

Abstract

Since the mid-1980s, environmental site investigations have been used to minimize environmental liability associated with real property transfers. One of the most important elements of these investigations is land use history research. Although these investigations have primarily been used to delineate potential soil and surface and ground water contamination for commercial and industrial real property, standard historical sources used in this process can also be used to identify environmental problems at Brownfield sites. This paper describes how to conduct land use history research, provides recommendations for communicating the findings, and suggests that land use history research may be useful in providing baseline information about Brownfield sites. It also addresses the issue of standardizing the environmental site assessment process and recent regulatory changes regarding Brownfield site assessments and the EPA's definition of "all appropriate inquiry."

Brownfields Site Assessments: The Site History Imperative

Dale A. Stirling

Intertox, Inc., Seattle WA

Introduction

Identifying, characterizing, and communicating contaminated land hazards are a challenging task for government agencies and environmental and public health consultants. For instance, the Agency for Toxic Substances & Disease Registry (ATSDR) is required to conduct public health assessments for sites appearing on the U.S. EPA's National Priority List (Superfund). In addition, the ATSDR may also conduct petitioned health assessments. State, regional and county health departments and districts often conduct similar studies as well. In the private sector, consultants perform Phase I Environmental Site Assessments (ESA) for a wide variety of public and private clients in order to minimize their liability for contaminated site clean up costs. Unfortunately, most environmental site investigations fall short in one crucial area--delineating potential threats to human health is rarely based on a thorough understanding of *historical uses* of a property and its immediately surrounding area. In recent years the ESA process has also become a regular feature in Brownfields site assessments. Therefore a similar lack of understanding of past site use research of Brownfields has become apparent.

The Interface of ESAs and Brownfields

According to the U.S. EPA a site is a "Brownfield" if its expansion, redevelopment, or reuse may be complicated by the presence or potential presence of hazardous substances, pollutants, or contaminants.¹ The genesis of the Brownfields movement in the US can be traced to 1995 when

¹ U.S. EPA. 2003. Brownfields glossary of terms. Available online at <http://www.epa.gov/swerosps/bf/glossary.htm#brow>.

EPA administrator Carol Browner announced the “Brownfields Action Agenda” which was designed to “help reverse the spiral of unaddressed contamination, while maintaining deterrents to future contamination and EPA’s focus on assessing and cleaning up ‘worst sites first’.”² Over the past eight years the EPA has advanced the Brownfields agenda by funding pilot programs to public agencies for the identification, cleanup, and redevelopments of Brownfields sites and promulgating policies intended to clarify liability and cleanup issues.³ Since 1995, the use of environmental assessments in the Brownfields process has gained prominence. For instance, in its 1998 *Quality Assurance Guidance for Conducting Brownfields Site Assessments*, the EPA states that “frequently, the first step is to conduct a site background or historical investigation to identify past uses of the property, including types and amounts of chemicals that may have been used onsite and waste generation and disposal activities that may have contributed to contamination.”⁴ The EPA also first mentioned the ASTM E1527-97 Phase I ESA standard. Also in 1998 the EPA issued the quick reference fact sheet *Targeted Brownfields Assessments* (EPA/500/F-98/251) which described funding available for brownfields contaminated or suspected to be contaminated with hazardous substances (excepting sites contaminated only with petroleum products). Early uses of this funding included a contaminated site on the banks of the Penobscot River in Old Town, Maine and a former metal fabrication plant in Smithville, Texas. However, it wasn’t until the EPA’s 2001 *Technical Approaches to Characterizing and Cleaning up Brownfields Sites* that the agency provides a Phase I ESA imperative—the EPA devotes an

² U.S. EPA. 1997. The Brownfields Action Agenda.

³ Hernandez J.L. and Reilly K.B. 1998. A practical guide to brownfields transactions. *Practical Real Estate Lawyer*, 14(4): 9-26.

