may be prudent.

## **2.4 Remediation**

Because no environmental conditions were identified, no remediation is necessary.

## **2.5 Redevelopment Planning**

Good Shepherd Ministries has extensive and well-articulated redevelopment plans for this property. Good Shepherd Ministries plans to use this property for a 16,600 square foot facility that will include an 84-bed overnight facility for the homeless, a 150-seat dining area, and a 75-seat day shelter. The facility plan is to also house Good Shepherd's Jobs program, Second Helpings program, and medical and mental health facilities. Good Shepherd has thus far received commitments totaling \$1.1 million for this development and is initiating fund raising efforts with a goal of \$2.6 million more to support this project. The City of Wilmington has provided a special use permit to accommodate this development. Architects have been hired and they are progressing through their redevelopment plan. In addition, another property owned by Good Shepherd, located across Martin St. from this one, is being considered for transitional housing to facilitate homeless individuals and families to permanent housing.

As outlined by Good Shepherd Ministries, the reuse plan for this site will provide significant benefit to the people of Wilmington, which in turn supports the desire of LEAP members that the properties receiving environmental site assessments should provide a public benefit to the community. There is a strong fit between the benefits of this reuse plan and the criteria outlined for site selection by LEAP participants at numerous meetings, which lead to the selection of the Good Shepherd Ministries property to receive this environmental site assessment.

### 3.0 Soul Saving Station

#### 3.1 History and Current Status

The Soul Saving Station church property is 0.6-acres located near the intersection of 8<sup>th</sup> and Dawson Streets. It is made up of 12 separate tax parcels on the 800-block of Dawson St. with an alley, Millers Avenue, running parallel to 8<sup>th</sup> St. and separating parcels located on 8<sup>th</sup> St. parcels from those located inside the 800-block of Dawson St. Soul Saving Station is considering options to request that this alley be officially closed, as it is rarely, if ever, used. Of the 12 parcels that make up the Soul Saving Station Property, only 805 Dawson St. has a structure built on it, which is used as the Soul Saving Station Church.



**Soul Saving Station Property**

Dawson Street consists primarily of commercial and residential land uses. Across Dawson Street to the South is the site of the former Jervay housing development. The property on the northeast corner of 8<sup>th</sup> and Dawson is occupied by a restaurant and a religious organization. The remaining properties on this block are either undeveloped or residential.

Because of the downtown location and commercial history of much of this street, the ESA performed for Soul Saving Station was a useful method to investigate the property for environmental conditions that could complicate future use of the property.

Through a review of historical records and interviews with the current property owner, it was learned that the previous use of the current church facility was as a small grocery store. Two of the currently undeveloped lots had previously been sites of a dilapidated house and a 100-year-old church, which was torn down in 1998 or 1999.

There was also once a “junk yard” located on the property. A former tenant had stored junk on this portion of this site, primarily consisting of debris generated by his building demolition business, and that the motivation for the former tenant storing junk on site was to avoid paying county landfill fees. The debris was described as primarily building debris, such as wood, brick, and a great deal of concrete. When the tenant passed away in the early-to-mid 1980s, the

property was condemned. Shortly thereafter a group of volunteers removed the junk from this site by hand and using bulldozers.

### **3.2 Environmental Site Assessment Summary**

The Phase I ESA performed at the Soul Saving Station property revealed no evidence of recognized environmental conditions that would complicate reuse or redevelopment of the property.

### **3.3 Risk Assessment**

Because no environmental conditions were revealed, no human health or environmental risks have been identified associated to this property.

### **3.4 Remediation**

Because no environmental conditions were identified, no remediation is necessary.

### **3.5 Redevelopment Planning**

Soul Saving Station church would like to use this property for a new church facility. The LEAP-provided ESA assists Soul Saving Station's plans by showing that no environmental conditions were identified at the property that could affect their ability to receive loans or other assistance in the redevelopment of the property.

A church facility, serving a primarily minority congregation from the surrounding neighborhood, is a use of the property that is in line with the goals LEAP members outlined as criteria for site selection. Currently Soul Saving Station is at a very preliminary stage in their planning. The LEAP-provided ESA is an important first step.

