

Regional Economic Impact Study of the Lake Delhi Watershed Area

Prepared by the
Lake Delhi Watershed Committee

October 8, 2010

EXECUTIVE SUMMARY

Scope

This analysis was performed to determine the economic impact that Lake Delhi residents had on the regional economy prior to the flooding disaster and dam breach of July 24, 2010 and the probable economic impacts (negative and positive) post flood and dam breach. The study is partially based on a survey of Lake Delhi residents and was structured to provide information about spending directly attributable to Lake Delhi prior to the dam breach and expected spending subsequent to the breach until such time as the lake is restored. We also gathered information about guest visits before and after the flood event. Additionally, we asked each survey respondent to provide the expected value of major property repair, replacement, and improvements planned or required in the event the lake was restored. At the time of this report, we have received and processed 162 surveys from the approximately 850 homes on the Lake. The sample size represents a 19% response rate.

In addition to the surveys, we also studied the economic impact of the flood and breach event on assessed property values on the Lake and its impact on property tax revenues derived from the Lake Delhi area tax base.

This study does NOT include other significant direct regional economic impacts from the following sources:

1. Public use of the Public Lake and Waterways by the general public for fishing, boating, camping, snowmobiling, etc.
2. Commercial and Real Estate Development activities related directly to Lake Delhi. There were several large (multi-million dollar) projects in the planning and development stages at the time of the breach event that have been cancelled or put on hold until the lake is restored.
3. Expenses incurred to support infrastructure expenses for repairs, improvements and replacements by government entities.
4. Economic impact of the actual reconstruction of the dam, spillway, and other related components to restore Lake Delhi to its original state as a Lake.

There will also be a significant negative impact on the sales tax and local option sales tax generated by the economic impact of the Lake Delhi area disaster. This report does not attempt to quantify the negative impact but

nevertheless it does exist and should be considered in the total economic impact of the region.

The economic impact of this report does not address the likely impact on employment within the region. It is however, reasonable to conclude that the positive or negative economy-wide impacts will have a direct and lasting effect on employment. That correlation is very easy to see in the reconstruction, repair, and replacement of damaged property as well as the impact on local businesses that depend partially or heavily on the Lake Delhi area residents as customers for their businesses. Because a majority of the residents are seasonal, the survey results indicate a very strong decline in their presence at and around the Lake Delhi area.

This study also accounts for the additional economic effect of money spent (or not spent) and its total economy-wide impact, commonly known as a multiplier. For each dollar spent, a chain reaction of economic events is triggered. The initial stimulus of new spending sets into motion a series of additional spending and re-spending activities. As stated by David Kay, a Senior Extension Associate at Cornell University, "Multipliers are used with the presumption that, in a precise mirror image of an increase, any decrease in existing spending sets into motion a whole series of spending contractions." Simply stated, multipliers have the same effect on the economic impact regardless of the positive or negative impact of the spending. A multiplier of seven has been used in this report. Further detail on the determination of the multiplier used in this study is discussed later in this report.

Prior to the beginning of this study, Dave Swenson, an economics professor at Iowa State University, was contacted to gain insights into the proper approach to a study of this nature. His recently released study on the "Economic Outcomes of the 2008 Iowa Weather – Related Disaster" was also considered in this report preparation.

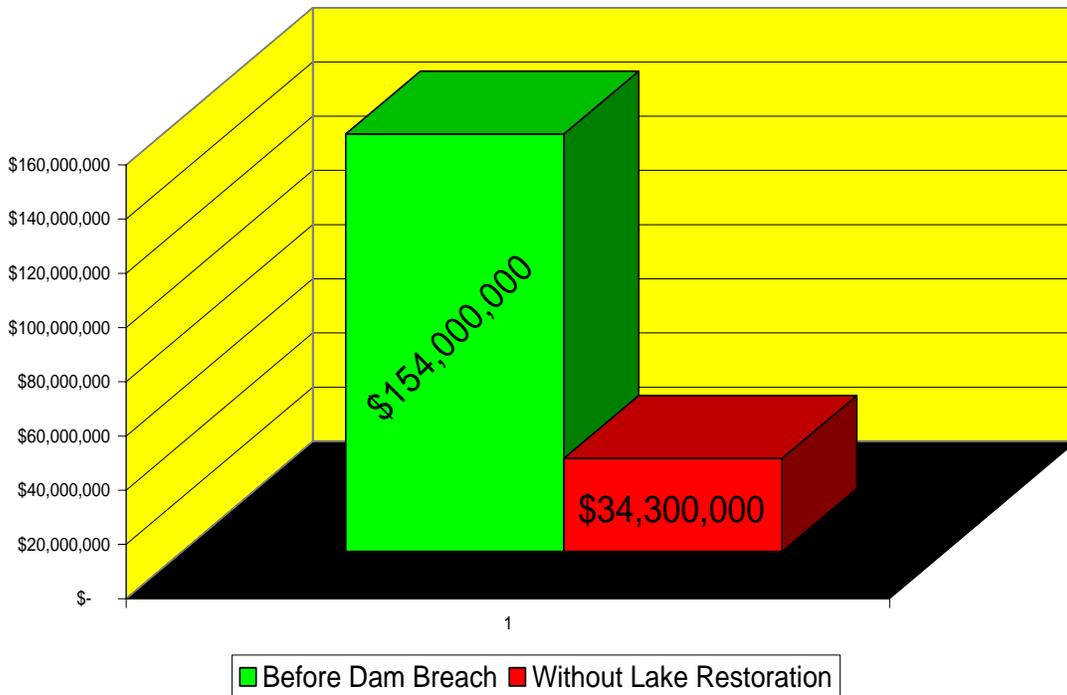
SUMMARY OF RESULTS

\$120 Million a Year Negative Regional Economic Impact

The combined results of the resident surveys and property tax analysis show the estimated annual regional economic impact of the Lake Delhi area to be \$154 million before the flood and breach event. The data also shows that a very significant negative impact will be made on the region, subsequent to

