Potential Impacts of Proposed Waste Transfer Station near Carbondale
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EXECUTIVE SUMMARY

BBC Research & Consulting (BBC) was retained by a coalition of local homeowners associations in the Carbondale area to assess the potential economic effects of a proposed solid waste transfer facility on County Road 100 (Catherine Store Road) less than two miles east of downtown Carbondale. The following are the key findings from this assignment:

- Waste transfer stations can increase the efficiency of a region's solid waste disposal system and can potentially reduce waste disposal costs.

- These facilities are not a benign land use. Waste transfer stations are officially recognized as a “noxious” or negative impact land use. Both the federal government and some state governments have analyzed the siting of waste transfer stations, primarily due to concerns about impacts on low income and minority communities.

- A 2006-07 nationwide study of waste transfer stations in Israel found statistically significant impacts on nearby residential property values. On average, estimated impacts extended approximately 1.8 miles from the site, with impacts decreasing with greater distance from the site. While no comparable study of U.S. waste transfer stations has been published to date, findings from prior studies of property value impacts from U.S. landfills support the results of the Israeli waste transfer site study.

- Applying the distance-impact function from the 2006-07 study to property values and locations near the proposed Carbondale waste transfer station results in a projected $16.5 million reduction in property values, corresponding to approximately $100,000 per year in reduced property tax revenues.

- The geographic and topographic characteristics of the proposed waste transfer station site, along with the nature of the Carbondale real estate market, may well lead to larger impacts than were found in analyses of more urbanized locations. Local realtors report that the proposed use of the site is already affecting the market and nearby residential property values. Delays in the development of residential lots near the site would have further economic consequences that were not captured in this study.
Potential Impacts of Proposed Waste Transfer Station near Carbondale

BBC Research & Consulting (BBC) was retained by a coalition of local homeowners associations near Carbondale to assess the potential economic effects of a proposed solid waste transfer facility on County Road 100 (Catherine Store Road) less than two miles east of downtown Carbondale. BBC has previously conducted a number of economic studies in Garfield County including the Land Value and Solutions Study, completed in 2006, which used hedonic valuation models to assess the potential impacts of natural gas development on local property values.

Background
Over the past several decades, development of solid waste transfer facilities has been an increasingly common response to growing economies of scale in solid waste disposal. Regulations promulgated by the U.S. Environmental Protection Agency (EPA) in 1988 established stricter standards for municipal landfills, requiring elements such as landfill liners, leachate collection systems and post closure monitoring systems. At least partly in response to these regulations, the number of landfills operating in the U.S. declined from approximately 8,000 in 1988 to about 2,800 by 2002 (Jenkins 2002). By 2010, the number of landfills in the U.S. had declined to about 1,900 facilities, though the volume of non-recycled waste has remained relatively consistent (EPA 2011).

Efficiency. In this setting of fewer and larger landfills, the primary economic benefit of solid waste transfer stations is increased efficiency in the solid waste disposal process. By consolidating, and often compacting, trash loads collected on smaller trucks onto larger trucks destined for the landfill, waste transfer stations reduce the labor and fuel costs associated with hauling trash (EPA 2002). If these cost savings are passed on to the communities served by the transfer facility, they can potentially reduce customer costs for solid waste disposal. At the regional level, reduced fuel consumption, and corresponding reductions in emissions, also provide environmental benefits. In the near vicinity of the transfer station, however, air quality may be adversely affected by trucks transporting waste to and from the facility.

Employment considerations. One of the arguments set forth by the proponents of developing a solid waste transfer station near Carbondale is that the station will create approximately 10 new jobs. While solid waste transfer stations do require employees, it is important to recognize that the primary economic benefit of these facilities is to reduce the costs associated with hauling municipal waste. It is likely that these cost reductions would include both reduced fuel costs and reduced employment for local waste haulers.

It is also worth noting that jobs at a waste transfer station, whether privately or publicly owned, are essentially comparable to the jobs provided by a local government agency. Unlike jobs in tourism, energy development, agriculture or manufacturing, these jobs do not bring new money
into the local economy and stimulate economic growth. Instead, these jobs are funded by taxes or fees levied on local residents to collect and dispose of their trash.

**Community Impacts and Costs**

The residents of Carbondale are not alone or unusual in expressing their concerns about locating a waste transfer facility in their community. Across the U.S., there are numerous communities where residents are either actively opposing proposed transfer facilities, or have successfully encouraged city councils or county commissions to reject plans to develop these facilities in their community. Among the most recent examples are small towns such as Powell, Wyoming; medium sized cities such as Pawtucket, Rhode Island; and large cities including Minneapolis, Nashville and New York.