## **4.0 Former Icehouse**

### **4.1 History and Current Status**

Within the Wilmington community, the property located at the intersection of Brunswick and 6<sup>th</sup> Streets is often referred to as the Wilmington Ice House, because of both its historic use and a prominent inscription near the top of the building that reads "Independent Ice Company". From approximately 1951 to 1986 the property was home to Wilmington Scrap Iron and Metal, but for the last 15 years the property has been inactive.



The current owners, natives of Wilmington currently

---

living out of state, inherited the site from their parents. Individuals interested in purchasing the site have occasionally come forward, but none of their inquiries have resulted in sale or redevelopment of the property.

**Former Independent Icehouse**

The property is approximately 1.35 acres of industrially developed land containing three brick and concrete block buildings that were used for the ice making and scrap metal activities that once took place at the site. The structural and architectural condition of these buildings is not known, but the stability of one of the smaller buildings at the site was of some concern to those conducting recent environmental site assessments. The property is bordered on the south by a railroad right-of-way, and the surrounding properties are all in residential land use.

The owners had a Phase I environmental site assessment performed at the site in 1996, which suggested a likelihood of environmental contamination on the property, most likely as the result of scrap yard operations. Because the Phase I did not go so far as to determine what contaminants are present, in what amounts, and in what parts of the property, the uncertainty surrounding these factors may be contributing to the difficulty the owners have experienced in finding a purchaser for the property.

This property was selected by LEAP to receive a Phase II environmental site assessment for a number of reasons. The site was suggested at several public meetings as one whose redevelopment the community was interested in. Also, the landowner was interested in the benefits of a Phase II offering greater certainty about what environmental conditions are present at the site, which can in turn assist in transactions that may lead to redevelopment of the property.

#### **4.2 Environmental Site Assessment Summary**

The previous Phase I ESA was performed at the icehouse property in 1996. The LEAP resources were used to perform a Phase II ESA based in part on what the Phase I had discovered and partly on a visual inspection of the site. As a scrap yard, the site likely received a variety of waste materials, some of which remain in the buildings on the site. These materials were presumably processed for valuable content and then disposed of. The ground in several areas of the site is scattered with debris, and burned areas suggest that some material was burned onsite.

Samples were taken of soil and groundwater at the property to attempt to learn what types of contaminants may be present, and in what amounts. Because the EPA grant only allowed outside testing, the ESA was focused on environmental conditions (i.e., soil and groundwater); no samples were taken inside the buildings that are located on the property. However, the buildings

do contain old drums, scrap, newspapers, and other materials that will need to be sampled and properly removed before the site can be reused.

To characterize soil contamination, specific areas of concern were identified for surface (approximately the top 6 inches) and subsurface sampling. These areas were delineated based on factors such as discolored soil, areas where plants are not growing well, or evidence that past practices could have created environmental conditions (for example, burning trash or storing chemicals). Subsurface soil samples were taken in areas where deeper contamination was suspected, such as where tanks may have been present. The Phase II ESA Report for the Ice House property provides additional details about the sampling plan and sampling locations.

Although the groundwater is not used in this area of Wilmington, State regulations prefer preservation and remediation of potable (drinkable) groundwater where practicable. For this reason, groundwater samples were obtained from temporary wells installed where deeper soil samples were collected.

Because Wilmington Scrap Iron and Metal could have received and processed a broad variety of contaminated materials, a full suite of chemical analyses were conducted on soil and groundwater samples. The target analyte list was developed to be consistent with North Carolina Department of Environment and Natural Resources (DENR) guidelines for assessment and cleanup<sup>1</sup>, and adequately represents potentially hazardous chemicals that may have been present at the site during the operation of the scrap yard. In all, 161 chemicals were analyzed for in soil including 57 volatile organic compounds (VOCs), 64 semivolatile organic compounds (SVOCs), 19 pesticides, 7 polychlorinated biphenyls (PCBs), and 14 metals. The same list of chemicals was analyzed in groundwater, except for pesticides and PCBs, which were not believed to be significant threats to groundwater quality at the site. Similarly, pesticides and PCBs were not analyzed in soil from some areas of concern because they were not believed likely to be present.

No target chemicals were detected in groundwater above the NC remediation goals, indicating that groundwater quality has not been adversely impacted by activities at the site. Therefore, groundwater quality will not present an impediment to reuse or redevelopment of the property.