⁴ U.S. EPA. 2001. *Quality Assurance Guidance for Conducting Brownfields Site Assessments* (EPA/5405R-98/038). Washington, D.C.: Office of Solid Waste & Emergency Response.

entire chapter to the phased environmental site assessment process. It states that “the purpose of a Phase I site assessment is to identify the type, quantity, and extent of possible contamination at a brownfields site.”⁵ More importantly, it notes that “the elements of a site assessment presented here are based in part on ASTM Standards 1527 and 1528.”

The Imperative for Brownfields Site History

On January 24, 2003, the EPA published in the *Federal Register*⁶ a direct final rule that clarifies the Small Business Liability Relief & Brownfields Act. For the first time, brownfields owners may use the current ASTM E1527-2000 and its processor ASTM E1527-1997 for conducting all appropriate inquiry into past activities on a Brownfield in order to establish the innocent landowner defense allowed for under CERCLA for properties purchased after May 31, 1997. More specifically “until the agency promulgates regulations implementing standards for all appropriate inquiry, parties may use either the procedures provided in ASTM E1527-2000...or the standard ASTM E1527-1997.”⁷ It is unknown at this time how the EPA will define what the “all appropriate inquiry” standard will be. However, it seems likely that by January 2004, when new regulations must be enacted, the EPA’s standard will share striking similarities to the existing ASTM standard. In response to the direct final rule seven comments were submitted to the EPA. There was general support for EPA’s commitment to the ASTM standard as an interim standard. However, one commenter was concerned about lack of acknowledgement of the

⁵ *ibid*

⁶ U.S. EPA. 2003. Clarification to Interim Standards and Practices for All Appropriate Inquiry under CERCLA and Notice of Future Rulemaking Action. *Federal Register* (Vol. 68 No. 16, pages 3430-3435).

⁷ *ibid*

importance of historical research resources⁸ and another stated that standards of site assessments should be determined by the states⁹. One commenter, the Ohio Department of Transportation, suggested that its own environmental site assessment guidelines be considered by the EPA as meeting “all appropriate inquiry” under CERCLA.

The Site History Process

A comprehensive overview of past uses of a Brownfield and its improvements will assist in determining the source, extent, and existence of hazardous substances and materials of potential concern in the soil, surface water, groundwater, sediment, and air that may impact public health.

A thorough Brownfields site history should accomplish the following:¹⁰

- Characterizes known activity on a property from its undeveloped state to the present
- Identifies historic and contemporary activities that may have generated hazardous substances and materials
- Identifies potential hazardous substances and materials released to environmental media (soil, groundwater, surface water, air)

An important first step in the site history process is the identification of a site’s actual street address and physical location of the Brownfield. This information is readily available from several sources, including city directories (R.L. Polk is the chief publishers of such reference works), real estate atlases, title companies, and county assessor offices. The following data

⁸ Stirling D.A. 2003. Letter dated February 12 to USEPA Docket Center, Docket ID No. SFUND-2002-0007.

⁹ Ellis M. 2003. Electronic comments dated February 13 submitted to USEPA Docket Center, Docket ID No. SFUND-2002-0007.

sources are useful in characterizing historic and contemporary uses of Brownfields. They are presented in relative order of importance and based on highest return of information versus cost of acquisition.¹¹

Aerial Photographs

Compiling a set of photography taken over a period of several decades will evidence land use changes in dramatic fashion. Aerial photography is available from many federal, state, regional, county, and city agencies. The most common sources are the U.S. Agricultural Stabilization & Conservation Service, Geological Survey, and Natural Resource Conservation Service (formerly the Soil Conservation Service); State natural resources and transportation departments; and regional, county, and city planning agencies (the oldest commonly available photography dates to the 1920s). In addition, numerous commercial aerial photography studios have large stocks of historic photography. However, their rates are high compared to government agencies for the reason that much of their stock was purchased from agencies.

