Successful Superfund Site Restoration: A Case Study of Independence Grove Forest Preserve

Linnea E. Hruska

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SUCCESSFUL SUPERFUND SITE RESTORATION: A CASE STUDY OF INDEPENDENCE GROVE FOREST PRESERVE

by

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Linnea E. Hruska
The United States Superfund program has been quite controversial since it was established under the Comprehensive Environmental Response, Compensation, and Liability Act in 1980. Several people feel that the enormous amounts of time and money invested in the Superfund program are not worthwhile because so many sites remain far from being cleaned up. Nevertheless, some successful site restorations have been achieved under this program. The Petersen Sand & Gravel site is one of these success stories. This thesis examines why the Petersen Sand & Gravel site was able to experience such success under the Superfund program by taking history, economics, local involvement, and other Superfund successes into account.

The Petersen Sand & Gravel site experienced success under the Superfund program because it was a “No Further Action” site, there had been a plan in place for its future use, one person was responsible for its contamination, numerous partnerships were formed, financial resources came from many different sources, and the community was kept well informed and supported the project. Hopefully lessons learned from this site's transformation can be applied to other Superfund sites across the country that remain heavily polluted, as well as to other restoration projects.
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CHAPTER 1

INTRODUCTION

As the population and prosperity of the United States has grown, so has the number of hazardous waste sites. The Superfund program was created in 1980 to address these sites and to work to clean them up and make them safe for other uses. However, the Superfund process is long and tedious; therefore, many hazardous sites remain contaminated. Many people believe that the Superfund program is not effective because many sites remain far from being restored to productive use. Further, the sites that have been cleaned up often required exorbitant investments of time and money during the Superfund process. Some successful site restorations have been achieved under the Superfund program, and the Petersen Sand & Gravel site is just one example. This site is located about forty miles north of Chicago in Lake County, Illinois. From 1952 until 1971, Raymond A. Petersen operated a gravel quarry and landfill at this site. The Lake County Forest Preserve District (LCFPD) purchased this property in 1978 with plans to create a recreational lake at the site. While the area continued to be mined, barrels containing hazardous materials were found. It was later discovered that Petersen had accepted the barrels and other trash in order to infill portions of the pit (USEPA 2004c). The LCFPD went through the Superfund process, and when the contamination had been successfully removed, a recreational lake was created at the site. This construction began in 1997 and the completed park, Independence Grove Forest Preserve, officially opened in 2001 (Musante 2002). This park has been nothing but an asset to the community since it opened, and it is now considered the “crown jewel” of the LCFPD (LCFPD 2004a).
Many Superfund sites remain polluted even though they have been on the Superfund National Priorities List (NPL) for many years. The purpose of my research was to determine why the Petersen Sand & Gravel site was able to experience such a successful transformation from a polluted landfill to a productive park. My first research objective was to explain why this site is considered a successful project. This included gathering information regarding whether or not all the pollutants had been removed from the site, if the site was safe for public use, how the park operated, and the extent of public satisfaction with the park. My second objective was to examine how the restoration process was completed. This involved examining the history of the site as well as that of the surrounding area. What were the local forces and agents beyond the site that aided the success of the Superfund cleanup? This objective also included the examination of how the LCFPD’s involvement aided the restoration of the site during and after the site’s inclusion in the Superfund program. A third objective was to look at the economics of the project. Money for the hazardous waste cleanup and the overall restoration process came from many different sources. Did sources in addition to the United States Environmental Protection Agency (USEPA) provide money for the cleanup of the site? How did this impact the process? My final objective was to examine what can be learned from this successful Superfund cleanup. Was the Petersen Sand & Gravel site restoration successful for the same reasons that other site restorations were successful? If it was successful for similar reasons, some trends for successful Superfund site restorations were identified. These trends or other information derived from the Petersen Sand & Gravel case study could then be applied to many Superfund sites across the country that remain heavily polluted.
The conversion of the Petersen Sand & Gravel site into Independence Grove Forest Preserve has been a success. It has quickly become the most visited LCFPD location, and is a source of competition for other local parks. The history of the Petersen Sand & Gravel site also played a major role in its successful restoration. Raymond A. Petersen, the head of the Petersen Sand & Gravel Company, was the one person responsible for the pollution at the site. This made it possible for both the LCFPD and USEPA to regain the money spent on the cleanup from Petersen. In addition, the LCFPD owned the land and already had plans to create a lake at the site before the contaminants were discovered. The fact that they had a vision for the site's future use played a major role in the success of its cleanup under the Superfund program. The partnerships the LCFPD formed with the Illinois Environmental Protection Agency (IEPA), USEPA, and the Lake County Grading Company were also important. The LCFPD's involvement helped push the project along, but it would not have been possible without the financial assistance of the IEPA and USEPA. Their partnership with the Lake County Grading Company was also important because it allowed mining to continue in order to gain additional funds and aid in the process of creating a lake at the site. The coincidental fact that both the LCFPD and Petersen had worked on the cleanup before the site was listed on the NPL also influenced its success. This led to the site being a "No Further Action" site because all of the contaminants had been removed sufficiently during previous removal actions. In addition, the fact that the LCFPD kept the local community informed about their plans also assisted in the site's successful transformation because it garnered public support of the project. The most important factors in the successful restoration of the Petersen Sand & Gravel site were: (1) the LCFPD had a plan in place for the site; (2)
many partnerships were formed; (3) Petersen was the only person responsible for the contamination; (4) financial resources came from a variety of sources; (5) all the contaminants had been removed before the Superfund process began, thus making it a “No Further Action” site, and (6) the local residents were kept well informed; therefore, most supported the project.
CHAPTER 2

BACKGROUND INFORMATION

General Literature Review

The literature related to landscape restoration is extensive. This literature examines what restoration is, the production of landscapes, the effects and importance of history on restoration, and the concept of "futuristic" restoration. Literature about specific case studies concerning restoring mining sites, converting brownfield sites into parks, and redeveloping Superfund sites into parks and for other various uses is also available. There is also some literature about a Superfund site in Wichita, Kansas that had plans in mind for the area before hazardous materials were found. Some literature also addresses why some Superfund site restorations may have been more successful than others.

Independence Grove is considered a forest preserve, but it is more of a restoration than preservation. Often times restoration is an alternative to preservation. Katz (1998) explained Alexander Wilson's ideas about restoration in her article Whose Nature, Whose Culture? Private Productions of Space and the Preservation of Nature. She explained that "Rather than 'saving what's left,' he (Wilson) suggests that environmental politics center on 'repairing' ruptures in the landscape and 'reconnecting' its parts" (Katz 1998, 56). These ideas could be applied to Independence Grove. Since preservation was obviously not possible at the site, the Forest Preserve District chose to restore the site to something more "natural" instead. Since it was now a Forest Preserve site, this restoration would then be preserved in the future.
There is also some available literature about landscape production. Landscapes often hide the things that make it, and therefore, hide its history. In his book *Cultural Geography: A Critical Introduction*, Mitchell (2000, 93-94) explained that “...the landscape itself is an active agent in constituting that history, serving both as a symbol for the needs and desires of the people who live in it (or who otherwise have a stake in producing and maintaining it) and as a solid, dead weight channeling change in this way and not that.” The landscape itself can hide its own history because a landscape is a work and something that does work (Mitchell 2000). This might be applied to Independence Grove because it has had a long history, but most of it seems to remain hidden by the produced landscape of the park.

