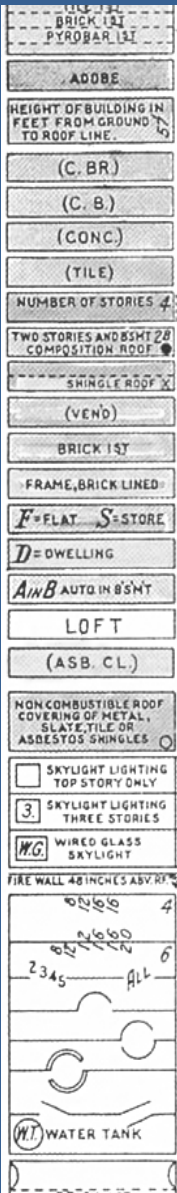


Issue No. 5 | Spring 2017 Is It a REC? – Use of Historic Fire Insurance Maps



Site history is a key consideration in identifying *recognized environmental conditions (REC)* when conducting a Phase I Environmental Site Assessment (ESA). The U.S. EPA's amended All Appropriate Inquiries (AAI) Final Rule and the American Society for Testing and Materials (now ASTM International) E1527-13 "Standard Practice for Environmental Site Assessments" specifically lists types of information that would sufficiently identify uses and related RECs for a property. ASTM Historical Use Information calls out fire insurance maps as a Standard Historical Source, and provides a limited description of their use:

fire insurance maps—maps produced for private fire insurance map companies that indicate uses of properties at specified dates and that encompass the property. These maps are often available at local libraries, historical societies, private resellers, or from the map companies who produced them.

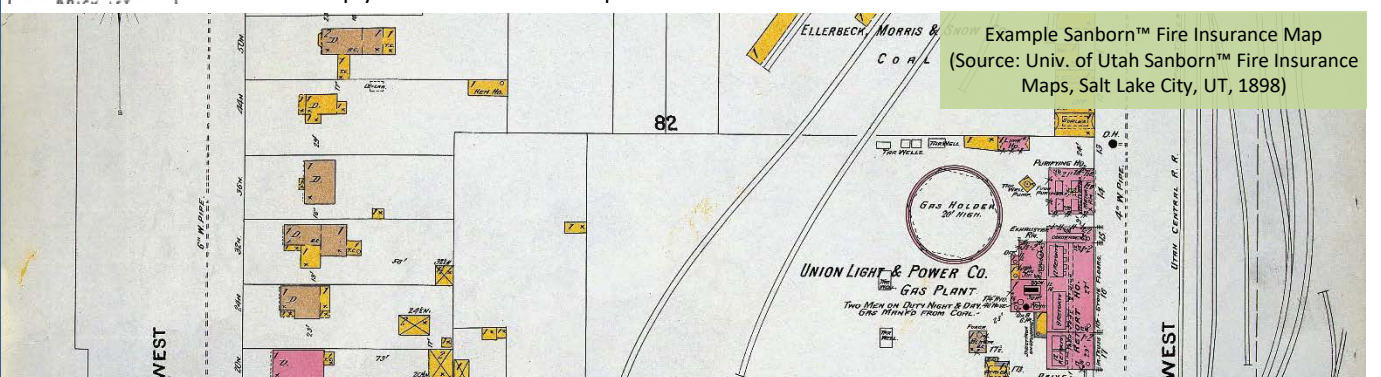
The maps are good sources of information for how a subject property and its surroundings were used or developed over a period of time. But how can we maximize the information on these carefully produced and visually pleasing snapshots of history to identify RECs in our environmental site assessments?