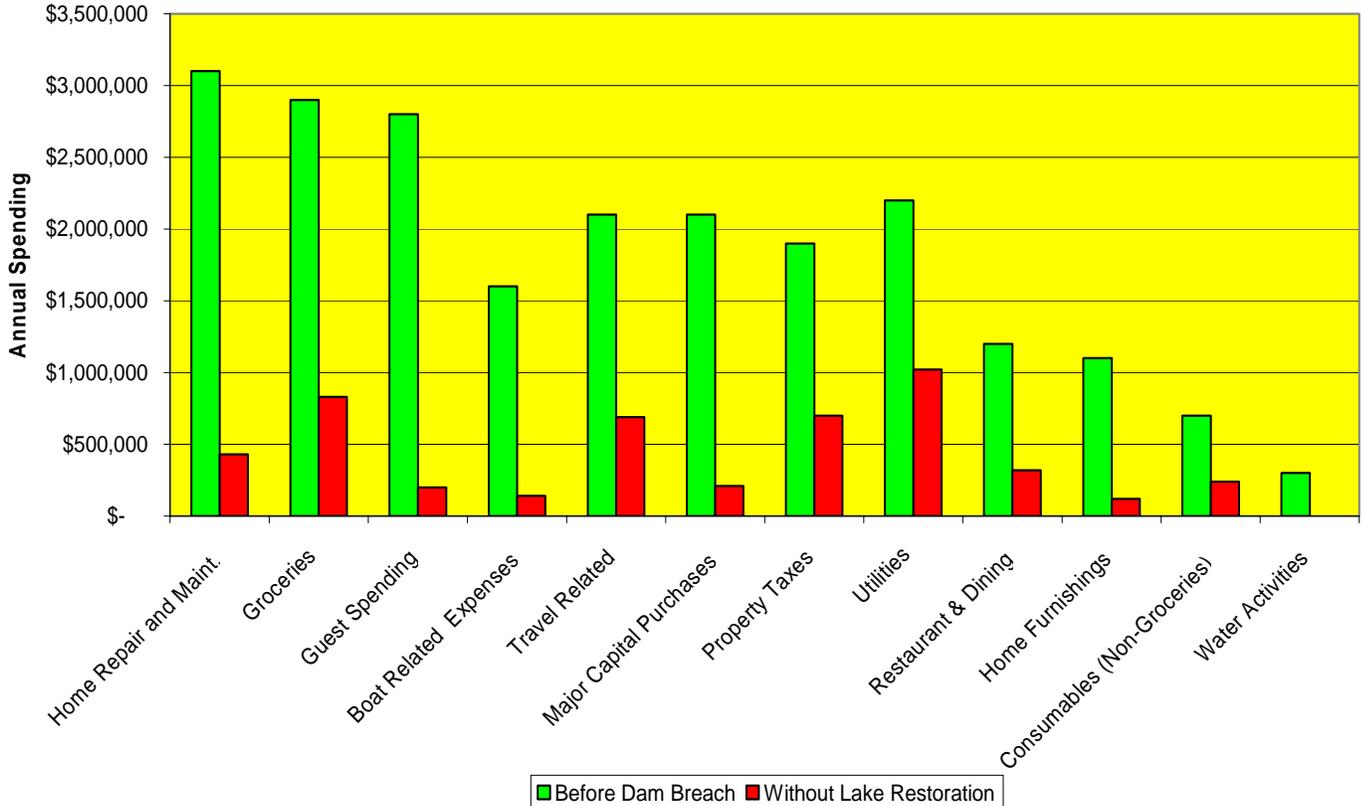
the flood as the projected economic impact will drop to \$34 million until the Lake area is restored to its original state. The net negative economic impact will be \$120 million a year, as is shown in the following chart. Survey results also indicate that many residents will leave the region if the Lake is not restored and future plans for further development of properties by remaining residents will drop sharply.

Annual Economic Impact by Residents of the Lake Delhi Region



The following chart reflects the survey respondent's break down of annual lake spending by category for each of the two conditions. The chart reflects the sharp drop in spending across all categories.

