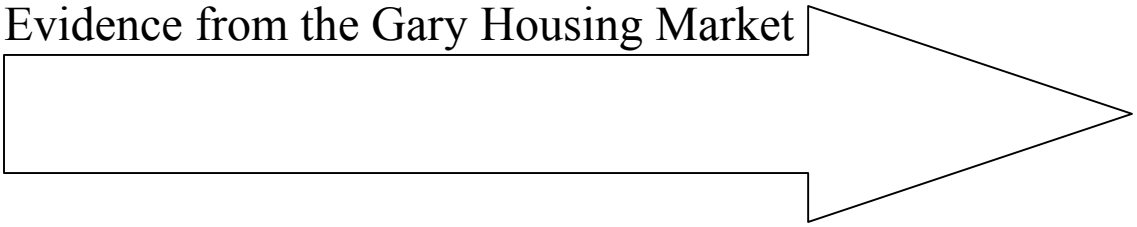
REPORT ON THE ECONOMIC BENEFITS OF THE GRAND CALUMET RIVER REMEDIATION PROJECT: Evidence from the Gary Housing Market



by

Daniel P. McMillen
Professor of Economics and
Director, Center for Urban Real Estate
Department of Economics
University of Illinois at Chicago

for

Delta Institute
Chicago, Illinois

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Delta Institute

53 West Jackson Blvd
Suite 230
Chicago, Illinois 60604
312 554 0900
www.delta-institute.org
delta@delta-institute.org

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Economic Benefits of the Grand Calumet River Remediation Project: Evidence from the Gary Housing Market

A Report Prepared for the Delta Institute

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Daniel P. McMillen
Professor of Economics
Department of Economics (MC 144)
University of Illinois at Chicago
601 S. Morgan St.
Chicago, IL 60607
312-413-2100
Fax: 312-996-3344
E-mail: mcmillen@uic.edu

Executive Summary

This report summarizes the results of a formal analysis of the economic benefits of the U. S. Steel Corporation's Grand Calumet River Remediation Project, which will remove highly-contaminated sediments from the 5-mile east branch of the Grand Calumet River running through Gary, Indiana. The analysis was conducted to estimate the economic benefits of the sediment remediation project, and is the first phase of a conceptual redevelopment master plan for the east branch of the river, conducted by a partnership between the Delta Institute, the Grand Calumet Task Force, and City of Gary. This larger planning process is known as the Gary Riverfront Revival.

The analysis showed that the current contaminated state of the river has a significant negative impact on the value of nearby residential property. Homes and vacant lots along the river are currently priced much lower than similar properties only four blocks away. Removing the contaminated sediments could increase home values by an average of 27 percent. For individual homes, these changes are not large. However, they add up to a significant amount: if the discount associated with sites near the river disappears, the market value of nearby homes and vacant lots may rise by over $5,900,000. In a neighborhood with an average home value of less than $40,000, this is an impressive amount indeed.

These estimates are conservative, since they consider only the removal of the river's negative economic effects through sediment remediation. They do not take into account the possibility that the river will be transformed into a community asset over the coming years so that homes near the river will trade at a premium relative to more distant sites. Nor do these estimates take into account the potential benefits that might be

enjoyed by the entire city of Gary if people are offered new opportunities related to the restored river. No longer having the river near your home being one of the nation's most heavily polluted waterways is indeed a very direct benefit that will be capitalized into home prices. Redevelopment opportunities that protect the restored river and meet community needs could further increase these benefits for nearby residents and the city as a whole.

1. Background

Bordering the downtown commercial district and an established neighborhood of generally well-built and maintained homes, the Grand Calumet River has the potential to be a tremendous resource for the residents of Gary. The river could offer recreational opportunities such as fishing and canoeing to all of Gary's residents. Bike and foot paths running along the riverbank and through a local park could be enjoyed directly by people living in the neighborhood, with access available downtown for people living farther away. In many cities, home prices are high along rivers because people value the views and recreational benefits rivers offer.

Unfortunately, the Grand Calumet River is currently more of a detriment than a resource to the people of Gary. For decades, industrial waste and sewage were poured into the river. The river is far from scenic, and no one should think of fishing in it. Local residents warn their children not to play near it for fear of the accumulated contaminants along its shores and in its riverbed. It currently is possible to visit downtown Gary and the neighborhood bordering the Grand Calumet River without realizing that the river is nearby. There are no footpaths along the river. The river plays no role in the single park along the banks of this five-mile stretch.