**Recognition of community impacts.** Waste transfer facilities are officially considered to be a “noxious”, or negative impact, land use (NEJAC 2000, EPA 2002). Consequently, much of the analytical literature concerning impacts from the siting of waste transfer facilities has focused on concerns regarding environmental justice issues.\(^1\) As stated in the EPA handbook on siting waste transfer facilities:

> During the site selection process, steps should be taken to ensure that siting decisions are not imposing a disproportionate burden upon low-income or minority communities. Overburdening a community with negative impact facilities can create health, environmental, and quality of living concerns. It can also have a negative economic impact by lowering property values and hindering community revitalization plans. These are just a few of the reasons environmental justice concerns need to be addressed when selecting a site for a waste transfer station (EPA 2002).

Prior studies in North Carolina and New York City found that waste transfer stations were disproportionately located in minority and low income communities (Norton 2007, Maantay 2001). These findings were supported by a study conducted by the National Environmental Justice Advisory Council, Waste and Facility Siting Subcommittee (NEJAC) in a special report to the U.S. EPA. NEJAC conducted a series of workshops with residents living in proximity to waste transfer stations in New York City and Washington, DC.

In its workshops with members of the community, NEJAC found a consistent list of community concerns regarding transfer facilities, including:

- Nuisance/quality of life concerns – dust and odors, noise levels, visual impacts, and concerns about rodents and vermin;
- Traffic concerns – congestion and accidents;

\(^1\) Environmental justice refers to the consideration of whether public actions may disproportionately affect minority and disadvantaged (e.g. low income) communities.
- Economic concerns – impacts on property values and impacts on business attraction and retention;
- Health and safety concerns – primarily related to respiratory concerns and truck traffic; and
- Permitting and enforcement – lack of public participation and inadequate inspections and enforcement of codes and regulations (NEJAC 2002).

**Quantitative studies.** The standard approach to estimating the impacts of positive or negative environmental features on nearby property values is a technique known as hedonic pricing. Hedonic pricing is a method of explaining demand or prices for a particular good (e.g., a housing unit) by attaching estimates of value to each of its component characteristics (e.g., size of structure, age, quality of construction). Hedonic pricing is commonly used in real estate economics and consumer price index (CPI) development. Numerous studies since the early 1970s have investigated the effect on property values of proximity to special, distinguishable features and activities. These special features, near but not necessarily part of the real estate to be valued, are referred to as “externalities.” These have included both positive and negative attributes, from beaches to power lines to hog farms.

Although public concerns about the potential community and economic impacts of waste transfer stations are common, to date there have been few quantitative analyses of the impacts of such facilities. Hedonic pricing studies are expensive undertakings and can only estimate the effects of a facility like a waste transfer station after the facility is already in place.

The best available quantitative evaluation of the effects of waste transfer stations on nearby property values is a 2006-2007 nationwide study of waste transfer stations in Israel. There have also been numerous quantitative studies in the U.S. (and elsewhere) regarding the impact of solid waste landfills on property values. The following narrative discusses the results from prior studies of the impacts on property values from both types of waste disposal facilities.

In 2006, four Israeli professors completed a hedonic valuation study to examine the impact of four waste transfer facilities in different locations in Israel. Published in the journal *Waste Management* in 2007, the study found that waste transfer facilities have statistically significant, negative impacts on nearby residential property values. On average, waste transfer facilities affected residential property values within a radius of approximately 2.9 kilometers (1.8 miles) from the facility. The results from several different hedonic model specifications indicate that properties one kilometer (0.6 miles) from a solid waste transfer facility were reduced in value by between 6.4 and 8.4 percent. Properties two kilometers (1.2 miles) from the facility were reduced in value by between 2.6 and 3.2 percent (Eshet 2007).

While waste transfer stations are not landfills, they present many of the same types of concerns for the community on a lesser scale. There have been numerous hedonic valuation studies concerning the effects of landfills on property values. This literature was summarized in a meta-study produced in 2005 by the Northeast Regional Center for Rural Development at Pennsylvania State University. Based on a review of eight previously published studies, as well as original analysis of three landfill sites in Pennsylvania, the study reached the conclusions that all high volume landfills (500 tons per day or more) depress property values. The average
The impact of these types of landfills was estimated to be a 12.9 percent reduction for adjacent properties. The impact declined with increasing distance by 5.9 percentage points per mile (so a property located one mile from the landfill would be reduced in value by 7.0 percent). The authors found that the impacts of smaller landfills were less certain. Some previous studies found significant, though generally smaller, impacts for smaller facilities, while others did not (Ready 2005).

There is also a discussion of landfill impacts on property values in the Israeli study of waste transfer facilities. The authors note that several previous hedonic valuation studies of landfills had found that impacts extended approximately 4 to 6 kilometers (2.4 to 3.6 miles) from the site, compared to an estimated radius of impact of 2.9 kilometers for the waste transfer facilities (Eshet 2007).