The History of Historic Fire Insurance Maps

Fire Insurance Maps (FIMs) are often called Sanborn Maps™, or "Sanborns", after the D.A. Sanborn Company. Daniel Alfred Sanborn, a civil engineer and surveyor, began producing FIMs in 1866, and his company published its first FIM in 1867 for a portion of the City of Boston. The Sanborn Map Company™ quickly grew as insurance providers depended on the map information to underwrite policies. The maps were at first created solely to aid the insurance industry in determining liabilities based on building materials, density of development, and proximity to combustible materials (wood construction, gas lines, etc.) as well as proximity to water lines and fire departments. The FIMs produced by Sanborn™ show building footprints, construction materials, height or number of stories, locations of windows and doors, building use, lot lines, road widths, railroads, and water facilities. The maps also show street names and property boundaries along with the names of most public and commercial buildings. The Sanborn Maps™ are often the best detailed map of a town or city dating from the mid-1800s. As the insurance industry used other methods of underwriting, the demand for FIMs declined. Sanborn™ map production was significantly reduced in the 1960s and became limited to occasional updates of previous maps. The Sanborn™ Company is in business to this day, now providing a range of digital mapping and geospatial imagery services.

Though dominating the FIM industry for some time, Sanborn™ was not the first or only map producer. Several companies began producing FIMs in the 1700s in London, and FIMs were produced in the U.S. from as early as the 1850s in New York City and from 1888 to the 1960s by the Dakin Publishing company of San Francisco. FIMs produced by other companies are available, including Western Fire Insurance Map Co., William E. Baist, and Whipple Fire Insurance Co. The Sanborn™ Company would acquire FIM competitors as part of its growth strategy and so other company products became part of the Sanborn™ collection. While it is therefore common to refer to all FIMs as Sanborns, the more accurate and all-inclusive reference would be simply as Fire Insurance Maps.

Example Sanborn™ Fire Insurance Map
(Source: Univ. of Utah Sanborn™ Fire Insurance Maps, Salt Lake City, UT, 1898)



Availability of FIMs

Environmental professionals performing Phase I ESAs as well as members of the insurance, lending and real estate industries have become accustomed to purchasing digital versions of FIMs through a number of service providers who have rights or access to archives. The Sanborn™ Company reports that its archives contain more than 1.3 million Sanborn Maps™ covering over 12,000 U.S. cities and towns. Access to these maps is still available from Sanborn™ or several resellers.

Many FIMs are in the public domain, however copyright laws for use and reproduction of some Sanborn Maps™ may still apply. City and town governments and local libraries have partial collections of FIMs available online or to review from their print collections, and many universities have complete or near complete collections for their particular state. The Library of Congress also maintains an extensive FIM collection, with approximately 1.5 million original maps from all 50 states. The Library of Congress has contracted over the years to digitize portions of their FIM collection, making available high resolution color versions that were previously available digitally only in black and white. Links on where to find FIMs including other service providers from which you can order maps separately or as part of their other environmental data packages are listed below.

How to Use FIMs to Evaluate Recognized Environmental Conditions

Historical research is the most obvious use for FIMs, allowing past insight into urban growth and decline patterns, evolution of neighborhoods, and simple genealogy. The Environmental Professional is searching for RECs, and the FIMs can sometimes unveil these like no other source. Maps produced on a one inch = 50 feet (1:600) or 100 feet (1:1200) scale on 21-inch x 25-inch sheets that are cross-ruled in one-inch squares and color coded offer the best opportunity to find such relevant clues as:

- annotated information of building types and uses, providing a direct means to locate and identify gasoline stations, dry cleaners, manufactured gas plant (MGP) sites, and other uses that raise the potential for RECs
- specific hazardous and/or combustible materials identified by name, like gasoline and fuel oil tanks, or asbestos in buildings (think anything flammable as well as fire retardant would be of interest to insurance companies)
- Color codes to denote function and material (pink = brick; yellow = wood frame; blue = concrete block or stone; olive green = fire resistant; gray = metal/iron).

The FIMs can be so packed with information, added and updated over time, that using a map legend is essential. Sometimes these are included on the map itself but it's best to have one or several at your side to fully understand and interpret the various building jargon, abbreviations, codes, and symbols that are so prevalent in most all FIMs.