This bleak situation is about to change. Following the 1998 Conservation and Recovery Act order and a 1999 federal consent decree, the U.S. Steel Corporation began a historic dredging operation that could achieve a higher degree of ecological integrity for that portion of the Grand Calumet River. At a cost to the company of $41 million, the company will remove contaminated sediments in the river along a 5.1 mile stretch that includes the commercial area of Gary and a nearby residential neighborhood. Vegetation

will be planted along the banks, steps will be taken to improve the fish habitat, and U.S. Steel will deed 32 acres of adjacent land to the National Park Service. When completed, the Grand Calumet River may become a magnificent resource for Gary.

This report summarizes the results of a formal analysis of the economic benefits of the dredging plan. Rather than attempt to estimate the benefits of unspecified future plans for using a cleaned-up river, the approach taken here answers a more conservative question: what is the monetary cost to nearby residents of the current undesirable state of the Grand Calumet River? Homes along the river sell at a significant discount. Our results indicate that the value of a home directly adjacent to the river is 27% lower than a similar home only four blocks away. The deleterious effect of the river continues still farther than this first block: the value of homes four blocks away from the river is 17.8% higher than homes either two or three blocks from the riverbank. Vacant lots also are affected. The value of a vacant lot within two blocks of the river is 4% lower than lots farther away.

These results show that people living near the Grand Calumet River are well aware of its problems. Homes near the river sell for a discount relative to homes farther away. At a minimum, dredging and cleaning the river should remove this discount. Suppose that the discount associated with locations near the river simply disappears, so that otherwise identical homes within four blocks of the river all trade for the same amount – a reasonable expectation in a relatively desirable and fairly homogeneous neighborhood. Then our results predict that the average market value of a home directly adjacent to the river will rise by $8,739 from its current value of $32,368, and the average market value of a home two or three blocks from the river will rise by $6,542 from its

current value of $36,755. On average, the market value of vacant lots within two blocks of the river will rise by $112 from their current value of $2,710. Individually, these changes are not large. However, they add up to a significant amount: if the discount associated with sites near the river disappears, the market value of nearby homes and vacant lots will rise by $5,930,667. In a neighborhood with an average home value of less than $40,000, this is an impressive amount indeed.

In comparison, Leggett and Bockstael (2000) find that a proposed cleanup of the Saltwater Creek inlet of the Severn River near Annapolis, MD should increase property values in the area by $10 million. However, the high values near Saltwater Creek area imply that this apparently large amount represents only a 2% increase in total values. Total amounts are smaller in Gary because average home values are smaller. The total increase in values near the Grand Calumet River is quite large on a percentage basis – 17-27% of property value – because the current state of the river is significantly worse than the much more moderate pollution in Saltwater Creek. Indeed, this estimate of the economic benefits of the Grand Calumet River Remediation Project is conservative. It does not take into account the possibility that the river will become more and more attractive over the coming years so that homes near the river will trade at a premium relative to more distant sites. Nor does it take into account the potential indirect benefits that might be enjoyed by all residents of Gary if they begin to take advantage of new recreational activities offered by the river. The estimates only consider the very direct benefits accruing to residents in the immediate area. No longer having the river near your home being one of the nation's most heavily polluted waterways is indeed a very direct

benefit that will be capitalized into home prices. Further benefits may be enjoyed by these residents if steps are taken to make the river an attraction of its own.

2. The Hedonic Approach

The use of house prices to estimate the benefits of environmental improvements has a long history in economics. The theory behind the approach was developed by Rosen (1974). Houses, like cars or computers, are heterogeneous goods comprising many characteristics. Those characteristics include the actual structure and lot. They also include the site and neighborhood. Naturally, good features raise the price and bad characteristics lower the value. Rosen's insight was that a regression of house prices on the characteristics of the houses reveals consumers' underlying willingness to pay for the house characteristics. This estimated equation is referred to as the "hedonic price function", after the hedonic calculus of the early nineteenth-century philosopher Jeremy Bentham.

The relevant explanatory variables for the hedonic price function include anything that affects prices. School quality, crime, air pollution and other features of the city and neighborhood all potentially affect house prices. Homeownership is the single largest investment for most American households. Buyers work to make themselves well informed about the house and neighborhood. It is not an unreasonable assumption in this situation that homeowners have sufficient information that such adverse conditions as a heavily polluted nearby river are reflected in the price they pay for houses.