Thirty-two of the 161 chemicals were detected in soil at the site, but only 17 of these were above the levels of concern defined for this assessment. Nine of these chemicals were metals, in addition to 4 polycyclic aromatic hydrocarbons (PAHs), 3 pesticides, and 1 PCB. The risk assessment and remediation options for this site focus on these chemicals in soil.

### **4.3 Risk Assessment**

---

<sup>1</sup> Inactive Sites Program Guidelines for Assessment and Cleanup, NC Department of the Environment and Natural Resources (DENR), August 2000.

---

The levels of concern used to screen soil and groundwater contamination include remediation goals defined by DENR and EPA Region 4. A remediation goal is the level of contaminant concentration that may be safely left untreated in soil. In general, this means that chemical concentrations below these levels are safe with respect to human health, i.e., if contaminants are at or below the remediation goal a site may be regarded as clean. Concentrations higher than the goal warrant additional investigation and/or action.

Remediation goals are defined through risk assessment methods that consider how a contaminant may be released to the environment, how it travels or moves through the environment, how people may be exposed, and the health effects that the chemical has on individuals. For groundwater this calculation is straightforward; by considering how much water people drink a day, and the amount of chemical a person may ingest without harmful effects (i.e., the acceptable daily dose), a safe concentration in groundwater is calculated. No chemicals were detected in groundwater, and groundwater remediation goals therefore were not exceeded at this site.

Calculation of risk-based remediation goals in soil is more complicated. People can be exposed to chemicals in soils through several pathways. They can inhale contaminants released by volatilization or through dust. Chemicals can be dissolved by rainwater percolating through soil and contaminate groundwater. Or soil can be directly ingested by children or adults through contact and incidental ingestion. Calculating risk-based levels for soil requires assumptions about the processes and activities that lead to exposure through these pathways.

Table 1 provides the remediation goals that were used to assess the soil concentrations measured during the Ice House Phase II ESA. The table also provides the maximum soil concentrations that were observed for each constituent and the number of areas of concern at the site where the remediation goals were exceeded for a particular contaminant. Only the 17 chemicals that exceed a remediation goal are included in Table 1.

Remediation goals considered in this analysis include the North Carolina Remediation Goals (NC RGs) developed for cleanup of hazardous sites<sup>2</sup> and Preliminary Remediation Goals (PRGs) from EPA Region 9<sup>3</sup> (EPA Region 4 has adopted these goals for their waste site cleanup programs.<sup>4</sup>) The EPA PRGs are based on either residential or industrial landuse assumptions and only consider direct ingestion of soil. The NC RGs consider either soil ingestion or migration to groundwater, using the lower of the two values.

The NC RGs also only consider soil ingestion, but NC reduces the EPA PRGs for toxic, non-carcinogenic chemicals by a factor of five to protect for the possibility that up to five chemicals

---

2 Inactive Sites Program Guidelines for Assessment and Cleanup, NC Department of the Environment and Natural Resources (DENR), August 2000.

3 EPA Region 9 PRG Tables: final list of generic PRG (for soil, air, and water) selected for site screening in Region 9. <http://www.epa.gov/region09/waste/sfund/prg/>

4 <http://www.epa.gov/region4/waste/ots/healthbul.htm>

---

with toxic effects on the same target organ might co-occur in soils at a site. However, these more conservative NC RGs are not applicable to the Ice House site because of the six toxic metals that occur at the site (antimony, cadmium, chromium, copper, nickel, and zinc), only antimony and zinc have effects on the same target organ (hematological), and these two chemicals are not present above concentrations of concern even considering their potentially additive health effects.

The following conclusions can be made from table 1 and knowledge of site conditions.

- The primary chemicals of concern in soil at this site are arsenic, lead, dieldrin, and several PAHs. These chemicals are widespread in the site soils, being present in 5 or more of the 9 areas of concern at the site. They are generally above both the NC RGs and the PRGs considered in this analysis.
- The contaminants currently at the site do not pose a threat to groundwater resources. No contaminants were detected in groundwater above NC RGs, in spite of over 15 years of percolation of rainwater through the soil since the scrap yard ceased operating. Therefore, contaminants currently in the soil do not pose a threat to groundwater quality.
- None of the chemicals at the site exhibit higher risks through dermal (skin) contact than direct ingestion (i.e., direct ingestion EPA PRGs are protective of dermal exposure as well).
- Several chemicals (copper, aldrin, DDT, PCBs) are of possible concern for a few areas of surface soils at the site, but are only of concern for residential development.
- The chromium EPA PRGs are based on the assumption that all chromium in the site's soils is hexavalent, while the most prevalent form is most likely trivalent, which is much less toxic (the PRG for trivalent chromium is 100,000 ppm).

