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EFFECTS OF THE PROPOSED INDECK FACILITY
ON PROPERTY VALUES, LAND USE AND TAX REVENUES

by

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I. SUMMARY

The proposed Indeck facility at Libertyville would create a disamenity whose impact would be detrimental to property values, to future development and to tax revenues in the Libertyville area. If these costs were included in a comparison of alternative possible locations, the most favorable location would almost certainly be, not at Libertyville, but rather at some other location where these types of costs are less.

As a first step in establishing this conclusion, Part II enumerates the several factors determining the impact of a disamenity. Often the procedure is followed of considering various individual physical characteristics separately. However, the impact is likely to be greater than indicated by the sum of the impacts of a facility's individual visual, noise and other physical characteristics. Taken together, the characteristics

act to raise awareness of the facility. Passers by are affected. Many of the passers by live in the general area, making the impact extend beyond the actual residences at which the facility can be seen or heard. Other industrial-type facilities near the proposed facility could act either to increase or decrease the detrimental impact of the facility. It is important to note that, unless an area is completely blighted, the facility will have some detrimental impact. The existence of other industrial-type facilities nearby in no way justifies ignoring the detrimental impact of the facility in question.

Part III considers the effects the Indeck facility would have on the value of existing residences. Highly reputable research studies have established beyond doubt that electric power facilities have detrimental effects on residential property values. The most nearly comparable situation for which a property value study has been done is for Winnetka's municipal power plant. Its capacity is only 25 megawatts as opposed to 300 megawatts for the proposed Indeck facility. The Winnetka plant is aesthetically less offensive, having only one relatively thin traditional stack of a type people are used to seeing, as opposed to the two strange thick rectangular-shaped stacks of the proposed Libertyville plant. The Winnetka plant has a building of a traditional type. It is not visible except at the plant because it is down by Lake Michigan below Winnetka street level, completely hidden because of the sharp drop in the terrain. Only the top of the stack is visible at the level where people live. In contrast, a modern peaker facility such as proposed for Libertyville has unattractive tanks, pipes, sheds and poles in addition to its strange stacks. Details of these additional features are not shown in artists' renditions. While the additional features may be partially hidden by berms and plantings, it is difficult to believe that they can actually be completely hidden. Even if this is possible, a berm itself is unnatural looking, and the strange stacks will still protrude.

The Winnetka study gives estimates of the subtraction from the value of an individual property caused by a facility, as a function of distance from the facility. The subtraction from value is less, the farther is a residence from the facility, out to a distance of approximately two miles. The total property value effect depends on how many residences there are at each distance from the facility out to the two mile limit. An estimate of the total decrease in property value that would be caused by the proposed Indeck facility in Libertyville can be obtained by applying the estimates of effect of distance on property value from the Winnetka study to properties in the Libertyville area. To apply the method, tax assessments were converted to estimated market values for each of the 2456 residences within two miles of the site of the proposed Indeck facility. The subtraction from market value that would be caused by the Indeck facility was calculated for each residence. These

effects were summed to arrive at the total decrease in property value that would be caused.

The estimate resulting from applying the method is that the total value of existing residential properties in the Libertyville area would be reduced \$12.7 million.

Part IV considers effects on future residential property values if land zoned for single family residences that is not now developed is brought into development. Conservative estimates were used for densities of the new residences and the value of the properties. The procedure gives an estimate of numbers of residences and property values in the future if land presently zoned residential becomes fully developed. The method for estimating the effect of the peaker on property values was applied assuming the existence of these additional residences.

The resulting estimate of total subtraction from value of properties, assuming that the projected additional residential development takes place in the future, is \$25.1 million.

Part V considers discouragement to residential development. The Indeck facility could cause the value of new homes to be lower than would occur in the absence of the facility, and it could cause some land not be developed at all. These possibilities take on increased likelihood if it is supposed that a blight-begets-blight sequence would ensue from building the Indeck facility. A blight-begets-blight sequence is brought on by the well known tendency to choose locations for new disamenities that are near to existing disamenities.

Granting a variance to permit construction of the Indeck facility in Libertyville could lead to a predisposition to approve more and more repugnant facilities, leading to the Mallory Park area becoming a massively unattractive area. Higher income families are more demanding of nice surroundings than lower income families. Developers could find it more profitable to build, say, middle income housing, instead of upper income housing that would be built in the absence of the facility. If the Mallory Park area became sufficiently blighted by unattractive facilities, much surrounding residential development could be precluded altogether. No-one would want to live nearby.