Rosen formalized an approach that had already been used empirically to estimate the value of environmental improvements. Early studies such as Ridker and Henning

(1967) and Harrison and Rubinfeld (1978) found that houses tended to be worth less in areas with poor air quality. Since then, more than 80 studies have been conducted, nearly all of which find that poor air quality lowers house prices (Smith and Huang [1993, 1995] provide a thorough review). More recently, studies have focused on the effects of hazardous sites such as smelters and incinerators on nearby home prices. For example, Kohlhase (1991) found being one mile closer to a hazardous waste site in Houston reduced home prices by as much as $2364 in 1985. Similarly, Kiel and McClain (1995a,b) found that proximity to an incinerator in Andover Massachusetts lowers home prices by as much as $8100 per mile. Other examples of hedonic studies of the effects of environmental problems on home prices include Smith and Desvousges (1986); McClelland, Schulze, and Hurd (1990); Michaels and Smith (1990); Stock (1991); Mendelsohn, *et al*. (1992), Reichert, Small, and Mohanty (1992); Smolen, Moore, and Conway (1992); Thayer, Albers, and Rahmatian (1992); Kiel (1995); Dale, *et al*. (1999); Gayer, Hamilton, and Viscusi (2000); and McMillen and Thorsnes (2000, 2003).

Fewer studies have analyzed water pollution. In an early study, Feenberg and Mills (1980) found that homes were worth less in the Boston area when nearby beaches had low water quality. More recent studies by Blomquist, Berger, and Hoehn (1988); Mendelsohn, et al. (1992); Steinnes (1992); and Leggett and Bockstael (2000) also find that home prices tend to be lower in areas with poor water quality.

The hedonic water pollution studies focus on relatively expensive houses, many of which are used as vacation homes. The Gary situation is unique for two reasons. First, the water pollution is extreme. Previous studies such as Steinnes (1992) used measures of water clarity to analyze pollution. The level of pollution in the Grand

Calumet River is far more serious, sufficiently so that the results of studies of hazardous waste sites may be more apropos than the water pollution study results. Second, the area near the Grand Calumet River has low house prices. A general result of the studies reviewed here is that a clean environment is a normal good: high income households are willing to pay more for a reduction in their exposure to pollution than low income households. Vacation homes are worth less in polluted areas, but are homes worth less near a polluted river when there are no expensive homes in the area? As we shall see, Gary residents are no different from the owners of expensive vacation homes in this regard. Homes near the Grand Calumet River are currently worth less than homes farther away.

3. Data and Sample Area

The negative impact of the current polluted state of the Grand Calumet River is confined to an area near the banks of the river. Unlike airborne particulates, which directly affect people living far from the polluting source, the contaminants that have built up over time in even a heavily polluted river primarily affect only those people living in the immediate vicinity. Thus, we focus our attention on the area closest to the river, the Ambridge-Mann neighborhood.

The Ambridge-Mann neighborhood is directly west of downtown Gary. The Grand Calumet River forms its northern boundary. Houses in the neighborhood were built in the early 1900s through the 1950s. Many of the homes were built for managers at U.S. Steel Gary Works. The area is well-served by public transportation. The South Shore line runs through the neighborhood, and buses run to downtown Gary. A park with

baseball fields lies next to the river. Some homes also are adjacent to the river. Residents generally seem proud of their neighborhood. However, they do complain about the state of the river. They tell their children to avoid it, and clearly consider it to have a negative impact on their community.

In order to determine whether the poor condition of the river causes a drop in neighboring property values, the Delta Institute collected data on home replacement values from the Calumet Township Assessor's Office. With relatively few sales to draw upon, the Assessor's Office uses the cost approach to estimate property values. The cost approach to property value assessment is one of three standard approaches for estimating property values, the others being the sales comparison approach and the income approach. Of the three methods, the cost approach is the best suited for this neighborhood. Unlike the sales comparison approach, it does not require information on recent sales of similar houses – a significant advantage in an area with few sales. In this neighborhood with many owner-occupied homes, the cost approach is also preferable to the income approach, which as its name implies is best suited to income-producing properties.

Homes are assessed by calculating the cost of replacing the house in an equivalent, new condition. This figure is then adjusted for accrued depreciation. Then the value of land is added to the assessed value to determine the total value of the property. The value of land is estimated by analyzing sales of vacant lots in the area. Usually, the land value estimate is the weakness of the cost approach because there often are few sales of vacant lots in established communities. However, Gary has many vacant lots – an otherwise unfortunate circumstance which increases the quality of land value

assessments. The approach used by the Calumet Township Assessor's Office is clearly the best method for assessing properties in this neighborhood. However, assessments would be more accurate if there were many sales of comparable properties in the area: comparable sales provide information that is used to improve the accuracy of the estimates of depreciation that is a critical component of the cost approach to property assessment. With few home sales in the Ambridge-Mann neighborhood, it is important to verify the accuracy of the assessments through other sources. U.S. Census data suggest that home values are higher on average than indicated by the Calumet Township Assessor's Office. In this neighborhood, U.S. Census data from 2000 indicate median home MARKET values of approximately $39,000. We use this median value as our base for calculating total homes values in the Ambridge-Mann neighborhood.