Some literature also addresses that the history of a place is an important element in the process of understanding how it is today. In Lippard’s (1997) *The Lure of the Local: Senses of Place in a Multicentered Society*, she quoted Glassie’s view of place. He wrote, “History is the essence of the idea of place. In place, the person is part of the history” (Lippard 1997, 13). Therefore, history is a very important aspect of place even though many people do not always think about the history of a place. It is easy to not even think about the history of a place because the landscape itself often hides this history. The history of Independence Grove Forest Preserve tells a great deal about how it is today, but many people do not stop to think about this history. If more people knew this history, perhaps they would have a different view or a better understanding of this site. Knowing its history also might help one realize why it was successfully restored.

Jordan (1994) offers a useful model that emphasizes that the past plays an important role in the process of ecological restoration. Ecological restoration “provides
access to several octaves of historic experience: the immediate experience of the individual in a particular place; the usually longer history of the community and of a particular society or civilization; the still deeper history of cultural evolution; and ultimately the ‘history’ of nature as chronicled by students of evolution and biogeography” (Jordan 1994, 25). In order to successfully restore a site, one needs to understand how the area was changed in the past so that these changes can be reversed (Jordan 1994). Even though the Independence Grove Forest Preserve site was not restored to its original state, it was transformed from a toxic Superfund site to a productive park.

Choi (2004, 77) provides various definitions of ecological restoration, including “the return of an ecosystem to a close approximation of its condition prior to disturbance,” the “process of repairing damage caused by humans to the diversity and dynamics of indigenous ecosystems,” and “intentional alteration of a site to establish a defined indigenous, historic ecosystem.” However, these types of ecological restoration are often not possible “because (i) it is rarely possible to determine what historic or prehistoric ecosystems looked like or how they functioned; (ii) ecological damage is irreversible for certain sites; (iii) economic and social costs may be prohibitive; and (iv) our understanding of natural processes, despite tremendous advancement in recent centuries, is limited” (Choi 2004, 77). Independence Grove would fit under a few of these categories, especially the one about how ecological damage is sometimes irreversible. Choi also explained that many restoration attempts are unsuccessful because of these constraints or because of other unrealistic restoration goals. He proposed the idea of “futuristic” restoration because “a successfully restored ecosystem should be able
to function adequately with the present and the future, not with the past environment” (Choi 2004, 78). Independence Grove could be an example of a futuristic restoration because it was not restored to its original state. Its entire reconstruction was focused on its planned future use as a recreational site.

There is a great deal of literature that examines the restoration of specific sites. Some of this literature specifically addresses the reclamation of mining sites. In the document “Reclamation Planning of Pits and Quarries,” Bauer (2000) provided brief descriptions of reclaimed mining sites. Some of these sites now contain housing, office parks, golf courses, gardens, amphitheaters, and parks. One site that is very similar to Independence Grove is Dayton, Ohio’s Madison Lake County Park. In the 1970s, the Montgomery County Parks and Recreation Department purchased this site with the understanding that the mining company would assist with the reclamation work. Mining continued next to the park, and it still does today. This park contains many of the same recreational opportunities as Independence Grove, including fishing, boating, picnicking, and hiking. The development of the park also encountered problems, but they were very different from Independence Grove’s troubles. One of the main problems was that the water was too clean to sustain fish life, but this problem was solved through depositing topsoil in the lake and some applications of fertilizer (Bauer 2000). While sites such as these were also once gravel pits or quarries like Independence Grove, they did not face the additional challenge of being contaminated with hazardous materials.

Some more general literature discusses the conversion of various types of brownfields into parks. One example is Crissy Field in the San Francisco Bay area. This site was once a military airfield and an industrial storage yard. The National Park Service
transformed the site into an urban park. The Golden Gate National Parks Association (GGNPA) funded most of the project, and they also received financial support from many community stakeholders. The author explained that "...the GGNPA sought input from a variety of community stakeholders and oversaw the Crissy Field restoration, in this way introducing more flexibility, innovation, and speed into the process than if it had been managed by federal agencies. The project was funded mostly by private contributions..." (Porter 2003, 41). This may be a reason why this restoration was so successful. Many toxic and hazardous materials were found at the site, but it was never declared a Superfund site. This was because United States Department of Defense is responsible for cleaning up hazardous waste at closed military bases. The fact that they were held responsible for the cleanup may have been another reason for its success. Toxic military remains, contaminated soil, and other materials had to be removed during the restoration of this site. Various engineering works, native plantings, and recreation of a marsh were just some activities that were undertaken during the restoration process. Many volunteers also helped transform the site into a park (Porter 2003). This site has some similarities to Independence Grove, but the main difference is that it was not a Superfund site even though it contained some hazardous materials.

There is also a great deal of literature available on the Superfund Act and various sites that have been successful under the program. Restored sites are now productive as industrial centers, shopping malls, offices, hotels, and parks (Meyer et al. 1995). One example of a Superfund site that is now a park is the Kerr-McGee site near Chicago, Illinois. The only difference between the Kerr-McGee site and Independence Grove and was that Kerr-McGee was already a park when the contamination was found. A former
sand and gravel quarry at this site once contained a landfill for thorium mill tailings from the Kerr-McGee Rare Earths Facility. In 1976, excessive levels of contamination were found at the site. The Kerr-McGee site was placed on the NPL, but work to remove the contamination did not begin until 1997. Temporary measures such as creating new parking areas and roads were taken so that the park could still be used while the cleanup work was completed. The cleanup efforts involved close cooperation between many different groups, including the USEPA and IEPA, the Kerr-McGee Chemical Corporation, the city of West Chicago, the West Chicago Park District, and community residents. It was finally completed in November of 2000. Today the site is part of Reed-Keppler Park. It is part of the Illinois Prairie Path, a fifty-five mile recreational trail, and it also contains sports fields, a swimming pool, and picnic areas (USEPA 2003a). This site is very similar to Independence Grove except that it was already a park when the past contamination was discovered.