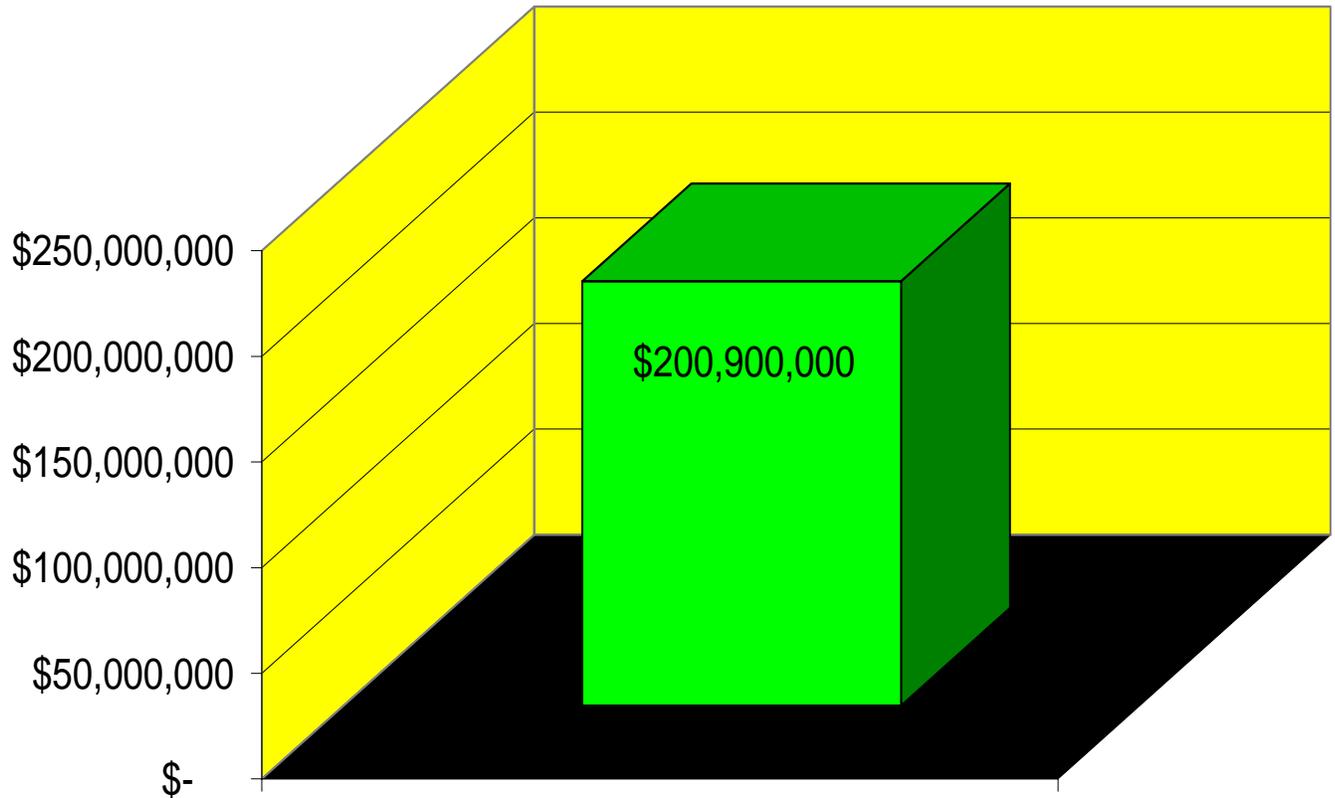
Lake Delhi Residents Annual Spending Before Dam Breach vs. Without Lake Restoration



\$201 Million Secondary Economic Infusion with Lake Restoration

The resident surveys also asked the respondents to provide the approximate amount of money they would spend repairing, replacing and improving their homes/cabins, shorelines, boats, docks, and boat lifts if they knew Lake Delhi was definitely going to be restored in a relatively short timeframe. The average respondent expected to spend \$34,000 for these items given that condition of the lake was restored quickly. Applying the sample size to the entire population and factoring in the total economy-wide effect of the one-time stimulus spending, the economic impact of this spending would be \$201 million. See the following chart.

Economic Impact of Resident Reconstruction and Improvements with Lake Restoration