The Delta Institute collected assessment data on every home and vacant lot in the area most likely to be adversely affected by the Grand Calumet River. The locations are shown in Figure 1. The central point of downtown Gary is the intersection of 5th Avenue and Broadway, which is near the eastern edge of the map. It is important to note that the river crosses the I-90 tollway west of downtown Gary. From downtown Gary to the east, the river is north of both the tollway and a large area of railroad tracks. To the west of the area shown in Figure 1, the river flows through industrial land. Thus, the homes shown in Figure 1 are the ones that currently are negatively affected by the river, which means that these residents are the ones most likely to directly benefit from the cleanup operation.

The sample area runs from the Grand Calumet River on the north to 5th Avenue on the south. We chose to limit the sample area to homes north of 5th Avenue for two

reasons. First, the negative effects of a polluted river are expected to be confined to a fairly small area in the immediate vicinity of the river. The area north of 5th Avenue is a fairly homogeneous community, and residents in this area clearly think of the river as a factor affecting their neighborhood. A busy street, 5th Avenue forms a natural boundary with neighborhoods to the south. Beyond this point, it is unlikely that the river will have much additional effect. The second reason for limiting the sample is that data collection is costly and 5th Avenue is a reasonable sample boundary. The area shown in Figure 1 is the one most likely to be adversely affected by the Grand Calumet River.

The sample area shown in Figure 1 divides naturally into a set of four-block increments running from south to north. The first set of blocks is between 4th and 5th Avenue. With at least three blocks between these homes and the river, it is unlikely that the river will have a significant effect on house prices. The next set of blocks lies between 4th Avenue and the South Shore line, which runs between 2nd and 3rd Avenue. By the next set of blocks, between the South Shore line and 2nd Avenue, the river is clearly close enough to have a significant effect. Finally, in the small area north of 2nd Avenue, the river is virtually at the doorstep.

When analyzing values of homes, the area between 4th and 5th Avenue forms the base. Statistically, there is no significant difference between the two blocks lying between 4th Avenue on the south and 2nd Avenue on the north. But as expected, the blocks north of 2nd Avenue are the area most adversely affected by the river. For vacant lots, the statistical structure is a bit different. For this sample, the blocks between 3rd Avenue and the river can be treated as one, with blocks between 3rd and 5th Avenues forming the base for vacant lots.

Descriptive statistics for the sample of single-family homes are presented in Table 1. The average home replacement value – the cost of rebuilding the home to its current condition, taking into account depreciation – is $15,820. However, values are much lower near the river, averaging $13,279 north of 2nd Avenue and $15,355 between 2nd and 4th Avenues. Of course, it is possible that this difference in average replacement values is explained by a lower quality of housing near the river. To control for these differences, the hedonic approach includes housing characteristics as explanatory variables in a regression with house values as the dependent variable. Explanatory variables that proved statistically significant are shown in Table 1. These variables include lot depth (measured in feet), total lot size (measured in acres), the number of bathrooms, a dummy variable indicating that the house has air conditioning, the total size of the house (measured in square feet), and a series of variables indicating the decade during which the home was constructed. No homes in this neighborhood were constructed after the 1950s.

The average lot size is 0.13 acres, and it is about 134 feet deep. Most homes have a single bathroom. About 36% have air conditioning. Homes average about 1200 square feet. Most homes were built either in the 1940s or before 1920. Homes directly adjacent to the river tend to be a bit smaller than in other locations, with somewhat deeper lots. Although homes between 2nd and 4th Avenues tend to be newer on average than homes between 4th and 5th, there do not appear to be significant differences between the housing in these locations. The fact that houses do not vary substantially in physical characteristics while assessments are lower nearer the river strongly suggests that the river has an adverse effect on property values.

Table 2 presents descriptive statistics for the sample of vacant lots. Naturally, no data are available for anything but location and the lot size and shape when no home exists on the lot. Lots tend to be higher priced near the river – $1143 north of 3rd Avenue versus $1032 to the south. However, they also tend to be larger nearer the river. The average lot size is 0.12 acres near the river versus 0.10 farther away. Lots are also deeper near the river – 133 feet versus 129 feet on average. Regression results, to be presented next, show again that the river leads to a reduction in lot prices after controlling for the depth and total size of the lots.