Meyer et al. (1995) described a site that was similar to Independence Grove in that hazardous materials were found after future plans had already been implemented. In Wichita, Kansas, the central business district was in the middle of a revitalization project in 1990. The project was delayed because six square miles of groundwater contamination was discovered. At this time the site was added to the NPL and became known as the Gilbert-Mosely site. Because they wanted their initial plans to move forward as soon as possible, the city manager and city council formed a coalition of local government and businesses (Meyer et al. 1995). The city government accepted leadership for the environmental cleanup of this site. The primary person responsible for the contamination entered into a partnership with the local government and agreed to accept liability for the
site's cleanup. Partnerships with an environmental consultant and financial institutions also helped lead the site to a successful restoration. Two citizen participation committees were also formed to help keep the community involved and to get feedback about the project. Tax increment financing (TIF) was also used to pay for cleanup costs that could not be assigned to a specific party. While some of these methods could be applied to other Superfund sites, not all of them would be applicable to every site. However, the article "Economic and Environmental Repair in the Shadow of Superfund: Local Government Leadership in Building Strategic Partnerships" (Glaser 1994) did give a few general guidelines that worked for the Gilbert-Mosely site and that could be applied to other sites. These guidelines included innovation and risk taking within local government, cooperation with local financial institutions, creative community partnerships, and strong local leadership. Perhaps some of these explanations for success would also apply to the successful restoration at Independence Grove.

Rafson and Rafson (1999) explained that there is no one single "recipe" for the successful redevelopment of a brownfield site, but there are some factors that many successes have had in common. While this study did not look specifically at Superfund sites, this information could be applied to such places as well because they are also invariably brownfields. Some reasons for success that were outlined include:

- presence of a strong local government entity
- involvement by personnel from a variety of departments
- public-private partnerships
- key individuals with strong leadership skills
- streamlining interagency coordination
• strong community participation
• fitting the project together with the community’s vision
• state voluntary cleanup programs
• clarity between the state and USEPA in terms of liability relief
• favorable location and market conditions
• “piggybacking” onto public works projects
• financial assistance from the public sector
• some private sector financial involvement (Rafson and Rafson 1999).

Meyer et al. (1995) also provided common factors specifically for the successful restoration of Superfund sites. Some of these themes were: cooperative public-private partnerships involving developers, lenders, community organizations, state and federal regulators, and other local and state government officials. The authors also explained that “the projects entail creative combinations of funding methods such as tax increment financing, state loan funds, joint ventures, and application of property cleanup tax credit” (Meyer et al. 1995, 99). These common explanations for Superfund success stories could be applied to Independence Grove to determine if they also played a role in its successful restoration.

While some literature has attempted to explain why certain Superfund site restorations have been successful, there are no clear-cut explanations that could be applied to every site. The analysis of why the restoration of the Petersen Sand & Gravel site was successful could either support these existing explanations or add additional ones. If some explanations for success are true in many cases, some general guidelines for the successful restoration of Superfund sites could be developed. Other Superfund
sites could then use the procedures adopted at the Petersen Sand & Gravel site, or the more general guidelines that contributed to success at multiple sites, as a model for their cleanup efforts. If more people focus on the Superfund sites that have been successfully restored in the past, this will aid in more sites being cleaned up and removed from the NPL in the future. Not much literature has looked at the role a site’s history has played in its successful restoration. Since the history of a site is very important, I looked at the history of the Petersen Sand & Gravel site and how it may have contributed to this site’s successful restoration. It was also necessary to examine the history of the local community because what was going on in the surrounding area at that time may have also played a role in the site’s restoration. My research also examined more general ideas about landscape restoration such as the concept of “futuristic” restoration because these theories are applicable to Superfund sites such as the Petersen Sand & Gravel site.

Superfund Program

Creation of Superfund Program

The Superfund program was specifically created in response to the now famous Love Canal hazardous waste site. The Hooker Chemical Corporation had buried twenty-two thousand tons of hazardous waste in a trench called Love Canal in Niagara Falls, New York during the 1940s and early 1950s. Years later, homes, a playground, and an elementary school were constructed on top of and next to the buried hazardous waste. In the late 1970s, the waste was finally discovered. One nearby resident found toxic contaminants in her basement. In addition, there was occasionally a bad smell in the neighborhood, and many residents began connecting various illnesses to the buried
wastes. Led by Lois Gibbs, the residents of Niagara Falls tried to get the government to clean up the hazardous waste, as well as to compensate them so they could move away from the area. The residents' efforts finally paid off when the government declared their situation an emergency and money was made available for them to move away from the contamination (McGowan 2001). The situation at Love Canal received national coverage; therefore, many people became concerned with hazardous waste sites across the country. Many people believed that there should be a federal program in place to handle similar emergencies in the future. In response the government created the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), which President Carter signed into law on December 11, 1980. Commonly known as the Superfund law, CERCLA was the first national law that was mainly concerned with cleaning up hazardous waste sites (McGowan 2001).

Superfund gave the federal government the responsibility for identifying and cleaning up the worst hazardous waste sites in the country. The USEPA was made responsible for overseeing the Superfund cleanups. The Superfund law set up a special government trust fund where money would be set aside to deal with hazardous waste emergencies like Love Canal (McGowan 2001). These funds come from taxes on petroleum and chemical industries, general tax revenues, and an environmental tax on corporations. Obviously these funds are not enough to clean up every polluted site. At times funds are obtained from current or previous owners of the site, or a potentially responsible party (PRP) that may have been responsible for the contamination (Goldsteen 2003). Whenever possible, the companies responsible for the contamination are required
to pay for the cleanup. Therefore, taxpayers are not burdened by these cleanup costs (McGowan 2001).

**Superfund Process**

The first step in the Superfund process is the reporting of a contaminated site. This may be done by many different parties, including citizens, state agencies, environmental groups, or corporations (Crawford 1997). Next, the USEPA conducts a Preliminary Assessment/Site Inspection (PA/SI) to investigate the contamination that was reported (USEPA 2004b). The Preliminary Assessment (PA) involves collecting available data about the site in question. The purpose of the PA is to distinguish between sites that do not pose a threat and those that may pose a threat and therefore require further investigation. If a site may pose a threat to the environment or human health, then a site inspection is completed. A site inspection (SI) involves collecting samples to determine what hazardous substances are present, and if they have spread. The site inspection often includes two stages. The first stage is called the focused SI and it tests hypotheses that were made during the PA. This stage can gather information for a Hazard Ranking System (HRS) score. The second stage, an expanded SI, includes collecting additional information for an HRS score. If a site has an HRS score of 28.5 or greater, it is eligible for the National Priorities List (NPL), and an HRS scoring package must be prepared (USEPA 2004b).

The HRS assigns numerical values to factors that relate to risk based on characteristics of the site. These factors are put into three categories: (1) likelihood that a site has released or has the potential to release hazardous substances into the
environment; (2) characteristics of the waste such as toxicity and quantity; and (3) people or sensitive environments that could be affected by the release of hazardous materials.

Four pathways of exposure are also scored under the HRS: (1) ground water migration, (2) surface water migration, (3) soil exposure, and (4) air migration. After these scores are collected, they are combined into an overall site score by using a root-mean-square equation. Again, if a site obtains an HRS score of 28.5 or greater, it can be placed on the NPL (USEPA 2004b). However, sites that receive a high HRS score are not automatically placed on the NPL (Probst et al 2001).