As a suggestive estimate of risks associated with discouragement of future residential development, if the value of new residential property that would be developed in the absence of the peaker were cut in half by the peaker, the loss in property value would be \$128.4 million, which is in addition to the peaker distance effect causing a \$18.9 million loss on properties that would still be in existence. The total loss in property value would then come to \$147.3 million.

Part VI estimates the loss in property tax revenues resulting from the adverse effects on property values. If confined to existing residences, the estimated yearly property tax revenue loss is \$306 thousand. If land zoned for single family residences not now developed is brought into development, the estimated yearly property tax revenue loss on this greater number of residences is \$602 thousand. If the peaker facility causes further residential development to be cut in half, the tax revenues on half the potential residential development would be lost, and there would be reductions in revenues from residences that would be in existence whose value would be diminished by the peaker. The total yearly loss comes to 2.4 percent of \$147.3 million, or \$3.5 million.

The yearly tax losses would persist year after year. The present value, taking account of the fact that repeated yearly losses are caused, is the capitalized value of the losses. This is, for example, the value of a bond issue that could be paid off if tax revenues were not reduced. Assuming an interest rate of 8 percent, the present value of the property tax revenue loss is \$3.8 million if only existing residences are considered, \$7.5 million if land now zoned residential is brought into development at comparable values to those now existing, and \$44 million if the peaker facility causes half of the new residential development not to take place.

Part VII considers how the costs to the Libertyville area affect the choice of the best site for locating a peaker facility. The net benefits of the facility ignoring costs imposed on local residents are reflected in Indeck's revenues from the facility less the company's costs of building and operating the facility. If the costs imposed on local residents are subtracted from the net benefits so calculated, a truer measure of net benefits is obtained. Locations where fewer costs are imposed on local residents will appear more favorable. If these costs to the Libertyville area are included in the total costs of the facility, it is highly likely that a comparison of alternative locations would result in choice of a site other than Libertyville. The site would most likely be in a rural area or in an existing blighted area, and it would most likely be outside the Chicago ozone non-attainment area.

Part VIII concludes.

II. FACTORS AFFECTING THE IMPACT OF A DISAMENITY

A. Visual Effects

To begin the analysis which has been summarized in part I, a disamenity is caused by contributory physical characteristics, of which there may be several. Consider first the visual effects.

Previous testimony makes it clear that the Indeck facility and especially the stacks would be visible for some distance. The visual effect depends on a variety of attributes of each of the various components of the peaker facility including their shape, color, texture, size and, perhaps above all, harmoniousness with the environment as determined by all the attributes acting together. It is to be emphasized that facility size is only one among many attributes that determine the visual effect. For example, from the most distant points of visibility, the disamenity may form a small part of the horizon. Still, it is a disruption to the environment and is jarring to sensibilities quite apart from whether it is a small or large part of the totality of what is seen.

B. Noise

Testimony on noise makes it clear that the facility will emit intermittent noises audible to nearby residents. The effect of the noise depends on the character of the noise including unpleasantness, unnaturalness, loudness, the extent to which the sound fits in harmoniously or conflicts with other sounds, and the extent to which the sound is continuous or intermittent. Intermittent sounds can conceivably be more troublesome than continuous sounds, because the beginning and end of the time of the sound causes those hearing it to be more aware of it than if it goes on continuously causing it to be suppressed from consciousness. Given the subtle nature of noise, measures of decibel levels reflecting only loudness are likely to be an incomplete and inadequate indicator of the dissatisfactions connected with the noise.

C. Combined Effects of Unsightliness and Noise

Consideration of visual effects, noise and other physical characteristics in isolation of each other can be misleading. The significance of the disamenity is the combined result of the contributory physical characteristics. If someone sees unsightly stacks every day connected with a completely silent facility, the sight may be of some bother. Similarly, if a person hears an intermittent noise whose source is not identified, the noise may be of some bother. The sum of the sight and noise effects increases the bothersomeness even if the effects are only additive. Beyond this, thresholds of consciousness may be crossed such that the bothersomeness of the facility is increased beyond the simple sum of the individual effects. The person becomes aware of the existence of a nuisance which it is not desirable to live near and which on the basis of either of the two effects alone might not be considered to be much of a nuisance.