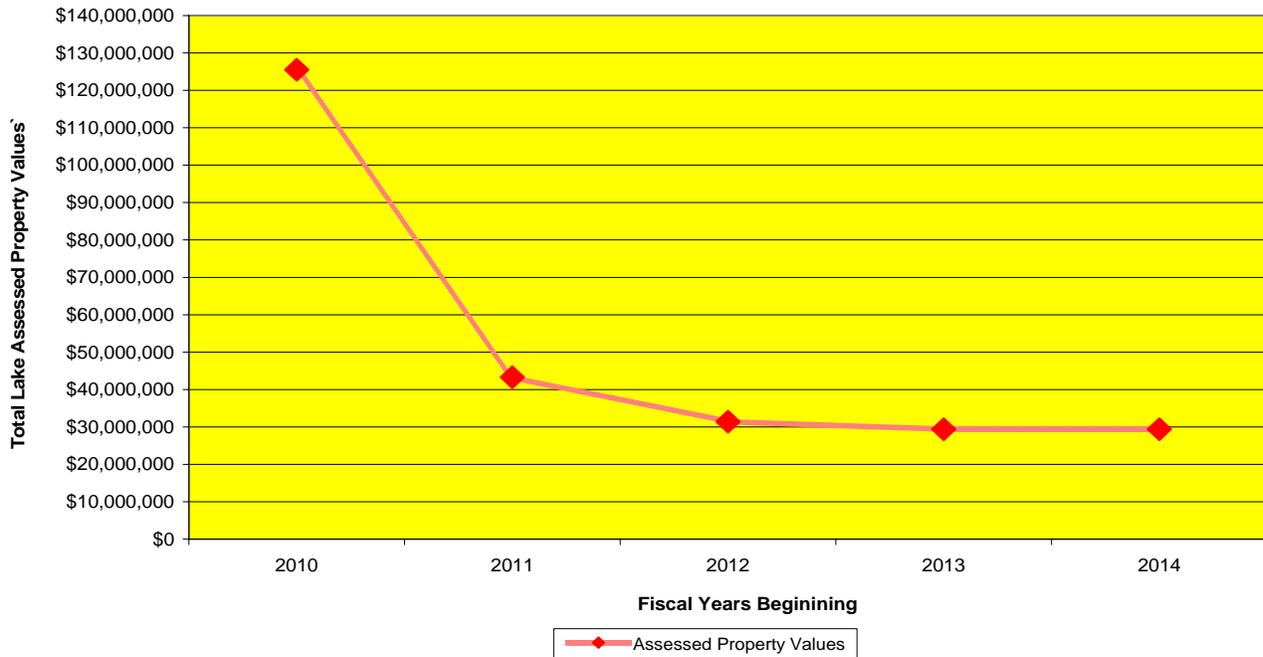


\$1.2 Million Annual Negative Economic Impact on Property Tax Revenues

The impact of the flood on the Lake Delhi Tax District and other adjacent areas will be extremely significant. Due to the magnitude and immediate nature of this catastrophic event, the impact on assessed values and property tax revenues generated by the area will be initially severe and get worse as time goes on. State mandated changes to land will decrease assessed values by 80%. Those decreases will also have a very large negative impact on building assessed values. If the Lake is not restored quickly, the resulting distressed market will continue to force values down substantially in following years. The report projects the disaster impact on tax revenues to decrease by an average of \$1.2 million. Post-disaster sales data is very

limited, but early post-disaster actual sale data supports the conclusion of a drastic and immediate drop in property values. This report projects 2011 assessed values that are more conservative than sales data at the time of this report. A copy of the impact on property values and taxes has been included with this report (Page 17 - Attachment A).

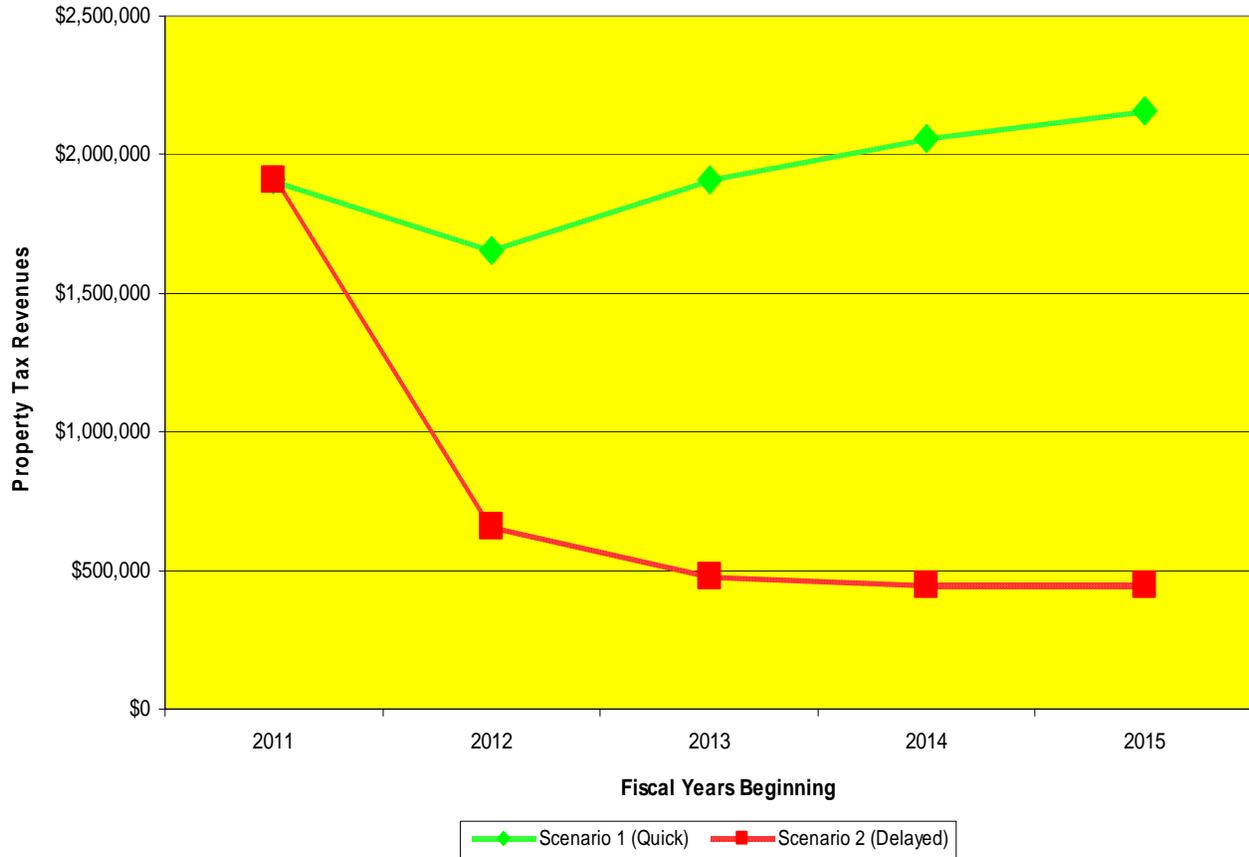
Assessed Property Values without Lake Delhi Watershed Restoration



Positive Impact on Property Tax Revenues Given a Quick Lake Restoration

Conversely we also analyzed the impact on property taxes from the area to determine the impact if the Lake was restored quickly. Delaware County and Maquoketa Valley School District will be forced to decrease budgets or pass the loss of taxes back to tax payers by increasing tax levies to compensate for the loss in tax revenues. Either way, the economy-wide impact will be the same on the region. The Lake Delhi Taxing District currently accounts for roughly \$800,000 (21%) of the Maquoketa Valley annual property tax revenue. It also is projected to be \$1,908,000 (9%) of the Delaware County total annual property tax revenues based on 2010 Assessed Values. The next chart shows the very distinct impact the two different scenarios would have on property tax revenues from the Lake Delhi Tax District.