In summary, the primary threat from the chemicals of concern is via the direct ingestion of surface soils, and lead, arsenic, dieldrin, and PAHs are the primary chemicals of concern. Future redevelopment of the site should include measures to prevent exposure through this pathway by minimizing direct contact with soil.

#### **4.4 Remediation Alternatives**

The remediation of this site should focus on the primary contaminants of concern (COCs): arsenic, lead, dieldrin, and the PAHs. There are other contaminants of some concern, especially if there is to be residential (unrestricted) land use, but they generally co-occur with these primary COCs and will be addressed by the actions described below.

With respect to the primary contaminants, several observations may be made about their

---

occurrence at the site.

- These contaminants are consistent with the scrap yard operation, where old pesticides and lead batteries may have been received and processed.
- The widespread lead contamination and its co-occurrence with elevated levels of cadmium and zinc suggest that battery breaking and recycling was part of scrapyards operations. Across the 6 areas of concern with lead levels of concern, lead concentrations range from 3.3 to 20 times the residential PRG (400 ppm) and from 1.7 to 11 times the industrial PRG (75 ppm).
- The PAHs are most likely combustion residues or from used oil, tar, or creosote. Although they do occur above PRGs at depth (up to 7 feet), these deeper pockets of contamination do not pose a threat to groundwater and are not likely to be available for direct contact unless there is excavation and redistribution of soil at the site. However concentrations in surface soil are of concern, with the highest average soil concentrations (8.8 ppm) for benzo(a)pyrene being over 100 times the residential PRG (0.062 ppm) and to 31 times the industrial PRG (0.29 ppm).

RTI did a search of the Remedial Information Management System database for applicable remediation technologies, but did not find innovative technologies that could treat all of the primary contaminants. For example, phytoremediation, using plants that absorb metals, could be effective for lead, but probably would not help remediate dieldrin, arsenic, and the PAHs. Given the contaminants of concern and the size of the site, two more conventional approaches are suggested for cleanup of soils.

- Excavation and disposal of hazardous surface soils in an offsite landfill
- Covering of contaminated soils to prevent contact (by paving or bringing in clean soil), followed by non-residential development.

The first approach has the advantage of permanently addressing the contamination and allowing unrestricted development, but could be costly. Assuming that the site is about 1.3 acres, that the area under the buildings would not be cleaned up, and that the excavated soil would not require treatment or stabilization prior to disposal, landfill disposal costs alone could range up to \$350,000 if all of the soil not under buildings is excavated to a depth of one foot and sent to a hazardous waste landfill. If one-half of the soil must be removed, disposal costs would be \$175,000. Loading and transport add about \$20,000 to \$40,000.<sup>5</sup> Excavation costs are more uncertain because there is concrete over significant portions of the site. However careful excavation and testing of soil as it is excavated could help to minimize the amount of soil that would need to be disposed. A portable x-ray fluorescence unit could be very valuable for

---

<sup>5</sup> Based on *Unit Costs for Remediation*, R. S. Means (1999).

measuring lead concentrations as the soil is being excavated so that clean soil is not sent for landfill disposal, and would provide reliable measurements if combined with confirmatory laboratory analysis for lead and the other constituents of concern.