D. Impact on Residences Where Disamenity Characteristics

Are Not Directly Discernible

People do not have to be at their place of residence to be affected by a disamenity. The disamenity enters the senses of people passing by. Among the people who pass by most frequently, indeed on a daily basis, are the people who live nearby, which explains why deleterious effects extend to residences beyond the distance from which the facility is physically seen or heard.

E. Effects of Other Nearby Disamenities

How much a person minds a disamenity depends to some extent on whether there are other disamenities close to it. The disamenity in question, e.g. a peaker facility, remains bothersome, but the existence of another disamenity, e.g. a water works, may either increase or decrease the bothersomeness of it. If there are not many other disamenities close by, the effect of the existing disamenities may be small enough that a threshold of consciousness of them is not crossed. Then if adding another disamenity increases effects enough for people to become conscious that the vicinity of the disamenities is a despoiled area characterized by nuisances, adding the disamenity will have a greater effect than any of the disamenities already there. It is to be emphasized that, unless an area is despoiled by so many disamenities that people write it off as completely blighted, adding a disamenity will be of some bothersomeness.

F. Effect on the Reputation of an Area

As an area acquires more disamenities, the satisfactions of people living near the area are directly decreased for the reasons noted above. An additional effect is that the area gets a reputation for being undesirable. People living away from the area, who are not directly affected by the disamenities, view the area as undesirable. The satisfactions of people living near the disamenities are further decreased because they acquire the reputation among other people as living in an undesirable area. Where they live reflects on them, and a person's reputation is something that is cared about most.

G. Attraction of Future Undesirable Land Uses If a Disamenity is Added at the Present Time

1. The Blight-Begets-Blight Principle

There is a dynamic consideration to adding a disamenity to an area. A well known tendency is that blight begets blight. The tendency may be the result of a human trait to put waste all in one place that will only be visited when the waste is to be disposed of and otherwise will not have to be seen. In this manner, the exposure to the waste is minimized. The tendency transfers to social behavior toward waste. For example, in

choosing to get rid of trash that will not be picked up by waste disposal services, it is often observed that people dump the trash around the outside of a landfill. On a beach, if a previous visitor has left litter, the current visitor is likely to be less hesitant to leave litter than if the beach was found to be perfectly clean.

2. Application to Zoning

Zoning, delineating areas in each of which a given type of land use is permitted, reflects in part the blight-begets-blight tendency. If the amount of land devoted to each type of use is given, then separating the uses may minimize the harmful effects of disamenities. The disamenities are put all in one place where people do not go very often, instead of being scattered into neighborhoods where the effects are imposed on residents every day. This minimizes the extent to which people living in residential areas are exposed to the disamenities.

3. Inability to Completely Eliminate Effects on Residential Neighborhoods

In reality, complete separation of effects is unlikely to be possible. For example, areas of industrial use may be in sufficient proximity to some residential areas that those residents suffer dissatisfaction from the industrial disamenities. Property values in such residential areas are adversely affected, and the effects may be so undesirable that some nearby areas that would have been developed residentially are never developed.

4. Lack of Necessity for Community to Accept Undesirable Uses

If a nuisance disamenity must be located in a community, then separation rather than indiscriminate placing in an entirely residential neighborhood can help minimize its effects. However, the uses leading to disamenities are not in reality a given for a community. A community can decide whether a particular activity should be permitted in the community at all. The decision will depend on the nature of the activity. Some activities will warrant being admitted to the community, while others will not. High transport costs may dictate that some services such as landfilling and water supply must as a practical matter be supplied locally. Light industry land uses, that bring tax revenues on their activities as well as tax revenues on residential properties that are developed for the people who will work in the industry, may bring benefits to the community that are sufficiently great to overcome the modest disamenity effects of the industry. However, there are other uses that bring little or no benefit to the community. The community may decide that

the redeeming features of the activity, if any, are insufficient to warrant bearing the losses from disamenities imposed on residents of surrounding properties.