After a site receives an HRS score of at least 28.5, additional review and screening are performed at the site. Next, if a site gets to this point, a formal listing package is prepared and the site is proposed for inclusion on the NPL. During this process, the USEPA regional staff is required to submit an HRS package to the USEPA headquarters for a review. After USEPA headquarters has reviewed the data, they may, along with the USEPA regional office and the governor of the state in which the site is located, propose the site for listing on the NPL. The USEPA then publishes a list of proposed sites in the Federal Register. Once a site is proposed to be on the NPL, a sixty-day public comment period is established. After the comments from this period have been considered and other interested parties have been contacted, the USEPA compiles a final rule. This rule is then signed by the Assistant Administrator of the Agency's Office of Solid Waste and Emergency Response (OSWER) and published in the Federal Register. At this point a site is officially on the NPL (Probst et al. 2001). Because of the many steps involved, many assessments become stalled.
There are two other ways that a site can be placed on the NPL. CERCLA allows each state to add one site to the NPL, designating it as its top priority. Forty sites have been added to the NPL in this manner. Another method of placing sites on the NPL is if the Agency for Toxic Substances and Disease Registry issues a health advisory that "recommends people avoid contact with a release, USEPA determines the release poses a significant threat to public health, and it is more cost effective for USEPA to use its remedial authority than its removal authority to respond to the release" (Probst et al. 2001, 80). Thirteen sites have been added to the NPL through this avenue (Probst et al. 2001).

Once a site is placed on the NPL, a remedial investigation/feasibility study (RI/FS) is conducted at the site. The first phase in the RI/FS process is scoping. This phase includes collecting existing site data, identifying preliminary study area boundaries, identifying possible remedial action objectives, and establishing whether the site should be split into pieces before remediation begins. The next phase, site characterization, includes field sampling and laboratory analyses in order to develop a baseline risk assessment to identify any existing or potential risks to human health and the environment. The development and screening of alternatives is the next phase, and it involves developing alternative actions that could be performed at the site. This process includes identifying remedial action objectives; identifying potential means that will satisfy these objectives; screening the potential means based on their effectiveness, implementability, and cost; and developing alternatives based on the potential cleanup methods. Next, treatability investigations are conducted in order to provide data so that the treatment alternatives can be fully developed, support the remedial design of selected
alternatives, and reduce cost and performance uncertainties for treatment alternatives to acceptable levels so that a remedy can be selected. The final stage in the RI/FS process is detailed analysis. During this phase the alternatives are evaluated against nine criteria. These criteria include: protection of human health and the environment in general; observance of Applicable or Relevant and Appropriate Requirements (ARARs); overall durability; reduction in hazardousness, mobility, or amount of waste; short-term effectiveness; the possibility of it being executed; cost; State acceptance; and community acceptance. The results of this phase are summarized so that an appropriate remedy can later be selected (USEPA 2004b).

After an RI/FS is conducted, the next step is to complete a Record of Decision (ROD). An ROD is done in order to outline the possible cleanup alternatives, and identify which of these alternatives is the preferred action. Finally, a Remedial Design/Remedial Action (RD/RA) is prepared. The RD describes how the preferred alternative from the ROD will be implemented, and the RA includes the remedial design phase and the actual implementation of the site cleanup (USEPA 2004b). At this point the actual cleanup of the site can begin. Cleanup processes take on many different methods, including removal or treatment of the waste, bioremediation, chemical transformation, and natural attenuation (USEPA 2003b).

A site is complete when the cleanup levels in the ROD have been met, it does not pose any threats to human health or the environment, the solution is practical and within design specifications, and only Operation and Maintenance (O & M) activities still need to be completed at the site. To show that all of these criteria have been satisfied, a Superfund Site Close Out Report is completed for each NPL site (USEPA 1989). The
Regional Administrator approves this report, and then the Regional Office gets agreement from the State. Next, the USEPA publishes a notice of intent to delete the site from the NPL in the Federal Register. The notice of intent to delete is also published in one of the community’s local newspapers because a public comment period follows the notice of intent (USEPA 2004a). If the public provides any comments, the USEPA responds to them in a Responsiveness Summary. If the site still calls to be deleted, the USEPA publishes a deletion notice in the Federal Register. Nevertheless, the site would not actually be delisted until the next official NPL rulemaking (Adamkus 1989). Deleted sites are still eligible for Superfund-financed remedial action if they ever need it in the future. The USEPA started a new policy in November of 1995 where part of an NPL site can be deleted and reused while the remainder of the site still needs some cleanup action before it can be deleted.

The USEPA created the Construction Completion List (CCL) in 1993 to help the public understand the Superfund process and to show that Superfund has been successfully implemented at some sites (USEPA 2004a). A site is defined as construction complete when the “physical construction of all cleanup actions are complete, all immediate threats have been addressed, and all long-term threats are under control” (Probst et al. 2001, 37). Post-construction completion activities often include monitoring, maintenance, reviews, and final deletion from the NPL. These activities are performed to make sure human health and the environment will have long-term protection (USEPA 2004b). At times, post-construction activities will need to continue for many years before the site is actually deleted from the NPL (USEPA 1989).
Not all Superfund sites go through the NPL listing process. Sites that pose immediate threats to public health and the environment need short-term responses. The Superfund Emergency Response program makes sure that a response system is in place and ready to respond immediately should an emergency occur at any location. Actions that have been performed as part of this program include providing people with safe drinking water when theirs had been contaminated, moving people living near very hazardous sites to temporary housing, and treating contaminated soil, liquids, and water. However, more people focus on long-term remedial actions than these emergency response cases because they often involve a very long cleanup process (USEPA 2004f).

Each state is also allowed to designate one site as its top priority. The HRS score that the site received does not matter. Forty-one of the 57 U.S. states and territories have chosen a top-priority site, and fifteen of the chosen sites have been deleted from the NPL. A site can also be placed on the NPL if it meets all of the following criteria: the Agency for Toxic Substances and Disease Registry (ATSDR) has issued a health advisory that recommended people be removed from the site, the USEPA establishes that it poses a threat to public health, and the USEPA believes that it will be more cost-effective to take care of the site under the NPL than as an emergency removal. Thirteen sites have been placed on the NPL in this manner (USEPA 2004a).

The early years of the Superfund program were not successful, mainly because Ronald Reagan named controversial individuals to direct the USEPA and its toxic waste programs. In 1982, an investigation into the situation found “evidence of cronyism with industry, illegal private meetings with representatives of regulated companies, and sweetheart deals in which chemical waste dumpers were allowed to settle with the agency
at a fraction of what it would cost to clean up the dangerous mess they had created” (McGowan 2001, 44). After the investigation, new leadership was established, but the Superfund program was still not very successful. By 1986, only six sites across the country had been cleaned up. In that same year, Congress agreed to raise the money available in the trust fund from $1.6 billion to $8.5 billion. Congress also gave the USEPA and the President more power to force companies to pay for cleanups. These provisions were made with hope for increased success of the program. While the Superfund program became more successful, it was far from being flawless (McGowan 2001).