Figure 1, below, compares the estimated impacts on residential property values from the waste transfer facility hedonic valuation study with the average impacts of large landfills from the 2005 meta study. The curves show estimated property value reductions at distances ranging from adjacent to the site to 3 miles away. As expected, the percentage reductions in value and the radius of impact for the waste transfer facilities are smaller than for the landfills.

Figure 1. Estimated Reductions in Property Values at Varying Distances from Waste Transfer Stations and Large Landfills

Potential Effects in the Carbondale Area

The proposed waste transfer station would be located on an elevated site, about one mile east of the city limits of Carbondale and approximately 1.5 miles east of the center of town. The site currently contains a former coal handling facility.

The lands most closely adjacent to the facility (north of the proposed site), primarily consist of relatively high end residential properties on large lots, together with a few agricultural properties that have not yet been subdivided for development. Among the residential developments, there is a mix of properties with homes and lots awaiting future home construction. As shown in Figure 2, the proposed site would be highly visible from throughout the valley east of Carbondale due to its elevated location part way up the ridge that forms the southern border of the valley.

Figure 2. Site of Proposed Waste Transfer Station

Figure 3, taken from the proposed site, shows nearby residential and farm properties, as well as the edge of the Town of Carbondale approximately one mile west of the proposed waste transfer station.
In the following discussion, BBC applies the information from the existing quantitative studies described previously to develop an estimate of the potential magnitude of economic impacts from the proposed Carbondale waste transfer station. We then discuss the specific circumstances regarding the proposed facility near Carbondale and how actual economic impacts in the Carbondale area may differ from the impact estimate derived from previous studies in other areas.

**Magnitude of Potential Impacts Based on Previous Studies.** To develop an estimate of the magnitude of potential property value effects of the proposed waste transfer station in the Carbondale area, BBC gathered data regarding the current values and addresses of developed and undeveloped residential properties in the area from the Garfield County Assessor. Using geographic information system software, the properties were mapped and classified based on their approximate distances from the proposed transfer station.

Figure 4, on the following page, depicts a series of concentric distance rings from the proposed waste transfer station site, ranging from ¼ mile from the site to two miles from the site. As discussed previously, the 2006-2007 study published in the *Waste Management* journal found that waste transfer stations affect property values within a radius of just under 1.8 miles from...
their location. Based on the 2006-2007 analysis, the average impact on property values within each distance ring was estimated as follows:

- 0 to 0.25 miles from site: -9.0 percent
- 0.26 to 0.5 miles from site: -8.0 percent
- 0.51 to 0.75 miles from site: -6.6 percent
- 0.76 to 1.00 miles from site: -5.0 percent
- 1.01 to 1.25 miles from site: -3.4 percent
- 1.26 to 1.50 miles from site: -2.0 percent
- 1.51 to 1.75 miles from site: -0.8 percent

Figure 4. Location and Distance Rings from Proposed Waste Transfer Site

The closest properties to the site (within a radius of ¾ of a mile) are primarily homes and undeveloped residential properties on large lots, along with agricultural properties which were not included in BBC’s analysis of impacts to property values.\(^2\) There are approximately 48 residential properties located within ¾ of a mile of the proposed waste transfer station.

From just over ¾ of a mile to the estimated extent of property value impacts at approximately 1.75 miles from the site, the distance rings include much of the Town of Carbondale as well as additional large lot properties closer to the eastern end of County Road 100 and near Highway 82. Between ¾ of a mile and 1 ¼ miles from the proposed site, there are approximately 478 residential properties. Between 1 ¼ miles and 1 ¾ miles from the site there are 1,281 residential properties.

Based on the distance-impact function identified in the 2006-2007 study, the estimated total reduction in property values within 1.75 miles of the proposed site would be approximately $16.5 million. Further detail is provided in Figure 5.