The second approach could be appropriate for nonresidential use such as a senior center or museum (see the following section 4.5 Redevelopment Planning for additional information). Pavement, or a permanent soil cover could be used to cover the contamination in place and thereby prevent direct contact with (and incidental ingestion of) soil. However, covering and leaving all or some of the contamination in place would need to be negotiated with the NC DENR, either through the voluntary cleanup program (if the site is to be cleaned up by the owner) or through the brownfields program (if the site is to be cleaned up by the prospective developer and will provide a public benefit). It would seem that the planned uses for Ice House property are well suited for entry into the NC Brownfields program. The high levels of contamination with respect to PRGs could pose an obstacle to leaving all of the contamination in place. In the words of NC DENR in their September 2000 “Brownfields Program Guidelines and Issue Resolutions”:

“Some properties, however, may contain highly contaminated areas that redevelopment plan controls may eliminate as risks to people, but may not eliminate as significant risks to the environment or to the long term safety of the redevelopment. Although a redevelopment design may eliminate these areas as risks to people using the property, such areas . . . reduce the margin of safety provided by the redevelopment design, or may jeopardize the permanence of the agreement. As an example, some properties may . . . contain pockets of highly contaminated soils. As another, the public and the Department may feel comfortable when a four-inch thick asphalt parking lot covers soil contaminated at three times unrestricted use standards, but may feel much less comfortable if there are hot spots in the area significantly more contaminated, even though the redevelopment design indicates both areas would be made safe. Remediation of highly contaminated areas will decrease the likelihood that the Agreement will be reopened in the future due to an increased calculated risk, and will reduce the chance of third-party lawsuits. In sum, the Department believes that it is in the best interest of the public to clean up these highly contaminated areas whenever practical and intends to specify those areas to be cleaned up in the Brownfields Agreements.”

Thus it is possible that some soil contamination at the Ice House property could be left in place, while other “hot spots” would have to be cleaned up. A careful sampling approach, utilizing field measurement methods such as x-ray fluorescence to identify such hotspots, could lead to a practicable, effective, and safe cleanup and redevelopment plan for this site.

#### **4.5 Redevelopment Planning**

The owner<sup>6</sup> of the former Independent Icehouse property inherited the property from his parents, who operated a scrap metal and paper recycling business at the site until the 1980s. He is a Wilmington native who is interested in a reuse or redevelopment plan for the site that will be acceptable to the neighbors surrounding the property. Working toward this goal, he arranged a meeting in August 2001 with City of Wilmington Community Development and Planning staff, as well as members of local community housing development organizations, some of which are also associated with local churches.

At this meeting, several attendees expressed interest in the possibility of preserving the icehouse structure because of its historic significance. The city historic preservation planner suggested it is potentially eligible for local landmark designation. The owner indicated that the building's cornerstone is marked 1898, a significant year in Wilmington's history because of the well known race riots that occurred that year.

Three primary redevelopment scenarios were discussed: a museum/gallery, possibly devoted in part to the riots; a senior center, possibly in conjunction with senior housing that could incorporate a vacant property adjacent to the icehouse; and low-to-moderate income housing.

The museum and senior-focused options both received positive reactions, while the low-to-moderate income housing scenario was strongly opposed. The case against the housing option was based on strong neighborhood opposition to a recent proposal by a developer to build such housing in a nearby location. Residents also expressed a strong interest in a playground for younger children.

Senior-focused reuse options were popular because of the number of aging residents who would like to remain in the neighborhood, near their friends, families, churches, and in generally familiar surroundings. There is public housing nearby in which some aging residents have difficulty with the stairs and aging heating and cooling systems. There is currently no such facility for the aging located near this neighborhood. Housing for people with special needs was also mentioned, along a similar theme to the senior housing.

The property owner has expressed a desire to continue to work with the neighbors living around the property to learn more about their issues, interests, and concerns, as well as with the city. To this end, he attended a LEAP public meeting in November 2001 where the Icehouse site was discussed. Neighborhood residents were in attendance, and indicated they would like to continue to be involved as the project takes shape. A cautionary note was sounded by several attendees, who expressed concern that hopes not be raised too high at such an early stage of the project. They indicated that they have experienced other projects that either do not materialize or do not result in the outcomes that had been promised.

---

<sup>6</sup> "Owner" refers to the property's point-of-contact, who is managing the joint inheritance for himself and his sister.

Several attendees expressed an interest in retaining the character of the residential neighborhood, and indicated that they would not like to see commercial land use at the site. Transportation issues, particularly related to the dead-end of 8<sup>th</sup> Street, were also discussed. Attendees were generally supportive of the senior citizen-oriented suggestions. Because the County is responsible for most senior citizen services, it was suggested that the dialogue should be opened with the county soon to determine their interests.