Because the maps were produced and updated in continuing series for each area, FIMs should be used to show changes over time much like aerial photos depicting the first occurrence of development and later expansions and changes in use. Many FIMs were produced in volumes that were re-printed over certain intervals to show changes, or updated with correction slips that overlay areas with changes. This is why some digital scans and prints of FIMs appear to have taped corrections in some areas. Such a catalogue of progress over time allows the EP to overlay FIMs over photos and provide a true visual record of site features.

Some Public and Private Sources of FIMs

Library of Congress Geography and Map Reading Room <https://www.loc.gov/rr/geogmap/sanborn/>

The Sanborn Map™ Company Inc. <http://www.sanborn.com/sanborn-fire-insurance-maps/>

University of California Berkeley <http://www.lib.berkeley.edu/libraries/earth-sciences-library>

Historical Information Gatherers Inc. (HIG) <http://www.historicalinfo.com/>

EnviroSite Corporation <http://www.envirositecorp.com/>

EnviroCheck Solutions <http://www.envirochecksolutions.com/main>

Environmental Risk Information Services (ERIS) <http://www.erisinfo.com/>

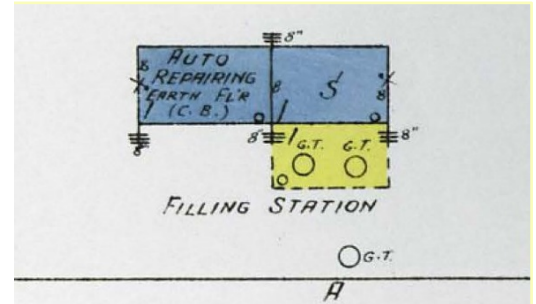
Environmental Data Resources (EDR) <http://edrnet.com/>

GeoSearch <https://www.geo-search.com/maps>

"Sanborn" and
"Sanborn Maps" are
registered
trademarks of The
Sanborn Library,
LLC.

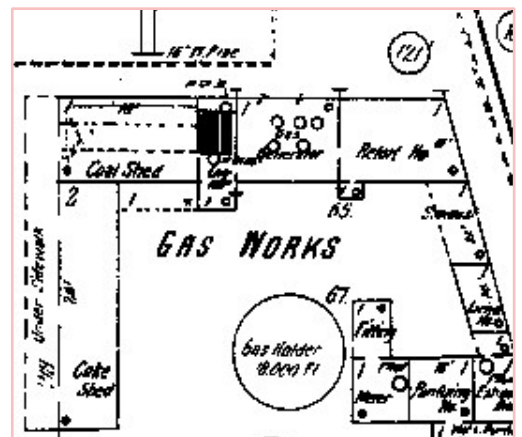
Case Studies

The requirements of ASTM 1527-13 encourage the use of multiple sources of information to identify RECs, but sometime it's that one source which provides the key element. Fire insurance maps can often be that key source. A pre-acquisition site assessment at a historic property uncovered several references to past use as auto repair. A regulatory database search and subsequent freedom of information act (FOIA) request confirmed that gasoline underground storage tanks (USTs) were installed in 1985 and removed in 2002, and closure sampling identified no releases. A No Further Action (NFA) letter had been issued by the state regulators and the case was closed. The Sanborn Maps™ were the only source that showed previous gasoline service stations had operated at the property as early as 1925. The closure or condition of the previous USTs, which according to the FIMs included as many as three gasoline tanks, was not documented. The service station building also was identified on the maps as conducting auto repair in an area of the building that previously had an earth floor. A portion of the Sanborn Map™ is shown to the right. The 2002 closure sampling could not be considered sufficient to document soil and groundwater conditions potentially affected by the previous USTs and past vehicle repair, so a Phase II ESA was required. The Phase II sampling was able to pinpoint releases attributed to the previous gasoline tank use, which still allowed for site closure and issuance of a more accurate NFA.