Replacement value, again, is the cost of rebuilding the home to its current condition with depreciation factored in, whereas market value is the price at which the home would be expected to sell. Typically, these values are about the same. However, the average assessed replacement value recorded at the Calumet Township assessor's office of $15,820, or approximately $16,000, is significantly lower than the U.S. Census median market value for homes in the Ambridge-Mann community of $39,000. This is likely due to the fact that Indiana has been one of only two states that did not base assessments on market value. In June 2002, the Indiana General Assembly passed a tax restructuring bill. The reassessment was supposed to be finished by March 1, 2002 but as of April 2003 the reassessment had not been completed. Until the passing of the tax restructuring bill in 2002, houses were assessed based on the cost of replacing the house at 1991 construction costs. Depreciation was subtracted based on the age of the home. There were also adjustments for condition, neighborhood quality and other factors (SOURCE: PURDUE COOPERATIVE EXTENTION SERVICE. PURDUE UNIVERSITY AGRICULTURAL ECONOMICS DEPARTMENT WEBPAGE). The replacement value recorded at the Calumet Township Assessor's Office is much lower than the market value of those same homes. A check of

recent home listing on the web site www.realtor.com suggests that the higher value is much more accurate. In calculating estimates of the economic benefits of the Grand Calumet River Remediation Project, we apply an adjustment factor of 39000/16000 = 2.4375 to assessed values to ensure that our estimates are accurate.

4. Regression Results

The regression results for single-family homes are presented in Table 3. The dependent variable is the natural logarithm of total assessed value per square foot of building area. Thus, the coefficients show the percentage change in the price per square foot caused by a one-unit change in the explanatory variables. The regression is estimated using a subset of the full sample of homes. For these 607 homes, data are available for all of the explanatory variables. The R^2 indicates that a highly respectable 63.2% of the variation in homes values is accounted for by the explanatory variables. All of the explanatory variables add significant explanatory power to the regression.

The regression results accord with expectations. Controlling for overall lot size, each additional foot of depth reduces the per square foot value by 0.4%. Thus, long narrow lots are worth less than lots with more street frontage. Each additional tenth of an acre increases the unit value by 30.5%. An additional bathroom increases the price per square foot by 8.2%. Air conditioning adds 6% to the unit price. The price per square foot falls with square footage. However, the coefficient of -0.642 implies that each additional 10% of building area raises total value by about 3.6%. Homes built before 1920 have higher values than older homes, with the 1940s being the most valued vintage.

The most important results for our purposes are the coefficients for the variables indicating the location of the home relative to the river. The base home is between 4th and 5th Avenues, four blocks from the river. Controlling for other characteristics, homes between 2nd and 4th Avenues – homes one or two blocks closer to the river – cost 17.8% less per square foot than the most distant homes. Homes directly adjacent to the river are worth 27% less per square foot than the most distant homes, which implies that a home next to the river costs 9.2% less per square foot than a home between 2nd and 4th Avenues. These results are exactly as expected if the Grand Calumet River is viewed as a significant detriment to the neighborhood. Even after controlling for lot size, house size, age, the number of bedrooms, and the presence of air conditioning, the value of homes rises with distance from the river.

Similar but less dramatic results are found in Table 4 for vacant lots. The dependent variable for this regression is the natural logarithm of total assessed land value per square foot of lot area. All 237 vacant lots in the sample are used in this regression. Again, all the explanatory variables add significant explanatory power. The regression accounts for an impressive 86.9% of the variation in vacant lot values.

The estimates imply that the price per square foot falls at a decreasing rate with lot size. Although larger lots still have higher total values than small lots, an additional square foot of lot size adds more to larger lots. The coefficient for lot depth indicates that narrow lots are worth less than lots with more street frontage: controlling for total acreage, each additional foot of lot depth reduces per square foot vacant land prices by 0.8%.

The most important results are for the variable representing a location in the two blocks between 3rd Avenue and the river. Vacant lots in these blocks are worth 4% less per square foot than lots in the two more distant blocks. This result is particularly significant because the lots are vacant, leaving nothing but location as a factor accounting for price differences. A polluted river reduces the price of empty yards as well as the price of existing homes.

5. The Economic Benefits of the Remediation Project

Calculating the economic benefits of the remediation project is straightforward using the results of the estimated regressions. The estimated equations can be written as $\ln(V/A) = X\beta + \alpha D + u$, where V represents total value, A is area (building area for homes and lot size for vacant lots), X is a vector of explanatory variables, and D is a dummy variable representing location. This equation can be rewritten as $\ln V = \ln A + X\beta + \alpha D + u$. Thus, changing D from 0 to 1 changes values by $100\alpha\%$: $\Delta V = \alpha V$. This estimate is then adjusted upward by a factor of 2.4375 to adjust for the systematic under-assessment of replacement values.