Some companies do not agree with Superfund because they could be forced to pay for contamination that another company caused. Superfund operates under “joint and several liability,” meaning that one company could be forced to pay for hazardous waste at a site where many different companies had dumped hazardous materials. Some people believe that each company should be forced to pay for the exact amount of contamination that they caused; however, it is usually very difficult to determine who is responsible for specific contaminants. For example, many different people could have dumped hazardous materials into a landfill, thereby making it extremely difficult to determine responsibility. In addition, contamination often took place many years ago, and often times records that show who was responsible for the contamination do not exist. Companies sometimes end up going to court over exactly how much waste they were responsible for and what they should have to pay for cleaning it up. The USEPA has made some provisions to assist companies responsible for contamination. First, the USEPA can pay “orphan shares” to make up for the difference between what a company
is responsible for and the total cleanup cost. If a company has contributed to less than one percent of the contamination, the USEPA will also allow them to pay a small fee and then be released from responsibility. In addition, companies who are responsible for a very small amount of the contamination may be completely released from responsibility (McGowan 2001).

Superfund Success Stories

There have been over 240 Superfund success stories, and over 130 of them include new uses for the site. A site must be cleaned up and proven safe before it can be reused. There are five steps the USEPA takes to make sure a site is safe:

- investigation of the site to see if the contamination threatens human health or the environment and what the nature and extent of the contamination is
- meeting with site owner, community, and interested parties to discuss possible future uses of the site
- selection of a cleanup strategy for that particular site with future use in mind, as well as public comments on the strategy
- site cleanup until area is safe for new use
- monitoring of the site

Strategies for cleanup have included removal, treatment, recycling, containment, thermal treatment, solidification, stabilization, bioremediation, chemical transformation, and natural attenuation. New uses for sites include commercial, ecological, recreational, public service, residential, and agricultural activities. Figure 1 shows how each of the 240 successful Superfund sites are now being used. Since some sites have more than one
use, the total number of uses is greater than 240 (USEPA 2003b). The Petersen Sand & Gravel site is an example of one of these successful Superfund site transformations because this site, once a polluted gravel pit and landfill, is now Independence Grove Forest Preserve.

![Graph: Productive Uses of Superfund Sites](image)

**Figure 1: Productive Uses of Superfund Sites**
Source: USEPA 2003b

Many Superfund sites that were similar to the Petersen Sand & Gravel site have been successfully removed from the NPL and converted into a productive use. Chisman Creek, Virginia is one of these sites. Baseball and soccer fields now exist on what was once an area of abandoned, contaminated sand and gravel pits (USEPA 2003b). From 1957 to 1974, fly ash from the Yorktown Power Generating Station was deposited into
four abandoned sand and gravel pits in York County, Virginia. In 1980, a local homeowner reported seeing discolored well water in the area so residential wells and surface water in the area were sampled. The analysis of these samples found high levels of heavy metals in the water. Virginia Power, the potentially responsible party (PRP), first provided local residents with clean water. This company also agreed to construct a clay cap over the contaminated soil and a collection and treatment system for groundwater (USEPA 2005a). A committee made up of professionals as well as local residents supervised the cleanup and redevelopment of the site. This committee thought that a sports park would be the best use of the site. The partnership between the USEPA, York County, and Virginia Power that worked to clean and redevelop the site won an Environmental Achievement Award from the National Environmental Awards Council (USEPA 2003b). The site is reviewed at least once every five years because hazardous substances still exist in the area (USEPA 2005a).

The DuPage County Landfill/Blackwell Forest Preserve is another Superfund site that has been successfully restored to a productive use. This site is located in Warrenville, Illinois. It was originally an abandoned gravel pit that the DuPage County Forest Preserve District (DCFPD) purchased in 1960. The DCFPD wanted to transform the gravel pit into a place suitable for recreation by first using it as a landfill. Gravel mining also took place from 1963 through 1969 as a way to provide money and fill material for the reclamation project. The DCFPD then decided to make it an aboveground landfill. Many concerns came along with this idea, but it was implemented and then completed in 1973. Brown leachate was first spotted in the area in 1980, but samples taken at that time did not show any signs of contamination (Illinois Department
of Public Health 1997). In 1990, the contamination caused by the site was bad enough to have it listed on the NPL. A cap was placed over the landfill, gas vents installed, and groundwater continued to be monitored. These actions were successful in making the site safe for recreation. The landfill is now part of the Blackwell Forest Preserve, and it is used for picnicking, hiking, camping, boating, and sledding. The relationship between the USEPA, Illinois Environmental Protection Agency (IEPA), and DCFPD is seen as one of the most important factors in the success of this preserve (USEPA 2004e).

The Army Creek Landfill in New Castle County, Delaware has also experienced success under the Superfund program. This site had been an abandoned sand and gravel quarry when landfill operations began there in 1960. It functioned as a landfill until 1968, and by that time it contained approximately two million cubic yards of waste. Contamination was found in a well near the site in 1971. The county set up a system to prevent the contamination of groundwater used in nearby residential areas. The site was added to the NPL in 1983. The USEPA believed putting a multi-layer cap over the site and setting up a water treatment facility would be the best cleanup method. During the cleanup process, the USEPA thought about future uses for the site. They discussed the various options with local natural resource trustees, and decided the best option would be to convert the site into a bird and wildlife habitat. This idea for future use was included in the design of the landfill cap. Vegetation was planted, bird boxes installed, and wetland areas created as part of the site’s renovation. The key to the success of this project was the partnerships among the USEPA, local natural resource trustees, the US Fish and Wildlife Service, and the Delaware Division of Fish and Wildlife (USEPA 2004d).
A site that was mainly transformed for recreational purposes was the Old Works/East Anaconda Smelter site in Deer Lodge County, Montana. The Anaconda Smelter operations began in 1884. The operation was very successful, and was one of the main producers of copper. In 1980, the smelter closed, leaving behind millions of cubic yards of soil and flue dust that were contaminated with heavy metals. The USEPA worked with the county, the property owners (ARCO), and the local community to develop a cleanup plan, as well as a redevelopment plan. The plan included the construction of a golf course on part of the site, after first installing a soil cap over the contaminants, then planting vegetation, and putting in a drainage system. This was another case where the partnerships that were formed were a primary reason for the site’s successful redevelopment. In this case, the partnerships that existed between the USEPA, ARCO, and the local community played a very important role in the redevelopment of the Anaconda Smelter site (USEPA 2004d).