5. Magnified Effect of Granting an Unwarranted Variance

The dynamic consequences of the blight-begets-blight tendency greatly accentuate the importance of the decision as to whether to allow a disamenity. If a disamenity is added that is of little or no benefit to a community, there is a tendency to take the attitude that the disamenity harm is already done and that adding other disamenities is simply putting like things together. The bar will be lowered on what is considered an acceptable disamenity. This is particularly true if the disamenity in question involves the granting of a variance. The tendency, if not the legal onus, will be to grant future requests for similar variances. The area of the disamenity is cast into a continuing downward cycle of increasing disamenity in the future. The area may end up in a permanently blighted condition, that would not have occurred had the original variance not been granted. This will be all the more the pity if the original granting of the variance was for a use that did the community no good in the first place.

H. Application of Above Considerations to Proposed Indeck Facility

To relate the above considerations to the proposed Libertyville peaker facility, disamenities already near to where the peaker facility would be built include the adjacent industrial park of light industry buildings, the water works and two rail lines.

The light industry buildings are low, landscaped and attractive. Most of them are not visible from outside the park. If all of the land in Mallory park were developed in this manner, the park might not be considered a source of disamenities at all.

The water works are quite visible, though with structures of a type often seen and therefore not as strange or distracting as a peaker facility. The fact that this disamenity exists does not mean that adding the peaker plant will not be a source of additional disamenity.

The disamenity effect of the two rail lines is mitigated to some extent by the fact that rail lines are a common sight and that one of them provides passenger service to residents helping to offset disamenity effects. It is commonplace for rail lines, especially commuter lines, to pass through residential areas, many of which are pristine.

The landfill located to the west of Mallory Park may or may not have some disamenity effect whose area of influence overlaps that of the proposed peaker facility. The landfill is however quite far away. As with other disamenities, its existence in no way implies that the peaker will not be an additional source of disamenity. The deleterious effects of the landfill on property values, if any, are already there. They do not preclude additional effects of the peaker on property values. Moreover, the landfill will eventually be covered over. The site will be landscaped to become an attractive amenity, with no evidence that it was ever a landfill site. If residences are eventually built there that are within the area of influence of the peaker, the peaker will detract from property values there.

The conclusion is warranted that the proposed peaker facility would definitely have disamenity effects and that the existence of other disamenities in the vicinity of the proposed peaker facility will not eliminate the existence of bothersomeness from the peaker facility. The fact of their existence does not justify placing the peaker facility in Mallory Park. The blight-begets-blight principle increases the risk of magnified effects.

Given the conclusion that the facility will undeniably have undesirable effects, the question becomes: how important are they? Estimation will now be considered.

III. DETRACTIONS FROM VALUE OF EXISTING RESIDENTIAL PROPERTIES

A first effect of the existence of the nuisance disamenity is to detract from values of residential property already in the vicinity.

A substantial body of work exists that provides estimates of effects of amenities and disamenities on property values and shows them to be important. One of the earliest studies, which helped to initiate interest in this subject among urban economists, was by Harris, Tolley and Harrell (1968). This study found that amenity and disamenity considerations accounted for fully half the observed variation in residential land values. In ensuing work, Ridker and Henning (1969) estimated effects of air pollution on property values. Since that time a large number of studies have been carried out that find significant effects on property values of a variety of sources of disamenities including power plants, hazardous waste facilities, airports, radioactive materials, chemical manufacturing and others. See Clark and Nieves (1994) for a review of many of these studies. The studies use well developed scientific methodologies based on statistical analysis of large samples of residential property sales, controlling for other influences on property values. The studies leave no doubt that disamenities have substantial effects on

residential property values.

It is important to establish that disamenities have significant effects on property values, in view of the difficulty that appraisers sometimes have in identifying these effects. Appraisers may discern little or no property value effects of disamenities such as power plants, even though scientific statistical studies show them to be important. A principal reason may be that appraisers are primarily concerned with estimating the value of a property based on observation of prices of similar residences in the neighborhood of the property that have recently been sold. They are not concerned with careful measurement of effects of distance from disamenities, which may often involve comparisons between neighborhoods located at different distances.

The proposed peaker facility for Libertyville does not exist, and so any estimate of its effect must be based on what has happened elsewhere. No existing peakers in proximity to a substantial number of residences have been found which could serve as a basis for comparison. Even if a comparable peaker situation were found, to conduct a new study would be quite expensive and in any case could not have been completed in time for these proceedings.