The estimates presented in Table 3 imply that home values along the Grand Calumet River are 27% lower than homes four blocks away from the river. Home values between 2nd and 4th Avenues are 17.8% lower than homes between 4th and 5th Avenues. These estimates control for other housing characteristics such as age, size, and lot area. Therefore, it is reasonable to assume that the current polluted state of the river has led to these discounts. Apart from any direct benefits created by further neighborhood

improvements along the river, the dredging plan will make the neighborhood better off simply by eliminating its current negative effects on home values.

Altogether, there are 841 homes between 2nd and 4th Avenues. Sufficient data to be included in the Table 3 regression were available for 419 of these homes. We can estimate the change in aggregate homes values in this area using all 841 homes because our estimate, $\Delta V = 0.178Vx2.4375$ only requires information on the initial home value. The average replacement value of these 841 homes is $15,079. Thus, the predicted change in total market value after the river cleanup is $6,542. Across 841 homes, the total change in value is $5,501,822, or about $5.5 million. Another 48 homes are located directly adjacent to the river. The average replacement value of these homes is $13,279. The predicted change in total market value for the average home after the river cleanup is 0.27x13,279x2.4375 = $8,739. Across 48 homes, the total change in value is $419,484. Together, these estimates imply that home values near the Grand Calumet River will increase by $5,921,306 after the dredging plan is complete.

To put this figure in perspective, note that altogether there are 1,043 homes in the area between 5th Avenue and the Grand Calumet River. The average assessed replacement value of these homes is $15,542. Thus, the total market value of all homes in this area is $39,512,621. Our prediction implies that the total value of homes in the area between 5th Avenue and the Grand Calumet River will increase by 15.0% after the cleanup.

Vacant lots are also expected to increase in value. The estimates presented in Table 4 imply that the value of a vacant lot within two blocks of the river is 4% lower than a lot between 3rd and 5th Avenues. The average assessed value for a vacant lot

between 3rd Avenue and the river is $1,143. Using the same adjustment factor of 2.4375 as for house values, the average market value of a vacant lot is $2,786. Across the 84 vacant lots in this area, the 4% discount translates into a total change in value of $9,361. Combined with the existing homes, our prediction is that prices will increase by $5,930,667 after the cleanup.

These estimates are conservative. First, they are based on an assumption that the negative effect of the river ends by 5th Avenue. The estimated benefits are understated if the effect of the river continues farther south. *Second, they do not take into account potential improvements undertaken after the dredging plan is complete*. If walkways and parks are constructed, if the river again is used for fishing and other recreational activities, then all homes in this area may well increase in value far beyond the estimated value of $5.93 million. Indeed, all homes within the City of Gary may become more valuable if new plans for the river succeed in making the entire city a better place to live. Nevertheless, $5.93 million is an impressive amount, and it only requires that the dredging plan succeed in removing the discount associated with living near the river. *Further improvements can produce significantly larger increases*.

6. Conclusion

The Grand Calumet River Remediation Project is a massive undertaking. At a cost to U.S. Steel of $41 million, the long-suffering river will be cleaned-up and restored, with new vegetation and parkland along its shore. With a location close to the commercial district of Gary and an established residential neighborhood, it has the potential to be an important resource to the residents of Gary.

Past years of abuse left the Grand Calumet River a dangerous eyesore. This report documents the effect of this abuse on home prices in a neighboring residential area. A basic tenet of economic theory is that people will only live near an unpleasant and dangerous site if they receive a discount in their rent or home price. We find that this discount amounts to 27% of home values for houses in the block adjacent to the river, or an average total value of $8,739. The discount drops to a still substantial figure of 17.8% of home values for houses in blocks two or three blocks from the river. For these homes, the average discount is $6,542. Vacant lots also are affected. We find that the value of vacant lots is 4% lower in the two blocks nearest the river, or $111 on average.

When added up across all homes near the river, these discounts translate into large numbers. The discount for the 48 homes directly adjacent to the river adds up to $419,484. For homes two or three blocks from the river, the total discount is $5,501,822. Adding another $9,361 for vacant lots, we find that the discount associated with locations near the river totals $5,930,667.

At a minimum, this discount should disappear after the cleanup. There no longer will be a reason to avoid living near the river. Thus, even if nothing further is done to improve the condition of areas along the river, we should expect to see an increase of about $5.93 million in the value of homes in Gary as a result of the Grand Calumet Dredging Plan.