Maps

Maps represent a treasure trove of land use information. The following types of maps are appropriate to consult when researching land use histories. Topographic maps are useful because they show structures, buildings, utility corridors, and transportation routes. The USGS has published topographic maps of every state and many maps date to the 1880s. These maps are usually available at public and university libraries. In addition, historic topographic maps can be

¹⁰ Stirling D.A. 1990. Site histories in environmental site assessments: a new opportunity for public historians. *The Public Historian* 12(2): 45-52/

purchased from the USGS on microfiche, microfilm, and CD-ROM. Also, some topographic maps can be viewed on the Internet. Other federal agencies with topographic mapping functions include the Bureau of Land Management, Forest Service, Fish & Wildlife Service, and National Park Service. State, regional, county and even city agencies often produce topographic maps.

Atlases

Unlike topographic maps, atlases are usually bound maps that feature non-physical related information such as named and numbered streets, lot and plat numbers, and so on. There are a variety of atlases useful for delineating a property's history over time. The most valuable are fire insurance maps published by several mapmakers between the 1850s and 1930s. Chief among these is the Sanborn Map Company (currently in business in Pelham, NY). Fire insurance maps were prepared in order to set fire insurance rates, therefore building construction materials were very important, and surveyors for the company would note whether or not a building or structure contained asbestos, thus paying lower rates. But in addition to asbestos, the maps would show in great detail street address, physical layout, and precisely how the building or structure was utilized. The original hand colored maps are in the Library of Congress; however, print outs of these maps can be acquired from several commercial sources. When compiled for a period of years in a specific city, exacting information about a property's land use over time can be delineated. Other useful atlases include those published for real estate and platting purposes. The best-known real estate atlas makers are the Kroll and Metsker map companies. They published numerous atlases for many major American cities between the turn of the century and the 1960s

¹¹ Stirling D.A.2002. Minimising environmental liability using historical research: a US perspective. *Environmental Liability* 10(3): 119-126.

on an almost yearly basis. Although not as detailed as Sanborn maps, they are useful, especially to identify land uses in years that Sanborn maps were not published.

Building Permits and Plans

Important sources of site history information are the building permits and plans required by most county and city building departments. These records are accurate and time dated. Information may include details about construction materials, subsurface improvements, and installation of objects or sources of environmental contaminants. Reviewing such records for a property over time provides clear detail about land uses.

Land Use and Zoning Records

Documenting land uses and how specific land can be used are the function of county and city land use and zoning departments. These records not only identify property locations, but also included information on allowed uses over time. These departments often have historical records of importance including maps, plats, atlases, aerial photographs, and documentary reports.

Federal, State and Local Environmental & Health Agency Records

Another important source of property use information can be found in the records of environmental and health agencies. These records are created because of regulatory requirements and may include inspection reports, permits, notices of violations, listings of confirmed and suspected contaminated sites, maps, and photographs. In some cases Freedom of Information Requests must be filed to review such records.

City Directories

Published since the 1880s, these directories exist for most major cities in the U.S. The primary publisher is the R.L. Polk Company and its directories can be found in nearly every public library. When researched over time for a specific address they provide accurate information about who has occupied a property.

Title Searches and Documents

A thorough search for all recorded title instruments for a property for a period of 50-100 years may be useful in identifying past uses. Some title companies provided these as "property title history reports," and included copies of recorded deeds, leases, and easements. Often, these documents will include information about land uses, such as land filling, underground storage tanks, or chemical stores.

Textual and Archival Records

Written materials are also useful in re-creating land use over time and when supplemented with graphical material provide a comprehensive overview. Textual records of value include books, monographs, dissertations, theses, newspapers, and periodicals related to local history. Non history related textual material that can assist in identifying past property uses include those related to industrial technology, geography, and natural resources. These records are available in many federal, state, local, and university libraries and special collections. If budgets and scope allow, archival records (including manuscripts) may include land use information. Archival records consist of those records generated by an institutions, agency, or organization and maintained by that entity. Manuscripts consist of business and personal records collected by

museums, libraries, archives, and historical societies. For site history purposes, business records will be the most useful because they may contain information about operations and property uses.