The map symbols above depict this property had a one-story gasoline filling station constructed of 8" thick concrete block (C.B., colored blue) with one-story wood frame canopy (dotted line colored yellow). The building had two outside wall window openings and interior wall openings, and had a partial earth floor where auto repairing was conducted on the left side of the building and a "store", presumably the service or customer area, on the right side. The property also had three gasoline tanks, shown as G.T. (Image reproduced with permission from Historical Information Gatherers, Inc.)

Almost every urban area has a legacy of manufactured gas plants (MGP) that produced gas to light streetlamps from the early 1800s into the 20th century. These industrial sites with remnant storage tanks and disposal areas for spent coal waste and MGP byproducts, even though many have been out of use for decades, are difficult to hide. One such MGP property went unnoticed in a Phase I ESA that was performed when the local municipality obtained title to the property. A later ESA performed as part of a U.S. EPA Brownfield assessment grant used a careful analysis of Sanborn Maps™ that identified a MGP on a 1910 FIM depicting the subject property. When overlaid onto the site plan and aerial photo, this century-old FIM clearly showed locations of a remnant gas manufacturing building and a long overgrown and rusted outline of the "gasometer", or former gas product storage tank. The map was accurate enough to show position of the former MGP works relative to property lines and, more importantly, allowed a more precise and efficient placement of Phase II ESA sampling locations.



Manufactured Gas Plant depicted on FIM (Source: Library of Congress Sanborn™ Sampler)

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SANBORN MAP LEGEND

CODING OF NON-RESIDENTIAL FIRE-RESISTIVE STRUCTURAL UNITS FOR FIREPROOF AND NON-COMBUSTIBLE BUILDINGS

FRAMING	FLOORS	ROOF
CODE STRUCTURAL UNIT	CODE STRUCTURAL UNIT	CODE STRUCTURAL UNIT
A. Reinforced Concrete Frame.	1. Reinforced Concrete, Reinforced Concrete with Masonry Units, Pre-cast Concrete or Gypsum Slabs or Planks.	a. Reinforced Concrete, Reinforced Concrete with Masonry Units, Reinforced Gypsum Concrete, Pre-cast Concrete or Gypsum Slabs or Planks.
B. Reinforced Concrete Joists, Columns, Beams, Trusses, Arches, Masonry Piers.	2. Concrete on Metal Lath, Incombustible Form Boards, Paper-backed Wire Fabric, Steel Deck, or Cellular, Ribbed or Corrugated Steel Units.	b. Concrete or Gypsum on Metal Lath, Incombustible Form Boards, Paper-backed Wire Fabric, Steel Deck, or Cellular, Ribbed or Corrugated Steel Units.
C. Protected Steel Frame.	3. Open Steel Deck or Grating.	c. Incombustible Composition Boards with or without Insulation, Masonry or Metal Tiles.
D. Individually Protected Steel Joists, Columns, Beams, Trusses, Arches.	4. Open Steel Deck or Grating.	d. Steel Deck, Corrugated Metal or Asbestos Protected Metal with or without insulation.
E. Indirectly Protected Steel Frame.		
F. Indirectly Protected Steel Joists, Columns, Beams, Trusses, Arches.		
G. Unprotected Steel Frame.		
H. Unprotected Steel Joists, Columns, Beams, Trusses, Arches.		
O. Masonry Bearing Walls only.		

The coding to left, for framing, floor and roof structural units is used in describing the construction of fire-resistive buildings. In addition, reports for fire-resistive buildings will show the date built, wall construction other than brick, and ceilings.

FD-1962 (CONC)
A-1-2
A fireproof building built in 1962 with concrete walls and reinforced concrete frame, floors and roof.

FDX-1962 (METAL SHEET)
B-2-2
A fireproof building built in 1962 with metal panel walls, reinforced concrete columns and beams, concrete floors on metal lath and gypsum slab roof; non-combustible ceilings.

NC-1962 (C, A)
H-2-d
A noncombustible building built in 1962 with concrete block walls; unprotected steel columns, beams and joists; concrete floors on metal lath and steel deck roof.

GLOSSARY

A-B LINES An arbitrary boundary between adjoining sheets.