Further increases in prices will be enjoyed if, as expected, steps are taken to make the river useful and attractive. Part of the plan includes the restoration of fish to the river. U.S. Steel will deed 32 adjacent acres of land to the National Park Service. With new parkland, fishing, and canoeing easily accessible to residents, home prices will rise still

more as the neighborhood becomes a more attractive place to live. Flowing next to downtown Gary, the river also is accessible to all the citizens of Gary. New walkways, bike paths, fishing, and parks will be available to everyone in Gary. With well-chosen improvements, all homes in Gary may increase somewhat in value as a result of a revitalized river. Even small increases in home values amount to large figures when summed over a full city. And if new construction is attracted to the many vacant lots near the river, aggregate benefits may rise far beyond our $5.93 million estimate.

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Table 1

Descriptive Statistics
Homes Used In Regression Analysis

Variable	All Homes (607 obs.)	4th – 5th Ave (140 obs.)	2nd – 4th Ave (419 obs.)	2nd Ave – River (48 obs.)
Assessment	15820.43 (5759.01) [800, 97000]	18083.57 (6021.41) [7500, 56400]	15355.37 (5601.62) [800, 97000]	13279.17 (4190.21) [2300, 22300]
Lot Depth	133.56 (16.38) [102, 302]	135.04 (12.78) [102, 168]	132.27 (17.62) [105, 320]	140.52 (12.03) [125, 154]
Acreage	0.13 (0.04) [0.04, 0.51]	0.13 (0.04) [.04, 0.36]	0.13 (0.04) [0.04, 0.51]	0.13 (0.05) [0.05, 0.31]
Bathrooms	1.17 (0.38) [1, 3]	1.23 (0.40) [1, 2.5]	1.16 (0.36) [1, 3]	1.18 (0.48) [1, 3]
Air Conditioning	36.2%	38.6%	36.5%	27.1%
Building Area	1193.90 (455.59) [667, 2986]	1285.88 (483.41) [750, 2858]	1171.50 (441.64) [667, 2986]	1121.12 (464.08) [720, 2176]
Built before 1920	22.7%	20.0%	22.4%	33.3%
Built in 1920s	12.5%	22.1%	10.3%	4.2%
Built in 1930s	13.3%	29.3%	9.1%	4.2%
Built in 1940s	45.8%	28.6%	50.4%	56.2%
Built in 1950s	5.6%	0.0%	7.9%	2.1%

Note. Standard deviations are in parentheses below the sample averages. Ranges are shown in brackets.

Table 2

Descriptive Statistics
Vacant Lots Used in Regression Analysis

Variable	All Lots (237 Obs.)	3rd Ave – 5th Ave (153 Obs.)	3rd Ave – River (84 Obs.)
Assessment	1071.31 (424.89) [200, 3300]	1032.03 (390.12) [200, 3300]	1142.86 (476.00) [200, 2800]
Lot Depth	130.35 (13.66) [28, 150]	128.84 (13.40) [28, 150]	133.11 (13.77) [82, 150]
Acreage	0.11 (0.04) [0.02, 0.26]	0.10 (0.03) [0.02, 0.22]	0.12 (0.05) [0.02, 0.26]

Note. Standard deviations are in parentheses below the sample averages. Ranges are shown in brackets.

Table 3

Regression Results
Assessed Home Values

Variable	Coefficient	Standard Error	*T*-Value
Lot Depth	-0.004	0.001	-5.160
Acreage/10	0.305	0.031	9.889
Bathrooms	0.082	0.031	2.622
Air Conditioning	0.060	0.023	2.676
Ln Building Area	-0.642	0.040	-16.187
Built in 1920s	0.113	0.039	2.931
Built in 1930s	0.231	0.042	5.504
Built in 1940s	0.354	0.034	10.487
Built in 1950s	0.203	0.054	3.739
2^{nd} – 4^{th} Ave	-0.178	0.027	-6.627
2^{nd} Ave – River	-0.270	0.045	-6.050
Constant	7.080	0.300	23.632
$R^2 = 0.632$,	Number of Observations = 607		

Note. The dependent variable is the natural logarithm of total assessed value per square foot of building area.