The above case studies highlight some successful restorations of Superfund sites into productive uses similar to Independence Grove Forest Preserve. Many of the variables that led to the successful restoration of these sites are the same variables that contributed to the Petersen Sand & Gravel site’s successful transformation. Chapter 3 examines the entire history of the Petersen Sand & Gravel site, and Chapter 4 analyzes the factors that assisted its conversion into Independence Grove Forest Preserve.
CHAPTER 3

CASE STUDY

Description of Study Site

The Petersen Sand & Gravel site, now Independence Grove Forest Preserve, is located about forty miles north of Chicago in central Lake County, Illinois (Figure 2). It is specifically located east of the Des Plaines River and just north of Route 137 in Libertyville, Illinois (Figure 3). From 1952 until 1971, Raymond A. Petersen operated a gravel quarry and a landfill at this site. The Lake County Forest Preserve District purchased the property in 1978 with plans to create a recreational lake at the site. While the area continued to be mined, barrels containing hazardous materials were found. It was later discovered that Petersen had accepted the barrels and other trash in order to infill portions of the gravel pit. In 1984, the site was placed on the NPL of sites included in the Superfund program. The cleanup process took about seven years, and the site was finally removed from the NPL in 1991 (USEPA 2004c). The Forest Preserve District began the actual construction of the lake in 1997 and the completed park, Independence Grove Forest Preserve, officially opened in 2001. The costs of constructing the park totaled $14.188 million. Two and a half million dollars came from a 1993 county referendum, $6 million came from a 1999 county referendum, $1.55 million came from grants, and $4.138 million came from gravel mining royalties (Musante 2002) (see Appendix for a timeline of major events in the site’s history).

Independence Grove currently features a 115-acre lake for swimming, fishing, and boating, a 19,000-square-foot Visitor’s Center, an amphitheater, a fountain, a native
Figure 2: Location of Independence Grove Forest Preserve
Source: ESRI
plant garden, picnic pavilions, sand volleyball courts, and many trails. Many youth day

camps and school field trips come to the preserve for various educational programs
throughout the year. Today Independence Grove Forest Preserve is considered the
"crown jewel" of the Forest Preserve District because it offers these many recreational
and educational opportunities for residents of Lake County and other surrounding
communities (LCFPD 2004a).

Figure 3: Petersen Sand & Gravel Site Location
Source: USEPA 1988
The site that contains Independence Grove is part of the Des Plaines River Valley. This valley is located between two glacial moraines that run north to south. These ridges contain large amounts of silty clay and clay till. The valley, especially in the southern half of the site, contains sand and gravel deposits, stream deposited alluvium, and glacial till. These deposits were most likely deposited about 12,000 years ago by the glacial meltwater at the end of the last ice age. When the land was originally surveyed, the land west of the river was prairie with scattered oak trees while lands to the east were forested with walnut, red oak, elm, hickory, white oak, black oak, and bur oak trees. Two small portions of these forests still exist within the preserve today. One is a thirty-six acre section at the intersection of River Road and Route 137 that consists of mixed hardwoods including: sugar maple, basswood, red oak, white oak, and white ash. The second area is a 110-acre section to the north of the main gravel mining operation off River Road. This area, often referred to as Camp Saint Francis Woods, is composed of sugar maple, white oak, shagbark hickory, red oak, black walnut, bitternut, and white ash trees. The floodplain of the Des Plaines River covers a large area between the River and Route 21. The intersection of Routes 21 and 137 were reforested with oak, walnut, and pine in 1978. Two streams that empty into the Des Plaines River, Bull’s Brook and Wynkoop (Bull) Creek, are located in what is now the western part of the preserve (LCFPD 1992).

Milwaukee Avenue (Route 21), which forms the western border of the preserve, was one of the earliest roads in Lake County. In 1836, it became the first state road in Lake County. Many early land claims were made along this road. It was a good area for settlement because in addition to road access, the prairie lands were good for agriculture,
the river provided water for cattle, and the forested areas provided timber for buildings and firewood. In 1835, Tobias Wynkoop constructed a cabin near the confluence of the Des Plaines River and what is now Bull Creek (LCFPD 1992). This area had many trees and it came to be known as Wynkoop’s Point. However, in 1841, Wynkoop had to give up the land because he could not afford to buy the land title for it from the federal government. E.T. and C.T. Bull owned much of the land in this area in 1861. William Boardman, G. Van Alstine, H. Butler, R. Bulkley, and E.W. Woolridge also owned land here at that time. During the mid-1800s, land east of the river was subdivided into timber lots. This gave farmers from the prairie areas access to timber for fence and home construction. Some of the timber lots were completely cleared and farmed. The land within the preserve was mainly used for agricultural purposes into the 1900s (LCFPD 1992).

The land also began to be used for other activities during the early 1900s. In 1925, Britton Budd purchased eighty acres of land along River Road from the Soloman Kelsey family and created the Katherine Kreigh Budd Memorial Home for Children in memory of his wife. Later, the Home was owned by the Doddridge Farm Association, and then the Christian Youth Organization of the Archdiocese of Chicago. These organizations used the site for summertime activities and an overnight camp for children called Camp Saint Francis Woods. All of these buildings have since been removed. The LCFPD ended up buying this land from the Archdiocese of Chicago in 1982 (LCFPD 1992).
Contamination of Site and Cleanup Process

In 1952, Raymond A. Petersen purchased approximately thirty acres of land west of the Des Plaines River, as well as twenty acres east of the river. He began mining both areas that same year. He stopped mining to the west of the river in 1960 and built a house on this property (Planning Research Corporation 1987). In 1955, Petersen began to allow customers and others to dump waste on part of the property east of the river (Illinois Pollution Control Board 1973). This waste material consisted of construction debris, trees, tires, and other non-hazardous materials. At some point hazardous materials were also accepted, but it is not clear exactly when this occurred. Petersen expanded his mining operation on the property a few times. In 1958, he leased ninety acres east of the twenty acres he had on the east side of the Des Plaines River from the First National Bank of Lake Forest. In 1964, he expanded again when he leased 130 acres south of his current holding from the Catholic Youth Organization (Planning Research Corporation 1987). During the 1960s, elm tree logs and branches were used to fill in the pit because they had died as a result of the Dutch Elm Disease epidemic that claimed most of the elm trees in northern Illinois (LCFPD 1992).

The Lake County Health Department (LCHD) became aware of the fact that refuse was being dumped in the Petersen pit in December of 1968. The LCHD contacted Petersen in 1969 and informed him that he needed a permit in order to operate a sanitary landfill; therefore, he should not accept any more trash until he got such a permit (Planning Research Corporation 1987). After another inspection in May of 1969, Petersen was told again that he needed to obtain a permit in order to continue landfilling. The LCHD noted tires, paint cans, auto body parts, plastic remnants, mattresses, couches,
wood, boxes, brush, roots, construction debris, household garbage, and galvanized pipe in
the pit during a June 1969 inspection. Some of the refuse was seen burning during this
inspection. Garbage and old lumber were supposedly added to the pit during 1970
(Planning Research Corporation 1988).