ARY Above.

A.P.A. Equipped with fire detecting devices which automatically signal central fire department.

AIR COND. Air-cooling system employing ducts through floors.

APRON WALL A masonry wall extending 4' or less above foundation.

ASSOC. RISK Risk not underwritten by Stock Fire Ins. Companies.

BASEMENT A story having its floor below ground & its ceiling at least 4' above ground.

Cook County, Ill. A floor of a building next below the first floor. Shown by the symbol B following story height.

SUB-BASEMENTS or sub-cellars (stories below the 1st basement), are shown by the symbol SB following basement symbol.

CHIMNEYS (Applicable to maps in Rocky Mountain & Pacific Coast States).

CB Brick, stone, concrete brick & concrete chimneys.

C.B.C. Concrete block chimney.

C.C. Non-standard concrete chimney.

T.C. Tile chimney.

P.C. Patent chimney.

I.C.B. Iron chimneys.

S.P. Stove pipe.

S.P.V. Stove pipe with patent ventilator.

MASONRY CONSTRUCTION

Important interior and all exterior masonry walls of all non-residential buildings are shown with weighted (—) lines. Masonry walls of residential buildings are shown with a standard line and the construction is noted on all buildings diagrammed after July, 1963.

WALLS	PARTITIONS	OPENINGS (Interior)	OPENINGS (Exterior)
8" Brick	Mixed Construction of Concrete Blocks, Brick Faced	Wall with No Openings	1st Floor
12" Concrete	Mixed Construction of Concrete Blocks & Brick	Wall with Double Standard Fire Doors 1st Floor	1st & 2nd Floors
18" & 20" Stone	Masonry Walls, Metal Faced	Wall with Standard Fire Door Basement	3rd Floor
12" & 8" Hollow Tile Wall Thicknesses Placed Relative to Respective Floors	Adobe	Wall with Substandard Fire Doors 1st & 3rd Floors	1st & 4th Fl. with Metal Shutter 1st.
Cinder, Concrete or Cement Brick	Hollow Cinder or Concrete Block Interior Wall Basement to Roof	Wall with Metal & Wired Glass Fire Doors all Floors	10th & 22nd only
Hollow Cinder or Concrete Blocks, Pilasters	Tile Interior Wall Basement to Roof	Wall with Substandard Fire Doors 1st, 2nd & 3rd Floors & Unprotected Opening 4th Floor	10th to 22nd Fl.
Cement Brick End Wall	Cement Brick End Wall	Wall with Small Unprotected Openings only	Glass Block
		Wall with Unprotected Openings all Floors	Wired Glass in Metal Sash 2nd & 3rd Fl.

NON-MASONRY CONSTRUCTION

Non-masonry walls are shown with fine (—) lines. (Wall construction other than wood and stucco on wood frame is noted)

Wood & Stucco & Cement Plaster, Etc. on Wood Frame	Wood Sash & Glass	Iron Building with Wood Roof. (Location of Extensive Wood Areas Specifically noted)	Asphalt and/or Asbestos Protected Metal on Steel Frame	Asphalt and/or Asbestos Protected Metal on Steel Frame
Brick Veneered on Wood Frame (Other Types of Veneered on Wood Frame Specifically Noted)	Metal Sash & Glass	Asbestos Clad on Wood Frame, Noted in Non-Residential Structures only.	Stucco, Cement Plaster, Etc. on Steel Frame	Asphalt and/or Asbestos Protected Metal on Wood Frame
Mixed Masonry & Non-Masonry (Type of Masonry Specifically Noted)	Metal Clad on Wood Frame	Mixed Wall -- 9" of CB With Metal Sash Above	Gumite on Steel Frame	Glass Panels
Wood, Brick Lined, Br. Filled or Brick Nogged	Iron Building	Metal Panels		