Comparative Tax Revenues of Quick vs. Delayed Restoration of Lake Delhi Watershed



Conclusion

The Lake Delhi Watershed area does (and will continue to) have a very significant economic impact on the region. Given the large amount of uninsured losses and inability for most residents to qualify for FEMA assistance, this negative economic impact will be almost as sudden and drastic as the flood and dam breach event was originally to the region. The impacts presented in this study are only a part of a total larger impact when added to the other areas not included in this report. Commercial and Real Estate development in the Lake Delhi area will be substantially impacted, only compounding the negative impacts presented in this study. A quick and coordinated effort to restore the Lake, will mitigate the economic damage and will likely promote the quick return to the vibrant economic impact and growth the Lake Delhi Watershed Area has historically produced for the region.

SUPPORTING INFORMATION

Introduction

A survey of the Lake Delhi residents was conducted to determine the spending impact of the area in both a pre-disaster situation and a post-disaster situation. In the post-disaster scenario, surveys asked to respond with the assumption that Lake Delhi would NOT be restored to a Lake. This approach would allow the study to measure the Lake Delhi resident's economic-wide impact on the region given the current status of the area and how it will impact the region until such time as the Lake is restored. Surveys were made available to all Lake Delhi residents in a number of ways. Email distribution lists, web sites, face book page postings, visiting to local area functions to hand out surveys to attendees, etc. Several electronic requests were made to residents to print out surveys and give them to neighbors and friends that may not access email and other forms of electronic communication. Completed survey responses were received by email, mail, fax and hand delivery. Surveys responses were compiled in data base to determine that no duplicate responses were processed as well as process the data into meaningful information for the presentation in this report. All respondents were asked to provide their name and address on the survey so we could eliminate any duplicates. Surveys without name and address information were not included to avoid any potential duplication. All surveys were logged, assigned a tracking number and filed for future reference. At the time of this report there have been 162 surveys logged and processed out of approximately 850 residential dwelling on the Lake.

No attempts were made to survey people that use the Lake that are not tied to a resident of the Lake. The process of attempting to gather that information was going to be difficult to obtain and verify for validity. Time and resources were limiting factors in this decision as a valid survey process would likely require a process to identify those users and then subsequently try to contact them for information.

Information about impacts by Commercial and Real Estate Development initiatives related to the lake are also difficult to determine as extrapolate into a study of this nature. Excluding those activities from this study will make the information presented more conservative, but should not be

completely factored out of any potential impact analysis as decisions are made on the funding and future status of the Lake.

It is important to realize the Lake Delhi residents were also asked (in addition to their normal spending histories and future intentions) to quantify the expected value of major property repair, replacement, and improvements planned or required in the event the lake was restored. Those responses were compiled to determine the potential “Secondary Stimulus/Infusion” that would occur if the Lake were to be restored quickly. This “Secondary” economic impact would be in addition to the impacts calculated for an ongoing annual economy-wide impact in the first part of the survey. The results of “Secondary Infusion” data, was very substantial (\$201 million) and provides a strong indication as to the amount of damage incurred by Lake area residents in the flood and dam breach disaster. Given the large population of residents that do NOT have a primary residence at the lake (a primary qualifying factor for FEMA and other related public assistance), and could not get flood insurance (because the county did not elect to participate in the national flood insurance program) this may be the closest real estimate as to the extent of the damage incurred by Lake Residents. Perhaps more importantly, will have to “pay for out of their own pocket” as public assistance and insurance reimbursement will be limited for the reasons previously listed.

The second half of the study focused on the impact on Property Values of the area after the disaster. Detailed property level information was obtained from the Delaware County Assessors Office. Several discussions took place with the Assessor to understand the potential impacts this would have on Assessed Property Values in the Lake Delhi Tax District and the related impact on Property Tax Revenues generated by the Lake Delhi Area. A detailed report of those findings is included later in this report.

Multiplier Determination

Definition and Explanation of the Multiplier Effect on Economic Impacts

The following information was obtained from an article written by David Kay, a Senior Extension Associate at Cornell University. The article is titled “Economic Multipliers and Local Economic Impact Analysis” (December 2002):

A multiplier is an empirical, quantified measurement of the strength of the economic linkages between a given industry or economic sector and the rest of the regional economy. The greater the extent of the linkages, the greater the size of the multiplier. The greater the multiplier, the greater the economy-wide dollar impact of any given stimulus.

There are at least three key concepts that must be analyzed to determine most multipliers. The first is the concept of an economic stimulus through a change in final demand. The second is the notion of a chain of spending and re-spending that is set into motion by an initial economic stimulus. The third is the notion of "leakage" from a local economy.

"Final demand" refers to the sales of economic goods and services to purchasers who are the ultimate users or consumers of these products. The demand is "final" as opposed to "intermediate". In other words, the goods and services are valued in and of themselves rather than for their usefulness in the economic production of new goods and services. When final demand increases, a kind of chain reaction of economic events is triggered. The initial stimulus of new spending sets into motion a series of additional spending and re-spending activities. Most multipliers are used with the presumption that, in a precise mirror image of an increase, any decrease in existing final demand (decrease in ultimate consumer spending) sets into motion a whole series of spending contractions.

This cycle of spending and re-spending seems like it might continue without end. However, this is not the case. The reason can be summarized in the term "leakage". Leakage represents the dollars that are withdrawn from the re-spending cycle.

