How Many Brownfields Does California Have?

by Corynn Brodsky

"Where are all the brownfields?" This question is posed frequently by environmental regulators, city planners, and academics alike, as they attempt to address the challenges that brownfields pose to the revitalization of our communities. This is a much more complicated and nuanced question than it may seem. In order to begin to answer this question, one must first understand the origin of the term "brownfield".

The field of brownfield redevelopment originated with the passage of the Superfund law – the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) – in 1980 and the equivalent California state statute in 1981. These laws hold property owners liable for the cost of cleanup, regardless of whether they actually caused or contributed to the contamination. This liability scheme has proved highly successful in many ways, forcing responsible parties to acknowledge and pay for their pollution. However, a major side effect has been that real estate transactions involving environmentally contaminated sites (whether the contamination is real or perceived) have been virtually ground to a halt.

While CERCLA was initially passed to address the country's largest, most severely contaminated land, the law's harmful effect on the redevelopment of the nation's multitude of smaller, less contaminated properties soon became apparent and needed to be addressed.

In 1995 the federal Environmental Protection Agency (EPA) created a new program to encourage the cleanup and redevelopment of this new class of properties, termed "brownfields." The EPA defines a brownfield as "a property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant." This definition frames the brownfields issue fundamentally as a real estate problem; the real or perceived contamination is an impediment to the best use of real property. Cleaning up a brownfield often results in the removal of a potential threat to human health or the environment. However, the EPA program recognizes that since the problem is grounded in the market forces of real estate development, so too must the solutions (i.e. financial and technical assistance) focus on tipping the balance of those market forces in favor of reuse.

The EPA's brownfields program – and brownfield redevelopment as a whole – is still relatively new, and as such, there is a desire to gain an understanding of how big of a problem brownfields pose. There is currently an ongoing effort within the federal and state regulatory communities to develop inventories of "known brownfield sites." Unfortunately, there exist no standard criteria for determining whether or not a given property is a "brownfield." This is because it is not simply the contamination itself that makes a property a brownfield, but rather the effect this contamination has on the ability of a property to realize its highest and best use. Knowing this, it becomes clear that state brownfield "inventories" have limited value in providing an accurate account of a state's brownfields. State inventories are simply lists of properties where some level of regulatory oversight has occurred. Such a centralized state database can serve as a powerful tool to environmental regulators for maximizing the coordination and efficiency with which they address

contamination issues that have been identified. However, a true inventory of brownfields includes the ones that have yet to appear on any regulatory "radar screen".

This brings us to the main challenge of identifying brownfields: it is essentially an exercise in identifying a specific *lack* of activity. The majority of brownfields are located in underserved urban communities where property values are depressed to begin with. Add to this the possibility of contamination, with its associated additional cleanup costs and liability concerns, and it becomes very difficult to attract any potential developer. If you are approaching the challenge from the perspective of a community developer (public or private) looking for development opportunities, then local, neighborhood-specific knowledge becomes key. Local governments, community development corporations, and neighborhood groups are the folks with the local knowledge base necessary to judge not only the perceptions of contamination and underutilization in their communities, but also the realistic prospects for revitalization of individual properties.

Some communities have attempted to create their own local brownfield inventories for the purpose of identifying potential development opportunities. In this context, the search for brownfields is essentially an effort to locate properties that match the following three criteria: they have a history of land use that indicates strong potential for contamination; they are not currently developed at their highest and best use; and there is a causal link between these two attributes. Such efforts have met with varying levels of success. In 2000 the city of Gardena, CA received a grant from the EPA to create its own city-wide brownfield inventory. Drawing on a combination of local knowledge, elementary records research, and on-site visual assessment, the city identified forty six vacant or abandoned properties where there was a strong indication of contamination. They then identified which of these properties presented the most promising redevelopment opportunities and approached the

owners about engaging with the city in assessment and cleanup activities. One challenge faced by many municipalities attempting to put together such lists is that property owners may object to being included on such a list (opening the city up to potential lawsuits), for fear that the stigma of contamination, even if not confirmed, could negatively effect the value of their property. Gardena avoided this dilemma by only making public those sites where the property owner agreed to work with the city to clean up the site and, most importantly, to devise and execute a redevelopment plan. The city is currently in the process of updating their inventory, and one of the key lessons they have learned in building and maintaining their inventory is that when it comes to identifying brownfields, there is no cookbook. Each site requires its own customized approach, both in analyzing the contamination and its impact on redevelopment, and also in the strategy and tools employed to move the property through the cleanup and redevelopment process.

The example of Gardena shows that a locally-generated brownfield inventory can be an effective tool for city planners seeking to identify redevelopment opportunities. For academics and policy makers who are attempting to gain an understanding of the magnitude of the problem that brownfields pose to community revitalization efforts on a much larger state-wide, regional, or even national scale, the process is conceptually the same as that used by local community developers: analyze land use patterns and economic indicators to estimate the number of properties where there is a possible relationship between indication of contamination based on prior use and the property not realizing its fullest potential. This is what we've attempted to accomplish with this study. For an analysis of land use patterns, we calculated the amount of California's land that is developed for urban use, we then made some conservative assumptions about the portion of that land that may be contaminated from industrial or commercial use. We also looked at North American Industry

Classification System (NAICS) code reporting to estimate the number of properties in California where registered business activities indicate a high probability of land contamination. To analyze economic indicators, we drew on a recent UC Berkeley study to estimate the number of non-residential properties in California that are currently developed at a level significantly less than their fullest economic potential. We also included in our calculations two reports of "known" brownfields – one from the state regulatory oversight agency Cal/EPA and the other from a survey of local municipalities' brownfield inventories. Finally, we included the results of a GAO report that similarly attempts to estimate the number of brownfields present throughout the country. Our ultimate estimated number of brownfields is an estimated range based on all of these sources.