The most nearly comparable situation that has been carefully studied previously is Winnetka's municipal power plant, whose property value effects were estimated by Blomquist (1974).

Applying the Blomquist analysis of property value effects of the Winnetka power plant to the Libertyville situation provides a basis for concluding that the proposed Libertyville peaker facility will have a substantial negative impact on property values. While the Winnetka and proposed Libertyville facilities are not exactly the same, conservative estimates of effects reveal that the impacts would run into many millions of dollars.

Figure 1 is a picture of the Winnetka facility. The facility is a small coal-fired electric power plant located on Lake Michigan at lake level, 100 feet below Winnetka street level. The picture in Figure 1 was taken at lake level and shows the facility in full. To obtain this view it is necessary to descend a very isolated and little used section of road not encountered by Winnetka residents in their everyday life. Only the 150 foot top portion of the plant's stack is visible to residents. No other part of the plant is visible at street level. The stack is discernible when looking down one street, Tower Road, which is heavily lined with trees. The stack can be seen from the middle of the street but is otherwise shielded from view by the trees. Within a few hundred feet of the stack, because of the nearness of trees relative to the stack when looking down the road, the trees come to extend farther into the

sight line of horizon than does the stack. That is, from the perspective of the viewer, the height of the stack as an object on the sky line is less than the height of the trees.

In contrast, the two stacks of the proposed Libertyville facility would each be 65 feet high, and each would be fatter than the single stack in Winnetka. The two stacks in Libertyville would take up more air space and would be a more noticeable feature of the skyline because they would extend well above any trees, landscaping or other shielding.

Figure 2 is the view of the Winnetka facility as seen by residents. It is the top of the stack visible looking down Tower Road.

For contrast, Figures 3 through 6 show pictures of the 680 megawatt Ellwood peaker located near Dundee behind a cement mixing establishment in a heavy industrial area not visible from the highway or any residents. The proposed 300 megawatt Libertyville peaker would require similar equipment. The Ellwood pictures are from various angles somewhat as would be seen in Libertyville. While the pictures had to be taken closer to the facility than would ordinarily be seen by residents of the similar facility proposed for Libertyville, the unattractive nature of the stacks and of the accompanying tanks and buildings is apparent. It is difficult to believe that any landscaping around the proposed Libertyville facility could make a "silk purse" out of this "sow's ear". Disamenity effects will remain.

The Winnetka power plant appears to be less of a disamenity than the peaker facility proposed for Libertyville. The capacity of the Winnetka plant is only 25 megawatts as compared to 300 megawatts for the proposed Libertyville peaker. The proposed peaker would be gas-fired, and the Winnetka facility is coal-fired. In a study of different types of noxious facilities, Clark and Nieves, *op. cit.*, found that the negative effects of coal-fired and gas-fired facilities on property values are quite similar, as indicated by the coefficients for gas-fired and coal-fired plants in the housing value equation results in Table III on page 247 of their study. The Clark and Nieves study was a broad national study using approximately 49 thousand observations. There was insufficient detail on local distances to permit its use in estimating effects of the proposed Libertyville peaker. Still, it provides the best evidence found on the comparative effects of gas-fired and coal-fired plants. If gas-fired and coal-fired plants of the same size have essentially the same effects on property values, which is an inference from the Clark and Nieves study that lumped all sizes together, the smaller capacity of the Winnetka plant should make it less of a disamenity.

Figure 7 shows 1/2 mile, 1 mile, 1 1/2 mile and 2 mile

rings around the Indeck site which were used in estimating the property value effects in Libertyville. 2456 residences within the rings were identified from tax records. The 1999 assessed values of each residential property were obtained from Carol Sonnenschein of the Liberty Prairie Foundation. These values were multiplied by 3 to obtain estimated market value, in view of the well known fact that a multiple of this order of magnitude is needed to convert assessed values to market values.