Books of Interest

Even the most knowledgeable site assessor cannot know all possible waste streams of historical significance associated with business and industry. Therefore, the following books are useful references. The *Handbook of American Business History, Volume 1, Manufacturing: A Historiographical and Bibliographical Guide* provides a concise historical snapshot of key American industries (i.e., food, tobacco, textiles, lumber, chemicals and drugs, petroleum, leather, furnaces, machinery, electrical equipment, transportation equipment, scientific and photographic instruments, and musical instruments, toys, and sporting goods). A similar book of value is Douglass Brownstone's *A Field Guide to America's History* (Facts on File, 1984) which provides historical snapshot of American landforms and uses. Each discussion includes a short narrative history followed by a paragraph on "range" which is the geographical locale of the land form, followed by "where to look" which provides advice as to where these land forms are typically found. He divides the book in to five parts: the land talks, footprints across America, the builder's legacy, a nation of farmers, and a harvest of common artifacts. Chris Shindeldecker's *Handbook of Environmental Contaminants: A Guide for Site Assessment* (Lewis Publishers, 1992) provides a comprehensive list of chemicals commonly found during the Phase I ESA process and includes general types of materials associated with specific chemicals as well as raw materials, intermediate products, final products, and waste products generated during manufacture and use of each specific chemical. For assessments of industrial properties an

essential reference is the National Fire Protection Association's *Industrial Fire Hazards Handbook* (any edition) which examines specific activities associated with more than 45 key American industries and the expected hazards associated with that industry. For those sites where the nature of industrial or commercial activity is unclear the Office of Management & Budget of the Executive Office of the President has published the *North American Industry Classification System* book. It is the single best resource for understanding what activities occur in American industry. Although it does not provide hazardous waste information, it is a valuable reference for those seeking to characterize former site uses.¹²

Purchasing Site History Information

All of the site history material previously mentioned is readily available to the environmental site assessor; however, there are several national companies that specialize in doing such research. Each offers benefits and disadvantages. By and large, the companies purchase regulatory databases from federal, state, and local agencies and from those, provided lists of contaminated sites adjacent to, or even, including the subject site. Those sites of concern are shown on maps. These easy to read and affordable reports may save time and money. However, some companies provide site history research services using low paid researchers to sift through historical documents. But, such search and retrieval can be accomplished by any one with research experience and the liability may be too high to rely on another's research skills.

¹² Litt J.S. and Burke T.A. 2002. Uncovering the historic environmental hazards of urban brownfields. *Journal of Urban Health* 79: 464-481.

Evolution of Environmental Site Assessment Standards

A number of professional organizations have developed environmental site investigations standards and guidelines. In 1989, the Association of Engineering Firms Practicing in the Geosciences (ASFE) became the first organization to analyze the growing environmental site assessment market in *Preacquisition Site Assessments: Recommended Management Procedures for Consulting Engineering Firms*. In 1994, ASFE published a *Model Phase I Environmental Site Assessment Report for Compliance with ASTM E 1527-93*. All other standard setting organizations have followed the lead taken by the ASFE. In 1990, ASTM, one of the best known standard setting organizations in the world, began the process of developing what would become the future accepted standard process for conducting environmental site assessments in the U.S. After extensive draft reviews, ASTM published the first standard, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process (E 1527-93)* in 1993. Subsequent revised versions were published in 1994, 1997, and 2000. A more streamlined standard, *Standard Practice for Environmental Site Assessments: Transaction Screen Process*, was also first published in 1993 and subsequently revised in 1994, 1997, and 2000.

In 1992, the Association of Groundwater Scientists & Engineers (AGWSE) published the *Guidance to Environmental Site Assessments*. Its guidelines were based on property types (vacant land, agricultural land, commercial land with improvements, and industrial land). Also in 1992, the Consulting Engineers Council of Metropolitan Washington published *Environmental Site Assessments: Guidance for Users and Providers—The Mid Atlantic Standard of Care*. The Environmental Assessment Association (EAA) began providing a certification in

environmental site assessment in the early 1990s and published several corresponding guidelines. The last major U.S. organization to develop environmental site assessment guidance was the American Society of Civil Engineers, which published *ASCE Manuals & Reports on Engineering Practice No. 83: Environmental Site Investigation Manual* in 1996. This document also offers guidance for conducting Phase II and Phase III environmental site assessments.