Insofar as they are not re-spent, the withdrawn dollars cannot stimulate further purchases. Starting right at the very first round of spending associated with an increase in final demand, and continuing in all subsequent rounds, a certain portion of the dollars will "leak" out of the economy. Because of leakage, at each round of spending and re-spending, the dollar amount re-spent diminishes. The amount that it diminishes is usually averaged across the entire process.

A small amount of leakage may indeed end up in a cookie jar or under someone's mattress. However, leakage more importantly is associated with other sources including:

- other forms of long term saving and nonlocal investment
- increased tax payments
- spending on goods and services that are not produced locally, (e.g. domestic and foreign imports)

While it is true that some of what is termed leakage here may eventually be re-spent locally, this is not likely to be immediate or automatic. If such spending does occur, it would generally be considered a new increase in final demand.

A single city or county, especially in a rural area, is much more likely to experience high levels of leakage. This is because, compared to a state or nation, most "small" economies are more dependent on the need to buy many goods and services produced outside its boundaries. For this reason, it is nearly always but not necessarily true that multipliers for small geographic areas are smaller than for larger ones.

Determination of the Multiplier Effect in this Report

After researching the multiplier information and applying the principles learned from that research we considered the following criteria in determining an appropriate multiplier to the data in this report:

- The initial economic impact through a change in final demand. In the case of this report, the impacts were calculated by on data obtained from surveys and our analysis of the impact on future tax revenues caused by the dam breach event and flood damage to property.
- The proximity of the "Final Demand" spending for goods and services by purchasers who are the ultimate users or consumers of the products. Our impact data is based on information from Lake Delhi residents who indeed are the ultimate user or consumer of the goods and services reported in our surveys.
- The "leakage" factor attributed to the size of the economy impacted by the report. This report is not limited to the scope of the impacts solely on one city or county in Iowa. Given the diverse nature of the residents (full and part-time) that own property at Lake Delhi, the geographic footprint (their place of principal residence) reaches well beyond the any one city or county in the area. The economic impact of this report is truly a regional impact that stretches well beyond those local city and county boundaries.

All of these factors point to a higher (rather than lower) multiple for the regional impact of this report. We also discussed this with several knowledgeable sources and received their input as well. Our research indicates that multiples can range anywhere from approximately 4 to 14. Although our case would indicate a higher multiple based on the facts outlined above, we chose to use a lower more normally accepted multiple of seven (7). The initial impacts determined in this report have used the more conservative seven (7) to determine the economy-wide impact.

Summary of Calculations

Below is a table of summarized calculations used to determine the economy-wide economic impact for the region.

ANNUAL SPEND IMPACTS	Expressed in Millions of \$		
	Annual Spend before	Annual Spend without Lake Restoration	Change in Annual Spend
	Dam Breach		
Annual Economic Spend by Lake Delhi Residents	\$17.3	\$4.0	(\$13.3)
Annual Impact of Property Tax Revenues	\$1.9	\$0.7	(\$1.2)
Annual Economic Impact by Guests of Residents	\$2.8	\$0.2	(\$2.6)
Total Annual Economic Impact of Initial Spending	\$22.0	\$4.9	(\$17.1)
Multiplier to Determine Economy-Wide Economic Effect	7	7	7
Grand Total Annual Economy-Wide Economic Impact	\$154.0	\$34.3	(\$119.7)

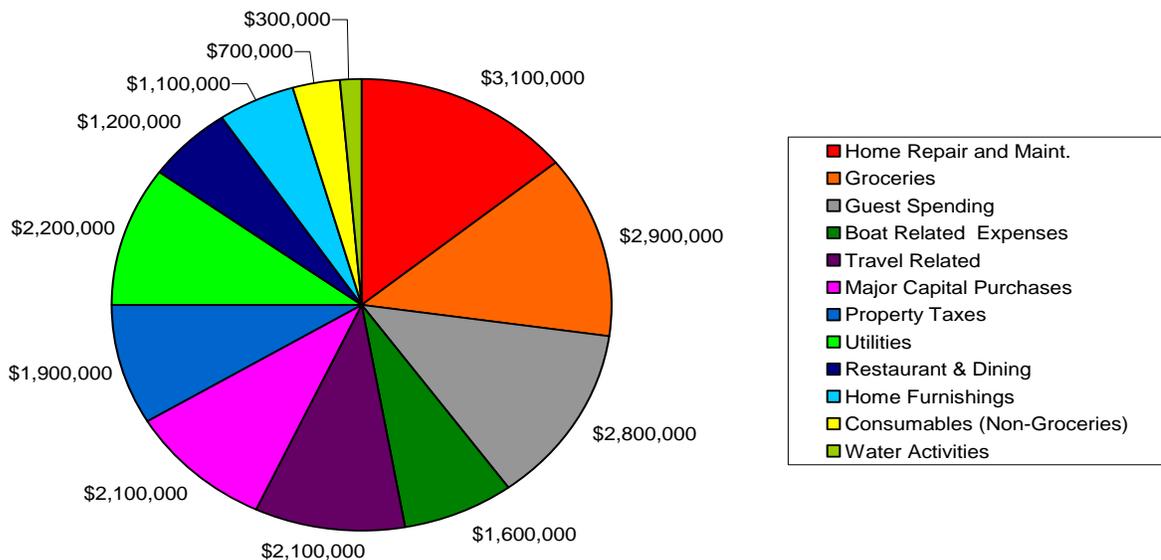
"SECONDARY INFUSION" IMPACTS
Economic Impact of "Secondary Infusion" with Lake Restoration
Multiplier to Determine Economy-Wide Economic Effect
Total Economy-Wide Economic Impact of "Secondary Infusion"

\$28.7
7
\$200.9

Detailed Breakdown of Lake Delhi Resident Spending

The chart below provides a breakdown of the Initial Annual Spend (before the application of a multiplier) to show the various categories included on the Lake Delhi resident survey and the amounts reported by respondents prior to the Lake Delhi dam breach and flood disaster.