Estimates of effects of the peaker facility on property values were obtained by assuming that the effects found by Blomquist on value of a property, as a function of distance from the facility, are applicable to the proposed Libertyville peaker. According to Blomquist

An indication of the per property change in property value is given by the elasticity of property value with respect to distance from the power plant computed at the mean values of the observations. This elasticity is 0.09. It can be interpreted as follows: within 11,500 feet of the power plant, a typical property value increases in value 0.9 per cent as it "moves" away from the power plant by ten percent. (Blomquist, op. cit., p.99)

In applying the Blomquist result to the Libertyville area, the elasticity at the mean values calculated by Blomquist can also be interpreted as being the elasticity with respect to distance from the edge of influence of the power plant. This interpretation is needed in order to anchor the estimates to a starting point, which is the zero influence of the power plant at an 11,500 foot or approximately two mile distance. The mean value of the distance from the power plant within the zone of its influence is about one half the distance to the edge of its influence or approximately one mile. The mean value of distance from the edge is one half the distance to the power plant or also approximately one mile. The Blomquist elasticity of .09 is obtained starting with the slope coefficient for effect of distance from power plant, which is 0.6166 in his equation (2) on page 99 indicating a rise in value of \$0.6166 in property value for each one foot increase in distance from the plant. This is the same as a fall of \$0.6166 for each one foot increase in distance from the edge of influence going toward the plant. Since the elasticity is defined as the ratio of proportionate change in property value to proportionate change in distance, \$0.6166 must be divided by the mean property value and multiplied by the mean distance to obtain the elasticity at mean values. Using Blomquist's data for the mean property value and the mean distance to either the power plant or the edge of influence of the power plant which as we have noted are both approximately 5,280 feet, gives the same .09 elasticity of property value change with respect to distance either from the plant or from the

edge of influence when calculated at the means.

In applying the method, the average distance to each 1/2 mile ring was used. For residences in the outermost or 1 1/2 to 2 mile ring, the average distance from the plant is 1 3/4 miles. This is 1/4 mile closer than the 11,500 foot, or approximately 2 mile, limit at which there is no longer a property value effect. As a fraction of two miles, the 1/4 mile distance is 1/8 or 12.5 percent of the distance to the outer edge of influence of the plant. Since the estimated effect on property values is a 0.9 percent loss for every ten percent increase in distance, and the distance from the edge of influence for this ring is 12.5 percent instead of the 10 percent to which the 0.9 figure applies, the estimated effect on property values in this ring is (12.5/10) times 0.9 or a 1.124 percent loss in property value. This loss was applied to the market value of each residence in the outermost ring. Proceeding to the 1 to 1 1/2 mile ring, the average distance from the 2 mile limit is 3/4 mile, which is 3/4 divided by 2 or 37.5 percent of two miles. The loss in property value for each residence in this ring is (37.5/10) times 0.9 or 3.375 percent of market value. In the 1/2 to 1 mile ring, the average distance from the 2 mile edge of influence is 1 1/4 miles which is 62.5 percent of the 2 mile distance giving a loss of (62.5/10) times 0.9 or 5.625 percent for each residence in this ring. In the 0 to 1/2 mile ring, the average distance of 1 3/4 miles to the 2 mile edge of influence is 87.5 percent of two miles giving a loss of (87.5/10) times 0.9 or 7.875 percent for each residence in the closest ring. The losses on all the properties in each ring were added to arrive at total property value loss.

Table 1 shows the resulting estimates of effects of the proposed Libertyville peaker on values of the existing properties. The estimated total loss in property value is \$12.7 million. The loss is \$5.7 million for Libertyville. The losses are \$2.9 million for Mundelein and \$4.1 million for Grayslake.

These figures are mid-range or most likely estimates. It may be noted that two other sets of estimates could be developed from the Blomquist study, one that would give lower estimates and the other that would give higher estimates than those just presented.

The method that would give the least loss in property values is based on the 0.6166 coefficient from Blomquist's regression not converted to an elasticity. This method is described by equation (3) on page 99 of his article. Applied to the Libertyville situation, this method gives a total property value loss of \$5.4 million.

The method that would give the greatest loss is based on the assumption that all property within range would be equally

affected, both residential and non-residential, and not just the built-up residential property that we use as giving the most likely effect. The method giving the greatest loss is given by equation (4) on page 99 of the Blomquist article. In the Blomquist article, the high estimate is 88 times as great as the low estimate. The high estimate has not been calculated for the Libertyville area as it does not suit the purpose of estimating effects on existing residential properties. Since the low estimate is only somewhat lower than the middle estimate used here and the high estimate is many multiples higher, if we took the average of the three estimates, the average would be a great deal higher than the middle estimate used here.