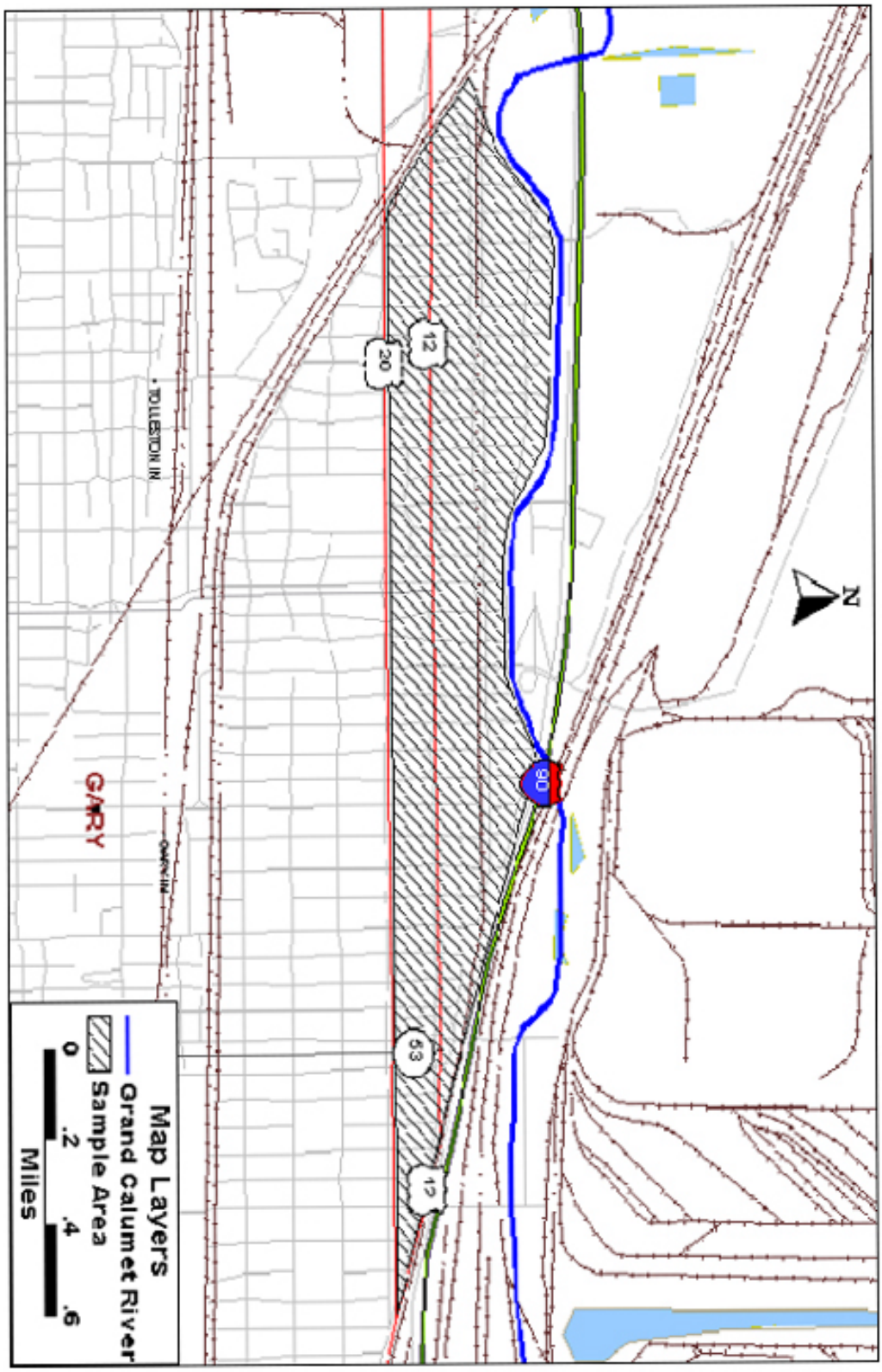
Table 4

Regression Results
Assessed Lot Values

Variable	Coefficient	Standard Error	*T*-Value
Lot Depth	-0.008	0.001	-10.180
Acreage/10	2.119	0.100	21.137
$(\text{Acreage}/10)^2$	-4.552	0.365	-12.480
3^{rd} Ave – River	-0.040	0.020	-2.045
Constant	6.227	0.094	66.460
$R^2 = 0.869$,	Number of Observations = 237		

Note. The dependent variable is the natural logarithm of total land value per square foot of lot area.

Figure 1
Sample Area



This report is a part of a larger project known as the GARY RIVERFRONT REVIVAL: A MODEL REDEVELOPMENT PLAN. The Delta Institute, as coordinator of this U.S. EPA-funded project, is creating a community involvement and planning process that will result in a conceptual master plan for sustainable riverfront redevelopment along a five-mile stretch of the East Branch of the Grand Calumet River in Gary. The purpose of the plan is to optimize the economic benefits of sediment remediation along the five-mile stretch of the Grand Calumet River that U.S. Steel Gary Works is in the process of dredging and restoring at the time of the publication of this report.

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