## **5.0 Former City Incinerator**

### **5.1 Current Status**

This is a 2.19-acre property owned by the City of Wilmington and located between North 10<sup>th</sup> and 11<sup>th</sup> Streets and Post and Fanning Streets. The site was once the location of a city-owned

solid waste incinerator, possibly until the early 1970's. It is currently an undeveloped grassy lot. Across North 10<sup>th</sup> street to the west is a City of Wilmington municipal garage, and there are residential houses located around the property.



**Former City Incinerator Property**

Environmental site assessments were performed at this property in 1994. The results indicated metal contaminants at the site in concentrations above remediation goals established by NC DENR. Interest in this property was voiced during an early LEAP public meeting, as some area residents remembered an earlier attempt to develop affordable or low-income housing on this site.

While no party came forward with a specific interest in redeveloping this property, many local residents raised this property in public meetings. As a result of this interest, LEAP decided to conduct a review of earlier environmental assessments at the site. This review was conducted to investigate how environmental conditions might impact future use of the property, should an interested party or reuse option present itself.

### **5.2 Environmental Record Review Summary**

The environmental site assessments that were performed at this property in 1994 indicated that there were several compounds in the subsurface soil (approximately 2 feet below the surface) in concentrations above NC DENR's remediation goals. The contaminants that exceed the remediation goals included three metals: lead, chromium, and arsenic. There is no indication in the ESAs that surface soils are contaminated, but it is also not clear how the surface soils were sampled as part of the ESA effort. In addition, analyses did not include the broad list of

contaminants that may be required under the NC Inactive Hazardous Sites Program.

### **5.3 Risk Assessment**

The contaminants known to be present at the site above NC Remediation Goals (NC RGs) include arsenic, chromium, and lead. At 36 ppm, chromium is only slightly above the NC RG for residential use (30 ppm) and is not above the EPA PRG for industrial use (64 ppm). Given that remediation goal assumes that chromium is in the hexavalent form, and that it is most likely that most of the chromium in the subsurface is trivalent, there is probably no concern for this contaminant.

Arsenic is present at concentrations up to 5 times the NC RG of 4.4 ppm. This poses some concern if the contaminant is available for direct contact and incidental ingestion, but given that the sample was obtained beneath the surface, there is no concern if the contaminated soils are not excavated. Similarly, lead is present at about four times the NC PRG, but does not pose a direct contact threat if it remains in the subsurface. Also, the highest lead concentration (1,700 ppm) is still below the 2,000 ppm mandatory action level set for residential soil by the Department of Housing and Urban Development under Title X.

### **5.4 Remediation**

The information available is not adequate to properly assess or address remediation options at this time. Although, the available information suggest that contamination is above PRGs in some areas in the subsurface, it is not clear whether surface soils are contaminated or if the underlying groundwater has been contaminated. However, assuming that the Phase 1 ESAs were focused on the “worst” areas of contamination, the levels detected could be amenable to leaving the contamination in place if the development planned is industrial or otherwise non-residential. However, preparing the land for unrestricted use could require some cleanup.

### **5.5 Redevelopment Planning**

In the early 1990’s the Wilmington Housing Finance Development Office expressed interest in constructing single-family owner-occupied housing on this site. The City staff contacts for this project are no longer working for the City of Wilmington, and as a result it was unclear what factors may have contributed to keeping this plan from being realized.

At LEAP public meetings the former city incinerator site was suggested as a potential brownfield site that the neighbors surrounding the property have significant interest in. One attendee expressed interest in using the site for a job training facility, while another suggested the potential for some type of park or recreational area.

Presently the City does not have definite reuse plans for this property. The future of nearby

---

property, however, which is presently used as a storage lot for city maintenance vehicles, is being considered for affordable housing. The former city incinerator property, therefore, could be considered as an affordable housing site or neighborhood park in the future. However, the City Parks Department indicated that they have a priority and ranking list of proposed city park sites already under consideration and this property ranks low. Unless or until a clear reuse or redevelopment option is proposed for this property, it is anticipated that the City will leave the property intact as an undeveloped mowed grassy lot.