Petersen did not apply for a landfill permit until 1971, but was denied because the
high permeability of the sand and gravel could contribute to contamination of the nearby
Des Plaines River (Planning Research Corporation 1987). He later reported that he
continued to landfill illegally until June 15, 1971. More information about the material
that was dumped in the pit was not discovered until many years later. In 1984, a truck
driver reported that he had brought waste from a paint company to the site from 1970 to
1972. Neighbors apparently saw approximately 50 liquid-filled drums dumped into the
pit in 1971. There have also been reports that oil was disposed of at the site sometime
between July 1, 1970 and October 12, 1971. Petersen later explained that the only oil
used at the site was oil that was thinly spread to control dust on the roads, and that none
was put down within 50 feet of the river (Planning Research Corporation 1988). In short,
Petersen had committed many violations, including allowing dumping of refuse, failure
to confine dumping to the smallest practical area, failure to spread and compact refuse,
failure to cover exposed refuse, allowing refuse to be deposited in standing water, and
allowing contaminants to be dumped in a manner that created a water pollution hazard
(Illinois Pollution Control Board 1973). In a June 1972 proceeding, the Illinois Pollution
Control Board (IPCB) ordered that the site no longer be allowed to accept refuse, all of
the existing refuse be covered, any refuse that was in standing water or that posed a water
pollution hazard be removed, Petersen cooperate in future inspections of the site, install a
monitoring well, and pay the State of Illinois $300. This amount was later increased to $1000 on August 23, 1973, but is unclear why it was increased (Planning Research Corporation 1988). Nevertheless, the amount of the fine was shockingly small considering that future cleanup costs were much greater.

In April of 1976, a witness reported to the IEPA that Petersen had not removed the approximately 500 barrels of paint and solvent waste that was in standing water or that posed a water pollution hazard. Instead he had buried the waste in a nearby berm. During an inspection by the IEPA, 10 to 15 uncovered barrels were found, and it was also discovered that Petersen had never installed a monitoring well. Various inspections took place during 1976, but they found the site to be in the same state as before. The Illinois Attorney General recommended that Petersen remove the drums to a landfill. In April of 1977, about 300 to 400 drums were removed and transported to Lakeland Landfill in Northbrook, Illinois for disposal. A September 21, 1977 court order against Petersen required him to install two groundwater monitoring wells. The wells were installed on November 14, 1977 (Planning Research Corporation 1988) and were called G101 and G102 (Figure 4). The IEPA sampled the monitoring wells and found elevated levels of boron, magnesium, mercury, sulfates, phenols, excessive solids, and PCBs. The Forest Preserve District also tested the sump pond that was between the gravel pit and the Des Plaines River (Figure 4). This area showed elevated levels of total dissolved solids and iron. In 1979, Petersen was given a National Pollution Discharge Elimination System permit from the IEPA to pump 1.3 million gallons of groundwater from the pit into the Des Plaines River. He was allowed to do this because parts of the pit were under water.
and gravel and illegal materials could not be removed unless the water level was lowered (Planning Research Corporation 1987).

In 1978, the LCFPD conducted a soil boring analysis of the landfill at the Petersen Sand & Gravel site because they were interested in buying the property and converting it into a recreational lake. They still found elevated levels of arsenic, chromium, lead, and mercury in the soil (Planning Research Corporation 1987). The LCFPD purchased the part of the site that contained the main gravel pit in 1979 (USEPA
When they purchased this land, Petersen signed a lease to operate the gravel pit until December of 1980 (Planning Research Corporation 1987).

Kenneth A. Fenner, Chief of the Water and Hazardous Material Enforcement Branch of the USEPA requested a survey of the site in May of 1980, and it was performed in June 1980. Water samples were taken from the pond discharge pipe and the G102 well, and a sediment sample was taken from the pond. The pond water sample was found to have iron and manganese that exceeded USEPA water quality criteria. The monitoring well had levels of chromium and lead that exceeded drinking water standards, and it also contained Aroclor 1254 (at 0.0029 ppm). The sediment sample contained arsenic at a level beyond an acceptable level, but this was probably a result of herbicides and insecticides that had been applied to nearby farmland. No exposed disposal material was found at this time (Planning Research Corporation 1988).

In 1980, Ecology and Environment Incorporated (E & E), consultants for the USEPA, conducted a metal detection survey at the site. This study took place to determine if there were any buried drums containing waste. E & E used a Fisher TW-5 metal detector to run scans in the fill area on the west side of the Petersen Pit, among other areas. If metal was found, the area was flagged and surrounding areas were checked to determine the lateral extent of the metal, and then excavated. No barrels were found, but E & E recommended that a groundwater monitoring program be established. Well G101 was no longer usable because it had gone dry, and a piece of construction equipment had gotten stuck in well G102. Therefore, well G103 was installed in 1981 and wells G104, G105, and G106 were installed in 1982 (Figure 5) (Planning Research Corporation 1987).
When Petersen’s mining lease expired at the end of 1980, the LCFPD had to come up with a plan of how to transform the site. They knew it would be difficult because almost all of the topsoil had been removed and there were vertical walls up to forty-five feet tall. The LCFPD searched for a mining reclamation expert to help them develop a plan for the site. They hired Tony Bauer from Lansing, Michigan to look at the potential for additional mining in order to gain revenue, investigate possible recreational and natural resource uses of the site, and develop a reclamation plan for the site (LCFPD
Soil borings revealed that significant deposits of sand and gravel remained in the pit; however, most of it would have to be wet mined and washed. This process is more expensive, but would probably be worthwhile because of nearby markets. Both a three- and nine-year plan were made for the reshaping of the vertical walls so that by the end of the new contract, the pit would be re-graded and seeded. Plans for some recreational activities such as swimming, fishing, and trails were developed, but only on a small amount of land that would be suitable for use. The plans were laid out for a bid in July of 1982, and the Lake County Grading Company was awarded the contract in October of 1982 (LCFPD 1992).

The contract that the Lake County Grading Company signed assured the LCFPD at least $97,000 a year even if no gravel was mined. In addition, $0.69 would be paid per ton of gravel. The LCFPD created a Gravel Pit Enterprise Fund to store the funds from the mining operation. These funds were only to be used for restoring the site. The minimum royalty was increased to $110,000 and $0.89 per ton in 1987. In November of 1991, the contract was extended until June of 1993 because there was not enough fill material to re-grade the steep slopes. The royalty was increased to $1.20 per ton until October 1992 when it was changed to $1.30 per ton. A $3.00 per truck tipping fee was also added for when earthen material was brought in to re-grade the site (LCFPD 1992).