**Figure 5. Potential Impacts on Residential Property Values based on 2006-2007 Study**

<table>
<thead>
<tr>
<th>Area</th>
<th>Residential Properties*</th>
<th>Market Value</th>
<th>Taxable Value</th>
<th>Projected Impact</th>
<th>Total Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within 0.25 miles</td>
<td>21</td>
<td>$13,100,820</td>
<td>$1,057,090</td>
<td>-9.0%</td>
<td>-$1,183,511</td>
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<tr>
<td>0.26 to 0.5 miles</td>
<td>15</td>
<td>$8,607,370</td>
<td>$757,340</td>
<td>-8.0%</td>
<td>-$686,197</td>
</tr>
<tr>
<td>0.51 to 0.75 miles</td>
<td>12</td>
<td>$9,051,360</td>
<td>$1,171,270</td>
<td>-6.6%</td>
<td>-$600,067</td>
</tr>
<tr>
<td>0.76 to 1 mile</td>
<td>60</td>
<td>$24,524,260</td>
<td>$1,963,510</td>
<td>-5.0%</td>
<td>-$1,227,682</td>
</tr>
<tr>
<td>1.01 to 1.25 miles</td>
<td>418</td>
<td>$165,891,320</td>
<td>$13,983,500</td>
<td>-3.4%</td>
<td>-$5,611,119</td>
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<tr>
<td>1.26 to 1.5 miles</td>
<td>606</td>
<td>$245,813,010</td>
<td>$21,323,990</td>
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<tr>
<td>1.51 to 1.75 miles</td>
<td>675</td>
<td>$275,115,970</td>
<td>$24,049,680</td>
<td>-0.8%</td>
<td>-$2,268,861</td>
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<tr>
<td>Totals</td>
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<td>$742,104,110</td>
<td>$64,306,380</td>
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<td>-$16,465,774</td>
</tr>
</tbody>
</table>

Note: Includes both developed homes and residential lots.


In Colorado, the taxable value of residential properties is currently about eight percent of the estimated market value. As indicated in Figure 5, the projected $16.5 million reduction in the market value of residential properties would correspond to about a $1.4 million reduction in their taxable values. Based on current average total property tax rates of 68.55 mills (about 6.9% of taxable value) in the unincorporated area and 71.23 mills (about 7.1% of taxable value) in the Town of Carbondale, the projected reduction in annual property tax revenues would be just over $16.5 million.

\(^2\)The previous hedonic property value studies of waste transfer stations and landfills described earlier focused entirely on impacts to residential property values and cannot be reliably extrapolated to other property types, although the agricultural properties in proximity to the proposed Carbondale waste transfer station may be subdivided and developed in the future.
$100,000 per year. Any property tax reduction would affect each of the property taxing entities in the area, including the Town of Carbondale, Garfield County and School District RE-1.

**Specific Considerations Regarding the Proposed Carbondale Facility.** Prior analyses in other locations indicate a potential reduction of $16.5 million in Carbondale area property values if the proposed waste transfer site is developed. However, specific characteristics of both the proposed Carbondale waste transfer station and the surrounding property markets are at least as important as the prior experience with waste transfer stations in other places. The actual impacts in the Carbondale area could be larger or smaller than the generalized estimates just described.

The distance-impact function used in this analysis is based on the average impacts on residential property values from several waste transfer stations analyzed in the 2006-2007 study. If the proposed waste transfer station near Carbondale is developed as a state of the art facility, and both the facility and the traffic flow to and from the site are well managed and closely regulated, the impacts on surrounding properties could be reduced.

However, several Carbondale-specific factors suggest the impacts may be larger than the estimates described previously. As indicated by the images shown in Figure 2 and Figure 3 earlier in this report and in Figure 6 on the following page, the proposed site is a very prominent location which is highly visible from a considerable distance, particularly in the unincorporated area east of the Town of Carbondale. The site is also located along one of the two primary entrance routes into the Town of Carbondale – the more scenic eastern entrance. Visual, and potentially sound, impacts are likely to be greater than average for a typical waste transfer station located in a suburban environment.
The nature of the rural Carbondale real estate market is also a very important consideration. In contrast to the suburban waste transfer stations which were the focus of the 2006-2007 research, local realtors report that the primary factors for buyers considering a home in rural Carbondale are open space, peace and quiet, proximity to the river and rural views. Other home buying factors that could tend to offset relative proximity to a waste transfer station in a more urbanized area, such as proximity to work, are less important in the Carbondale area.

In a market in which buyers are still relatively scarce and have numerous properties to choose from in other areas as well, area realtors report that the proposed waste transfer station is already having an impact on the market in the Carbondale area. Realtors are required to disclose the proposed change of land use to potential buyers and indicate that the reaction has been universally negative, with potential buyers choosing to shift their attention to places such as the Crystal River Valley between Carbondale and Redstone, the Basalt area in Eagle County and Missouri Heights when informed about the proposed waste transfer station.

As noted earlier, there are a large number of residential lots in proximity to the proposed waste transfer station where homes have yet to be built. This report has not attempted to quantify the

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3 BBC interviews with realtors from Amore Realty, Sothebys Basalt and McKinley Sales, November 2012.
economic cost associated with potential delays in the development of these properties due to
deterioration in the desirability and marketability of their location. Such costs would include
both reductions in these properties’ ultimate value once they are developed and reductions in
residential construction activity and employment during their development.

On balance, BBC believes the potential impact estimates provided earlier based on studies in
other locations provide a conservative view of the potential effects on property values if the
waste transfer station is developed near Carbondale. Due to a combination of the prominence of
the proposed site and the nature of the rural Carbondale real estate market, actual impacts may
well be larger than the estimates described in this report.

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