**Table 1. Summary of Soil Contamination above Remediation Goals:  
Wilmington Ice House Site**

Chemicals of concern	Remediation Goals - ppm		Maximum Soil Concentration- ppm (Max/PRG; Max/PRGi)	Number of AOCs Above Remediation Goals			Comment	
	NC RG	PRG		PRGi	>NC RG	>PRG		>PRGi
<b>Metals</b>								
Antimony	6.2	31	820	6.3 (0.2; 0.01)	na <sup>1</sup>	0	0	NC RG not applicable <sup>1</sup> ; no values exceed residential or industrial PRGs for ingestion
Arsenic	4.4	0.39	2.7	33.6 (86; 12)	5	8	5	Widespread, surface soil contamination above residential and industrial PRG and NC RG
Cadmium	7.4	37	810	34 (0.92; 0.04)	na <sup>1</sup>	0	0	NC RG not applicable <sup>1</sup> ; no values exceed residential or industrial PRGs for ingestion
Chromium	30	30	64	230 (7.7; 3.6)	7	7	5	Concentrations (42–230 ppm) are of concern only if it is assumed that 100% of Cr is in the toxic hexavalent form; most of the chromium at the site is probably in the nontoxic trivalent form.
Copper	580	2,900	76,000	6,100 (2.1; 0.08)	na <sup>1</sup>	1	0	NC RG not applicable <sup>1</sup> ; one value exceeds PRG for residential ingestion, could be a wire fragment
Lead	400	400	750	8,100 (20; 11)	6	6	6	Widespread, surface soil contamination above residential and industrial PRGs. Presence with zinc and cadmium suggests battery breaking and recovery.
Mercury	4.6	23	610	5.0 (0.22; 0.01)	na <sup>1</sup>	0	0	NC RG not applicable <sup>1</sup> ; no values exceed residential or industrial PRGs for ingestion
Nickel	320	1,600	41,000	720 (0.45; 0.05)	na <sup>1</sup>	0	0	NC RG not applicable <sup>1</sup> ; no values exceed residential or industrial PRGs for ingestion
Zinc	4,600	23,000	100,000	12,000 (0.52; 0.12)	na <sup>1</sup>	0	0	NC RG not applicable <sup>1</sup> ; no values exceed residential or industrial PRGs for ingestion

Risk Assessment, Remediation, and Redevelopment Report

<b>Pesticides and PCBs</b>									
Aldrin	0.029	0.029	0.15	0.054 (1.86; 0.36)	1	1	0	0	One value (0.054) slightly exceeds NC RG and EPA PRGr
DDT	1.7	1.7	12	6.3 (3.72; 0.53)	1	1	0	0	Single value (6.3 ppm) of concern for residential land use only
Dieldrin	0.03	0.03	0.15	0.74 (25; 4.9)	5	5	4	4	Fairly widespread, surface soil contamination above residential and industrial PRGs
PCBs	1	0.22	1	3.79 (17;3.8)	1	1	1	1	One value (3.79) exceeds residential and industrial PRGs
<b>Polycyclic Aromatic Hydrocarbons (PAHs)</b>									
Benz[a]anthracene	0.62	0.62	2.9	6.89 (11, 2.4)	5	5	3	3	Fairly widespread surface and subsurface soil contamination above residential and industrial PRGs. PAHs could be combustion residues, waste oils, tar from scrap yard operations. Levels of concern occur at depth (up to 7 feet).
Benzo[b]fluoranthene	0.62	0.62	2.9	30.1 (49; 10)	6	6	5	5	
Benzo[a]pyrene	0.062	0.062	0.29	8.88 (143; 31)	5	5	5	5	
Indeno[1,2,3-cd]pyrene	0.62	0.62	2.9	4.79 (7.7; 1.7)	3	3	2	2	

Shaded rows indicate contaminants of primary concern.

<sup>1</sup> NC Remediation Goal is residential PRG/5, which assumes that 5 chemicals are present in soil with toxic effects on the same organ. This does not occur at the Ice House site, so the NC RG is not applicable and the PRGr is the appropriate remediation goal for unrestricted use.

ppm = parts per million

NC RD: North Carolina Default Soil Remediation Goal (August 2001)

PRGr: EPA Region 9 / Region 4 preliminary remediation goal, residential landuse (November 2001)

PRGi: EPA Region 9 / Region 4 preliminary remediation goal, industrial landuse (November 2001)

GW: groundwater; AOC: area of concern; PCB: polychlorinated biphenyls