Breakdown of Annual Economic Spending Pre-Disaster



Other Factors Considered in Economic Impact Analysis

As this report determines the Economic Impact of the dam breach and flood disaster we considered the concepts of Shifting, Offsets, and Data Availability outlined in the recently released Iowa State University study titled “Evaluating Direct and Indirect Economic Outcomes of the 2008 Iowa Weather – Related Disasters” authored by the scientist in the Department of Economics, Iowa State University. The following information is reproduced from that report:

Economic Impacts

Whether we are describing a disaster or any other disruption to the economy, there are two key interacting factors which properly translate into measurable economic impacts using traditional modeling systems. These are the annualized changes in regional household consumption, or regional industrial production. If a disaster displaces people or otherwise interferes with their abilities to obtain incomes, then regional consumption will decline. Similarly, if a disaster interferes with the capacity of a region to produce goods and services, then regional productivity will decline, which in turn depresses jobs and job-related incomes. One or both of these dimensions must be measured before an economic impact declaration can be made. In so doing, researchers must pay attention to the following factors:

Shifting. Researchers must be mindful that disruptions in households or business activity must be calculated net of all intra-regional shifting that may have occurred. Lost business productivity in one part of a community may be adequately made up by increased productivity in another. Many damaged businesses may be somewhat footloose and able to relocate locally with minimal disruptions. A region's housing stock may be adequate to absorb localized losses without impelling outmigration.

Offsets. And last, disaster recovery results in a short term, albeit potent, flow of social assistance and disaster-recovery payments which in turn boost overall regional consumption as well as economic activity broadly. Sorting out impact boosts from impact losses is virtually impossible as the two are being realized simultaneously during the early months of recovery. The payments to households, businesses, and industries. The very nature of a natural disaster will leave victims, in the aggregate, worse off than before the disaster.

Data Availability. Carefully constructed surveys might be used to confidently infer household consumption changes and business production changes to the larger population of afflicted entities. Surveys, however, are very expensive and difficult to administer in the aftermath of disasters, especially when households must relocate or firms become irrevocably damaged.

In the absence of reliable, directly collected data on either household consumption changes or business productivity adjustments, it is necessary to use secondary data to identify measurable potential economic impacts.

We did consider these factors as follows in developing our report on the economic impact of this disaster.

- Shifting – Given the very heavy seasonal resident population that does not use their Lake Delhi residence as a principal residence and the

large geographic footprint of the principal residence for these home owners, it would be highly unlikely for shifting to occur as these residents will not relocate to another local area for their seasonal homes on a lake, given the very limited (possibly none) other locations that would offer a similar situation to Lake Delhi. Additionally, many full-time residents are retired and will find another location, outside the state of Iowa, to reside if Lake Delhi is not restored.

- Offsets - There are a couple significant factors to consider in the Lake Delhi situation for offsets. First, a majority of the public assistance programs require that you must be a primary resident of the property that was damaged by the flood. Our initial estimates indicate that roughly one-third of the homes were damaged by the flood and a smaller subset of that group would qualify for assistance as a full-time residence. Second, the Lake Delhi area is located in Delaware County. Delaware County did not choose to participate in the national flood insurance program, so property owners could not obtain reasonably priced flood insurance. Most losses will not qualify for reimbursement by the owner's normal property/home owner's insurance coverage as most policies specifically exclude floods a covered event and offer no coverage for the losses. Insurance for boat damage in most cases is the exception to that situation.
- Data Availability – We have the ability to gather the data using surveys, so we feel confident in the source data obtained from those surveys and don't require the use of secondary sources to obtain our data.

Our report has given the proper consideration to these issues and should not have a material impact on the conclusions of this report.

SOURCES

“Economic Multipliers and Local Economic Impact Analysis” (December 2002) authored by David Kay, Senior Extension Associate at Cornell University.

“Evaluating Direct and Indirect Economic Outcomes of the 2008 Iowa Weather – Related Disasters” authored by the scientist in the Department of Economics, Iowa State University.