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ESTIMATE OF POTENTIAL BROWNFIELD SITES IN CALIFORNIA

[notes] SOURCES	LISTED SITES			UNLISTED SITES			TOTAL SITES		
	Lower	Upper	Mean	Lower	Upper	Mean	Lower	Upper	Mean
[1] GAO							54,000	120,000	85,500
[2]Cal-EPA			60,829	60,829	121,658	91,244†			
[3]US Conference of Mayors	59,079	100,808	79,943	59,079	201,616	130,785†			
[4]General Business Statistics							100,000	260,000	180,000
[5]I/L Ratio							75,136	140,686	107,911
[6]Analysis of geographical statistics							65,000	130,000	97,500
AVERAGE ESTIMATES	59,079	100,808	70,386	59,954	161,673	111,015	73,534	162,672	117,727
BLENDED TOTAL ESTIMATES††							96,285	212,577	149,564*

*CCLR Estimates between 150,000 and over 200,000

† Dr. Robert Simmons has estimated that the number of unlisted sites in California could be 1 to 2 times the number of listed sites. While he has not conducted a detailed statewide analysis of California, he has analyzed brownfields in Cuyahoga County (Cleveland) in detail, and arrived at an estimate for unlisted industrial and commercial sites as 5 times the number of listed sites in that county. For [2] we determine the lower range of unlisted sites as the mean number of listed sites and the upper range as two times this figure. In [3] we determine lower range of unlisted sites as the lower number of listed sites and the upper range as two times the upper number for listed sites.

†† In order to obtain the Total Blended Estimates the Average Estimates for listed and unlisted sites were combined for each of the three columns (lower, upper, and mean). The mean of the resulting sum and the Average Estimate for the *total sites* in each of the three columns (lower, upper, and mean) was then taken

NOTES: [1] GAO's nationwide estimates were 450,000-1,000,000 sites. Ranges shown were adjusted based on California's population, which represents 12% of the U.S. population. These are 2004 estimates, so they are 3 years out-of-date. This figure is taken from the United States GAO Report to the Congressional Requesters: Brownfield Redevelopment (Dec. 2004) (GAO-05-94)

[2] This number represents the sum of the 8,610 EnviroStor sites reported in July 2007 by the Department of Toxic Substances (DTSC) and the 31,000 closed and 13,500 open UST cases as well as 1,453 open, 1,824 closed and 4,442 backlogged non-UST cases reported as of July 2007 by the 9 Regional Water Resources Control Boards.

[3] The upper range estimate is extrapolated from the data reported by all 159 cities nationwide participating in this survey (2006), which amounts to 96,039 acres of brownfield land. This amount was extrapolated based on population for California relative to the population of the 159 cities and based on the assumption that the average size of industrial/commercial brownfield sites is approximately 1 acre (based on city survey results that indicated 2/3 of contaminated sites are less than 1 acre). The lower range estimate is extrapolated from the data of the 15 California cities which participated in the survey, and is similarly based on relative population and the assumed approximate size of 1 acre for all sites.

[4] According to the North American Industry Classification System (NAICS) code reporting in 2002 there were approximately 400,000 reporting units in California which are industries that have a high probability of some environmental contamination. These industries consist of manufacturers in chemical, petroleum, primary metals, and rubber/plastics industries (36,000); whohlesalers of chemical, metal, and petroleum products (34,000); auto repair shops (167,000); laundry and dry cleaning providers (42,000); and gas service station companies (121,000). Separately, there were a total of 364,407 shipments of hazardous waste (manifests) from businesses in California in 2006. We took the 400,000 businesses with a probability to exhibit some form of environmental contamination, according to the NAICS codes, as our starting base. We assumed a rate of contamination of 25% for the lower range and 65% for the upper range.

[5] The California Statewide Infill Study was conducted at the Institute for Urban and Regional Development (IURD) at UC Berkeley during 2004 and 2005, with Professor John Landis as the principal investigator. Infill parcels were selected based on what is known as an improvement-value-to-land-value (IL) ratio. In California, county assessors separately calculate the value of the building and the land on which it is located, and simply dividing the two creates the IL ratio. Urban parcels for which improvement values are less than land values are widely considered to be economically under-utilized. For most occupied properties in good condition, structure values exceed underlying land values by 100% or more. For the purposes of the Statewide Infill Study, the IL threshold was set at 1 for commercial and multi-family residential parcels, and 0.5 for single-family residential parcels. These are not always perfect measures, but IL ratios do have a theoretical and practical background for being used to target potential refill parcels. In this study we used the number of non-residential infill parcels with an IL ratio of 0-0.25 as the lower range and all non-residential infill parcels under the IL ratio threshold as the upper range.

[6]California has a land area of 156,000 square miles or approximately 100 million acres. About 1/3 of its land is used for agriculture. We compiled the total acreage for California's cities (478 cities), which totaled approximately 5.1 million acres. Starting with this number, we made the following assumptions:

-Assume 25% of the cities' land is industrial or commercial, which will be our focus (assumes 60% is residential/agricultural, and 15% is infrastructure/open spaces).

-Assume 5% of industrial/commercial land is contaminated for lower range, and 10% for upper range.

-Assume that the average size of industrial/commercial sites is approximately 1 acre (based on city survey results that indicated 2/3 contaminated sites are less than 1 acre).