FIRE PROTECTION

Fire Department Connection	Single Hydrant	Frame Enclosed Elevator with Self Closing Traps	2 Stories & Basement 1st Floor Occupied by Store
Automatic Sprinklers throughout contiguous sections of single risk	Double Hydrant	Concrete Block Enclosed Elevator with Traps	2 Residential Units above 1st Auto in Basement Drive or Panageway Wood Shingle Roof
Automatic Sprinklers all floors of building	Triple Hydrant	Tile Enclosed Elevator with Self Closing Traps	Iron Chimney
Automatic Sprinklers in part of building only (Note under Symbol indicates protected portion of building)	Quadruple Hydrant of the High Pressure Service	Brick Enclosed Elevator with Wired Glass Door	Iron Chimney (with Spark Arrestor)
Automatic Chemical Sprinklers	Water Pipes of the High Pressure Service	Open Hoist	Vertical Steam Boiler
Chemical Sprinklers in part of building only (Note under Symbol indicates protected portion of building)	Water Pipes of the High Pressure Service as Shown on Key Map	Hoist with Traps	Horizontal Steam Boiler
Not Sprinklered	Public Water Service	Open Hoist Basement to 1st	Width of Street between Block Lines, not Curb Lines
Automatic Fire Alarm	Private Water Service	Stairs	Ground Elevation
Water Tank		Number of Stories Height in Feet	House numbers nearest to Buildings are Official or Actually up on Buildings. Old House Numbers are Farthest from Buildings
Outside Vertical Pipe on fire escape		Composition Roof Covering	
Fire Alarm Box Noted "HPFS" on High Pressure Fire Service		Parapet 8" above Roof	
		Parapet 12" above Roof	
		Parapet 24" above Roof Occupied by Warehouse	
		Metal, Slate, Tile or Asbestos Shingle Roof Covering	
		Parapet 48" above Roof	

RESIDENTIAL OCCUPANCY SYMBOLS

D. Single family unit or as qualified by a number.

E. - APIS A multi-family residential building corresponding with local Rating Bureau definition in family units per floor, story height, & separation of entrance.

ROOM'G. A residential building normally occupied by a single family but with 10 or more rooms rented for lodging purposes.

SECTIONS. 6 rooms in Arizona, California, Nevada, Utah & Montana; 5 rooms in Oregon & Washington; 4 rooms in Idaho & Hawaii.

FIRE RESISTIVE CONSTRUCTION SYMBOLS

F.P. Approved masonry walls, floors & roof, interior supports of approved masonry, concrete, and/or protected steel.

F.P.S. F.P. qualifications entire interior or sub-standard walls.

N.C. Fire relative with unprotected structural steel units.

HOLLOW WALL A bonded masonry wall having a continuous air space within.

I.E.P. Independent Electric Plant.

IMPASSABLE Nottraversable due to construction.

LEDGED WALL A masonry bearing wall with extended ledges to support floors.

LOFT Tenanted by industrial occupancies.

M.L. & P. Concrete or plaster applied to metal lath or wood studs.

M.S. & G. Metal sash & glass.

NOT OPEN Streets appearing on records but not open on ground.

Q.L. Windows overlooking the roof above the overlying floor of an adjoining building.

O.L. Open between ground and first floor.

REINFD. Masonry reinforcing columns in walls.

SKYS. Skylights.

SL. ST. Slate attached to wood siding.

SM. HO. Smoke House.

STAIRS Shown by crossing diagonal lines on diagram.

SUSP'D. Suspended ceilings below floor and/or roof beams.

SYST. System.

TRANS. Transformer.

WD. Wood.

LAND USE CODES APPLICABLE TO CHIMNEYS DIAGRAMMED AFTER 1962

R	RESIDENTIAL	M	MANUFACTURING
RT	RESIDENTIAL	P	PUBLIC OR INSTIT.
C	COMMERCIAL	U	UTILITY
W	WAREHOUSE	F	TRANSPORTATION

NUMERICAL FIGURES WITHIN SQUARE OF REGULARITY IN EACH CATEGORY

24 Reference to Adjoining Page 5 Block Number

+ Fire Department as shown on Key Map