Attachment A

STUDY ON THE POTENTIAL IMPACT TO LAKE DELHI PROPERTY VALUES CAUSED BY THE 2010 FLOOD

Executive Summary

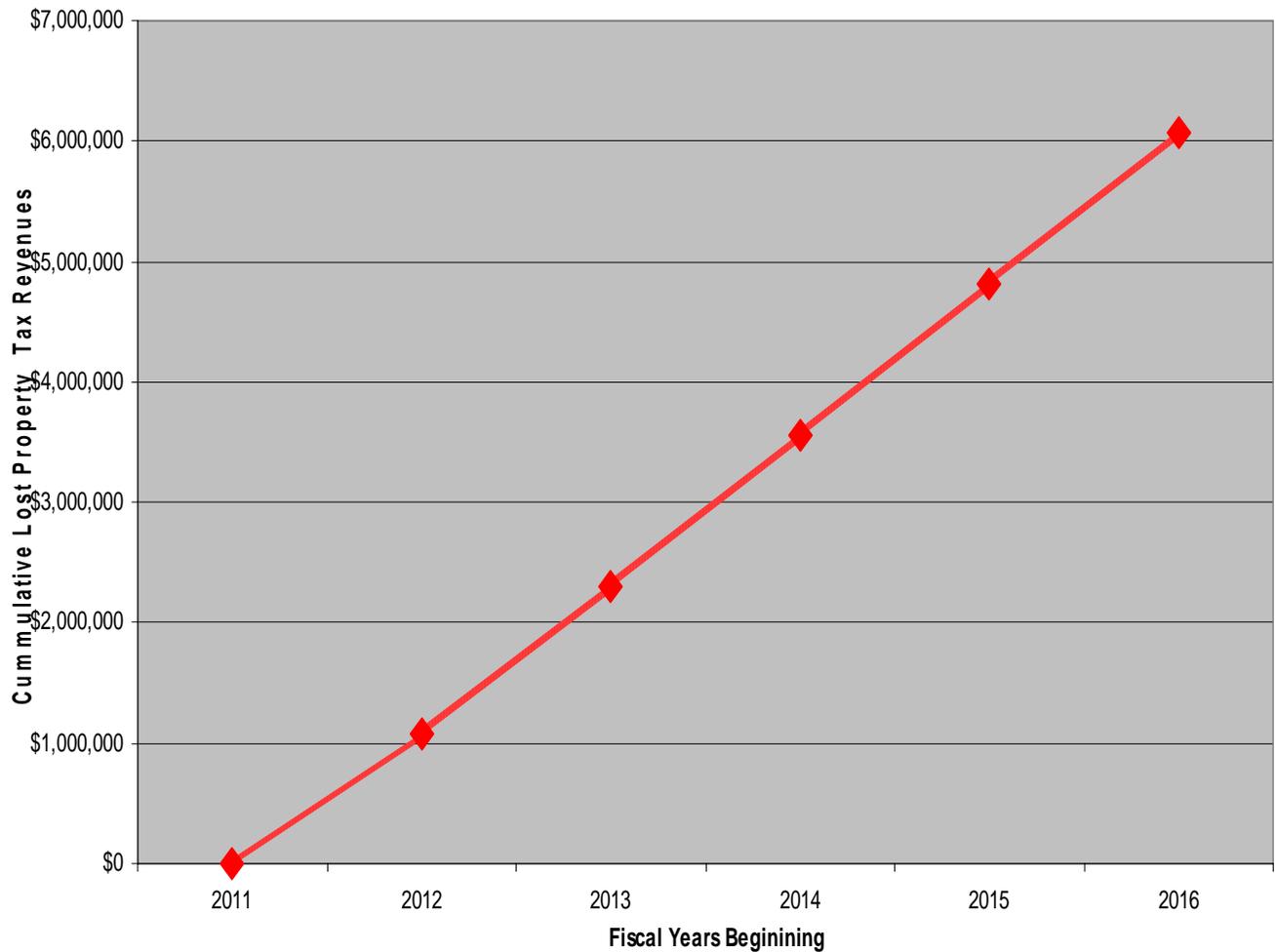
The impact of the flood on the Lake Delhi Tax District and other adjacent areas will be extremely significant. Due to the magnitude and immediate nature of this catastrophic event, the impact on assessed values and property tax revenues generated by the area will be initially severe and get worse as time goes on. State mandated changes to land will decrease assessed values by 80%. Those decreases will also have a very large negative impact on building assessed values. **If the Lake is not restored quickly, the resulting distressed market will continue to force values down substantially in following years.** We project the disaster impact on tax revenues to decrease by \$1.1MM initially and ultimately get to \$1.3MM by 2014. That equates to a net decline of 65% of the total tax revenues initially and ultimately be 77% by 2014/15. Post-disaster sales data is very limited, but early post-disaster sale data supports the conclusion of a drastic and immediate drop in values. This report projects 2011 assessed values that are more conservative than sales data at the time of this report.

Delaware County and Maquoketa Valley School District will be forced to decrease budgets or pass the loss of taxes back to tax payers by increasing tax levies to compensate for the loss in tax revenues. The Lake Taxing District accounts for roughly \$800,000 (21%) of the Maquoketa Valley annual property tax revenue. It also is projected to be \$1,908,000 of the Delaware County total annual property tax revenues based on 2010 Assessed Values.

There are two scenarios considered by this study. The first scenario assumes that the lake watershed is quickly restored and the second scenario assumes that the financial commitment by federal, state and county governments is slow and rebuilding process takes years to get off the ground and the status

of the rebuilding drags on for years (rather than months) and/or may never come to fruition. The following chart reflects the cumulative impact on LOST tax revenues given in the second scenario.

Cummulative LOST Tax Revenues without Lake Delhi Watershed Restoration



If the Lake Delhi Watershed were to be restored quickly (First Scenario) the impact would be drastically different compared to the Second Scenario where delays and the unknown will fuel the already distressed market. Assessed values in the First Scenario will decrease initially but rebound quickly and continue to grow at a rate that outpaces surrounding area as it has done over the last 10 years. The negative impact on Tax Revenues will

be minimized and quickly rebound to pre-disaster levels, allowing Tax Revenue growth in future years. The following chart reflects the difference in Tax Revenues generated by each of the two scenarios. By 2015 the projected annual loss from property taxes between Scenario 1 and 2 will approach \$1.5MM and will continue to get larger as time goes on.

This impact will also fold into the Economic Impact Study for the Region. With the “additional economic effect of the money” we project the loss of property tax revenue (or passing on the loss to taxpayers, by raising levy rates) will contribute an ANNUAL economic LOSS to the regional area of almost of **\$9 million dollars**. The total annual economic loss generated by the loss of the Lake Delhi Lake and Watershed is estimated to be at least **\$120 million dollars** as a result of the 2010 Flood Disaster.