Further on the low estimate, using the Blomquist coefficient not in elasticity form would assume that absolute (i.e. linear) relations between distance from the disamenity and property values when the study was conducted continue to hold. If used, a method for updating the coefficient would have to be developed. Obtaining data to do so could require a large research project. The middle estimate, which is the one we use, makes the better assumption that relative (i.e. percentage) relations between distance and residential property values hold. Relative relations are generally found to have better predictive power than linear relations when applied to different data levels, as in the present case where property values have changed. This consideration favors the middle estimate used here.

The high estimate if used would assume that all properties, whether built up or not, would be affected to the same extent as currently built-up residential areas. This type of consideration is applicable to the possibility that the peaker would affect future as well as present residential properties, leading to risks brought out in our consideration of effects on properties developed in the future and on amount of future development. These risks are real and are a consideration arguing against building the proposed Libertyville peaker, but they involve less certain events. We consider them separately from the more certain losses in value of presently existing residential properties being dealt with in the present section.

While the relation in relative terms used here is more likely to prevail than an absolute relation, the Blomquist elasticity--which is his result expressed in relative terms--could be greater if estimated today. It is well known that people have become increasingly concerned generally about environmental disamenities, which would make them less willing to pay as much for properties where there are disamenities, making the elasticity greater. Since people have higher incomes, apart from environmental concerns as such, a high income elasticity of demand for amenities, with people caring more about amenities as their incomes rise, could accentuate the tendency for the elasticity to be higher today. A higher elasticity would make

the property value loss greater than estimated here using the Blomquist elasticity.

IV. DETRACTIONS FROM PROPERTY VALUES IF UNDEVELOPED LAND SUITABLE FOR RESIDENTIAL USE IS DEVELOPED IN THE FUTURE

In addition to effects on values of existing residences considered in the preceding section, a second effect is to detract from the value of residential properties that will come into existence in the future. Considerable land within the range of effect of the proposed peaker facility is zoned residential that is not yet built up. In addition, there is land zoned for agricultural uses within the incorporated areas surrounding the proposed facility that might become residential, and a very much greater amount of land in unincorporated areas which is not zoned by municipalities but might eventually be developed for residential use. If land potentially developable for residences becomes built up, and there is detraction from value of each of the new residences of the same magnitude as for existing residences, the effect on property values could be magnified many fold.

As evident from Figure 7 presented earlier, much land within range of effects of the peaker is not in residential use at the present time. Figure 8 is a land use map for Libertyville. The map suggests that much of the land within range of the peaker is zoned for non-residential use and so might never be developed residentially. Detailed zoning maps for Libertyville, Mundelein and Grayslake were used to identify those areas zoned residential that are not yet built up and so are candidates for future residential development. An analysis was conducted of possible effects of the peaker in discouraging some of this potential residential development. The only land used in the analysis was that zoned for single family residences in the three jurisdictions. Land zoned for multi-family residences and all the additional land potentially developable for residential purposes mentioned in the preceding paragraph were omitted from the analysis. These would greatly add to the effect calculated here.

Residential property values were re-calculated for each of the rings in Figure 7 assuming that land zoned for single family residences that is not now developed will become developed. Conservative assumptions of \$150 thousand per residence and two residences per acre were used. Detractions from property values due to the proposed peaker facility were re-calculated using the same method as described in the preceding part but assuming existence of the added residences.

The resulting estimated total loss in property value assuming areas zoned for single family residences become built up

is \$25.1 million. The total loss is approximately twice the loss calculated in the preceding part that was confined to existing residences only.

V. EFFECTS ON THE CHARACTER AND EXTENT OF FUTURE DEVELOPMENT

The fact that the area is made less desirable by the peaker facility will make the vicinity less desirable to higher income persons, who value the character of their neighborhood the most. The homes that will be built are likely to be of lower value than would be built in the absence of the peaker facility. If the blight-begets-blight principle takes hold, the neighborhood could become so undesirable, that all or part of it that would be developed for residences in the absence of the peaker facility would be precluded from any development at all.

Even though estimates become more conjectural here, this does not mean that the possibility of these events should be ignored. If the amount of residential development is curtailed, the entire value of the residences is lost to the area, not just the detraction from value of existing residences or residences that will actually be built.