The U.S. Environmental Protection Agency (EPA) is the leading federal agency with the power to regulate and develop environmental policy. However, since the mid 1980s it has published only one significant ESA related document.¹³ In 1989 two leading consulting firms were contracted by the EPA to study current ESA practices. The resulting study examined practices of three federal agencies (USDOD, USDA, and USDOJ), relevant laws and regulations; and measures being implemented by public and private corporations and institutions to minimize liability under the Superfund Amendments & Reauthorization Act of 1986. The EPA concluded that most property assessments represented reasonable efforts to provide professional opinions as to the environmental liability of a site; however, the EPA also concluded that few environmental site assessments truly quantify, test, and confirm legal or regulatory compliance. At least two other EPA documents have touched on ESA issues. The 1997 report *Expedited Site Assessment Tools for Underground Storage Tanks Sites: A Guide for Regulators* (EPA/510/B-97/001) noted that “a review of existing information should include past and current land use...,” and provided a table of sources and types of site history information that was abstracted from a book

¹³ ENSR Corporation & Policy Planning & Evaluation Inc. 1989. *Selected Current Practices in Property Transfer Environmental Assessment*. A Report Prepared for the U.S. EPA Office of Policy, Planning & Evaluation. September.

published in 1993.¹⁴ In 1998, the EPA considered the phased assessment process in regards to its own facilities with the publication of *Guidelines for Acquiring & Transferring EPA Real Property and Complying with the Community Environmental Response Facilitation Act*.

In addition to the standards developed by professional organizations are standards and guidelines developed by federal, state, and local agencies as well as financial, real estate, appraisal and banking institutions. Many of these are specific to certain types of properties (agricultural, schools, mining, airfields, etc.) and are tailored to the specific needs of a government organization.

Conclusions

As discussed at the beginning of this article, the EPA recently issued a direct final rule that clarifies the Small Business Liability Relief & Brownfields Act. For the interim, brownfields owners may use the current ASTM E1527-2000 and its processor ASTM E1527-1997 for conducting all appropriate inquiry into past activities on a Brownfield in order to establish the innocent landowner defense allowed for under CERCLA for properties purchased after May 31, 1997. Until the EPA promulgates regulations it is unknown what the characteristics of the EPA “all appropriate” inquiry standard will be. However, a negotiated rulemaking committee was established in early 2003 to meet and discuss the meaning of “all appropriate inquiry.” The first meeting was held on April 29, 2003 and subsequent meetings were held on June 10-11, July 8-9, and September 9-10, 2003. The most significant result of the EPA’s efforts to identify “all appropriate inquiry” was the release on August 6, 2003 of a draft for discussion purposes only amended language to Title 40, Chapter 1 of the Code of Federal Regulations (Subchapter J,

¹⁴ Cohen R.M. and Mercer J.W. 1993. *DNAPL Site Evaluation*. Boca Raton: CRC Press.

Superfund, Emergency Planning and Community Right-to-Know Programs, part 312--innocent landowners, standards for conducting all appropriate inquiry). Although this document is not a proposed or final regulation it does forecast the direction the agency is considering regarding the meaning of “all appropriate inquiry.” There are many similarities to the ASTM standard as EPA attempts to define what an environmental professional is, what they must do to adhere to “all appropriate inquiry,” and specific steps required to meet standards of “all appropriate inquiry.” Perhaps most important is that the draft document pays heed to historical uses of the property under investigation and requirements for obtaining and reviewing historical sources of information. Unlike the ASTM standard which continues to require searching historic uses of a property back to 1940, the EPA is proposing a search that covers a period of time *as far back* as a property is occupied by structures or was used for specific types of uses (agricultural, residential, commercial, industrial or governmental purposes). If this standard becomes regulation, for the first time, site assessors will not be encumbered by an artificial timeline but will truly have the latitude to delve deep into a property’s history and more than ever before be able to more accurately characterize historic site uses.