The estimated market value of new residential property if land zoned for single family residences that is not now fully developed becomes fully developed is \$257 million. The value will be half this amount or \$128.4 million if discouragement due to the peaker results in only half of this land becoming developed. The loss in property value compared to what it would have been is then \$128.4 million from loss of new construction plus the loss on detraction from value on residences that will be in existence, which is equal to \$12.7 million on presently existing residences plus the loss of \$6.2 million on residences that still come into being. The total of the losses comes to \$147.3 million.

Losses from discouragement of new development may seem "iffy", but they represent real risks that need to be taken into account in assessing the future. A risk analysis should take this type of scenario into account. The losses are not certain, but they are from a scenario that has a definite chance of occurring. Building the facility would put the Libertyville area at definite risk of bearing these losses. The figures are suggestive of the extent to which the future development of Libertyville and adjacent communities would be put into jeopardy by the peaker.

Against the downside risks, there are no offsetting probabilities of upside gains. The only gains are the in-kind

gains if any that Indeck offers. They would be known with certainty at the time the plant is built. Unless the certain in-kind gifts are extremely large, they do not justify the down side risks. One is led to ask: Why take these risks when there are no probabilities of future gains?

VI. PROPERTY TAX REVENUES

Owners of property whose value is affected would not be the only ones to suffer losses because of the peaker. An effect of the detraction from property values would be to lower tax revenues for Libertyville and affected adjacent communities. The losses due to the peaker would fall partly on owners of affected properties and partly on taxpayers at large in the jurisdictions where the affected properties are located.

If a conservative property tax rate of 2.4 percent of market value of property is assumed, the yearly losses to taxpayers are 2.4 percent of the losses calculated in the preceding parts. Applying a 2.4 percent property tax rate, the range in yearly tax revenue losses is from \$306 thousand on existing residential properties to the suggestive risk if half of new residential development is discouraged of \$3.5 million.

The property tax losses are yearly losses since the property tax is collected every year. The present value of the losses is the capitalized value of losses that occur in every year. If the interest rate used to discount future revenue streams is 8 percent, then the present value of the losses is the yearly loss divided by .08. With the assumed property tax rate of 2.4 percent, the present value of the losses to taxpayers is 2.4 percent divided by .08 or 30 percent of the property value losses. The range in present value of tax revenue losses corresponding to the range in yearly losses considered in the preceding paragraph is \$3.8 million to \$44 million.

The present values represent for example the amount of a bond issue which could be paid off with the tax revenues. If the tax revenues were used to increase services on a yearly basis or reduce property tax rates to new levels that were continued year after year, the present value equivalent would amount to 30 percent of the property value loss.

VII. WHERE IS THE BEST PLACE TO BUILD A PEAKER?

Against losses that will almost certainly occur for existing properties, and risks of potential losses that as noted are many times greater than the losses to existing properties, what are the gains to the Libertyville and surrounding communities from

the peaker facility? It has already been established that there are no electricity gains. These gains go to the grid in general. Libertyville and surrounding communities will get their electricity in undiminished amounts regardless of whether the Libertyville peaker is built.

One would have to weigh any in-kind benefits promised to Libertyville from the owners of the facility to see if the benefits were enough to justify the risks of the property value losses and other deleterious environmental effects beyond property value losses being considered by others in these hearings.

From a public interest point of view, how can peak electricity demands best be met? The answer to this question depends on the existence of sites alternative to Libertyville. It is difficult to believe that there are not satisfactory sites outside the Chicago ozone non-attainment area away from existing or potential residential sites that would be preferable if one takes account of the costs imposed in the Libertyville area.

VIII. CONCLUSION

We have established that the proposed Libertyville peaker can be expected to have deleterious effects on values of residential property. A conservative estimate of the loss on presently developed residential properties is \$12.7 million. Risks of future losses could run to \$147.3 million. Yearly property tax revenue losses are estimated at 2.4 percent of these amounts. The present value of tax revenue losses is estimated at 2.4 percent divided by a discount rate of .08 giving a loss equal to 30 percent of losses to owners of directly affected properties. The range of present value of tax revenue losses is \$3.8 million to \$44 million.

Environmental and ecological considerations not reflected in property values are additional effects of the peaker not included in the present property value study.

We have pointed out the need to consider alternative sites taking account of costs and risks to receiving communities. It is reasonable to suppose that, taking account of these costs, sites other than in Libertyville, away from residential areas, would emerge as better places to build a peaker facility.

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