In February of 1983, E & E performed a Preliminary Assessment (PA) at the Petersen Sand & Gravel site (Planning Research Corporation 1988). The PA found that PCBs, sludges (paint resin and waste paint), and solvent wash were present at the site. These substances were potentially hazardous because they could affect the environment and nearby human population by leaching into the groundwater or by running off or
leaching into the surface water. The PA determined that many potential hazards could result from the contamination at the Petersen Sand and Gravel site. These possibilities included groundwater discharges into the Des Plaines River, air contamination (because odor of old buried municipal refuse was released when digging an old area with a backhoe), potential drinking water contamination, potential exposure by the cleanup crew, flora in the area could be affected, fish in the Des Plaines River could also be affected, and the buried drums might leak. The people that could have been affected by this contamination included about twenty cleanup crew workers and approximately 15,000 nearby residents (Ecology and Environment, Inc. 1983).

The results of the PA warranted a site inspection (SI), which was performed by E & E on April 6, 1983 (Planning Research Corporation 1988). The SI had similar information as the PA, but it included more details. The population within three miles of the site (approximately 20,000 people) depended on groundwater for drinking. The nearest drinking water well was less than one mile from the contaminated site (Figure 6). The Des Plaines River and an on-site pond were the only surface water areas that could have been affected by the contamination. The nearest residential areas and buildings were about 0.1 miles from the site. Nearby sites included a few farming areas, a forested area, a boys’ camp, and a subdivision (IEPA 1983). The information from the SI was then used to compute an HRS score for the Petersen Sand & Gravel site. On June 1, 1983, the site received an HRS score of 44.16, and the majority of the score was based on the potential for groundwater contamination (USEPA 1988). Since the HRS score was higher than 28.5, the site was contaminated enough to be listed on the NPL; however, it was not listed at that time.
Approximate well locations (depth in feet) in the vicinity of the Petersen Sand & Gravel Site

Figure 6: Well Locations Near the Petersen Sand & Gravel Site
Source: Planning Research Corporation 1987
On July 29, 1983, a heavy equipment operator that worked for the Lake County Grading Company struck some buried drums about 100 feet east of the drums that had been found in 1977 (Planning Research Corporation 1987). About eleven barrels were found at this time, and many were broken or rusty (McCammon 1983c). It was discovered that they contained paint and paint solvent containing lead, cadmium, and barium. This caused concern because these toxins could have leaked into the surrounding soil and groundwater. This was particularly important because if a leak had occurred, it would spread toxins into wells in the surrounding communities of Green Oaks, Mettawa, and Libertyville (Libertyville Review 1983). The LCFPD contacted the USEPA, and the USEPA said they (the LCFPD) would be liable for cleanup under CERCLA (Schechner 2004). The LCFPD hired the Environmental Remedial Action (ENRAC) Department of Chemical Waste Management, Inc. (CWM) to investigate if there were additional buried drums (Planning Research Corporation 1987). They were hired on a $25,000 no-bid contract (McCammon 1983c).

ENRAC found seventy-five additional barrels in the northwest area of the pit on August 31, 1983, but they still believed that a few hundred more barrels might remain buried. For the time being, the seventy-five barrels were covered because they were emitting toxic gases into the air (McCammon 1983c). They used ground-penetrating radar and electromagnetic conductivity to conduct a survey of a five-acre area (Planning Research Corporation 1987). They also took about fifty soil samples from around the edge of the area, and down to a depth of twelve feet. This depth was chosen because it is around this depth that a layer of clay begins, and the contamination most likely did not penetrate through the clay layer. In addition, the water table was at about the twelve-foot
mark. CWM also monitored the water level in forty-two of these soil boring holes to
determine if there was any groundwater movement. The water level was the same in
each boring so the water was not moving, or it was doing so extremely slowly. Had it
been moving, the water would have had to be pumped out constantly while the barrels
were removed. F.T. “Mike” Graham, a LCFPD board member, was skeptical about the
fact that the water was not moving, but a more complete hydrologic study would have
cost between $50,000 and $100,000 and taken about four months to complete (Ludwig
1983). On September 1, 1983, between 200 and 300 additional barrels were detected by
radar (McCammon 1983c). Sixty-five were found to be above the water table, and as
many as 300 may have been located below the water table (McCammon 1983b).

On September 12, 1983, the executive director of the Lake County Health
Department, Dr. Steven Potsic, said that the toxic materials found at the site had to be
removed immediately. The barrels were found to contain heavy metals, and these metals
could “damage the central nervous system, sometimes causing convulsions, brain
damage, organ damage and even death” (McCammon 1983a, 7). The barrels at the
Petersen site were especially disconcerting because many were dented and appeared to be
leaking; therefore, it was recommended that they be moved as soon as possible
(McCammon 1983a). The site was supposedly not eligible for cleanup under Superfund
because “the pit is county owned and only serves the county” (McCammon 1983b, 1).

On September 19, 1983, the Libertyville Township Trustees passed a resolution
that urged the LCFPD and other agencies to clean up and remove the toxic waste as soon
as possible. They also wanted a daily inspection of all landfill sites, more monitoring
wells on these sites, and stiff penalties for landfill owners that put the community’s health
and safety in danger (*Libertyville Review* 1983). The cleanup was estimated to cost between $96,000 and $168,000, and could have possibly ended up being as much as $500,000 or more depending on if the water had been contaminated (Ludwig 1983). District officials realized that they had to pay for the cleanup, and then try to find the responsible parties later (*Daily Herald* 1983). Graham said that the barrels were “put there by a very angry man or a man who was in a hell of a hurry” (McCammon 1983b, 1). Even though there was no evidence, Graham thought the barrels may have been brought to the pit from the Great Lakes Naval Base in North Chicago (McCammon 1983c). Petersen said that he thought all of the waste had been hauled away in 1977, and he was not aware of the new barrels that had been found only about 100 yards from the original barrels (Myers 1983).

The LCFPD organized the excavation of about 500 barrels of solvent waste, 1000 paint cans, and 2621 cubic yards of contaminated soil. Many drums were crushed and deteriorating. Four overpacked drums were sent to Alabama and the rest were disposed of in a Calumet City, Illinois landfill. No additional refuse was found during further test excavations that were performed in several locations. ENRAC studied the extent of soil and groundwater contamination, but their results were inconclusive (Planning Research Corporation 1987). The LCFPD spent $230,000 on this cleanup (Vander Weele 1988).

Another HRS was performed on June 5, 1984, and the Petersen Sand & Gravel site obtained a score of 38.43. The score was high “because of lead concentrations in the soils and sump pond from samples collected in November 1983, as well as the potential for release of hazardous constituents to the groundwater” (Planning Research Corporation 1988, 12). The Petersen Sand & Gravel site was first proposed to be put on the NPL on
October 15, 1984, as part of the Federal Register’s second proposed update to the NPL (Planning Research Corporation 1988). The site was moved from the proposed NPL to the final NPL on June 10, 1986. In the interim a search for Potentially Responsible Parties (PRPs) ensued and was completed on April 19, 1985 (Cleanup Level Database 2004).

In 1985, the IEPA and USEPA signed an agreement to let the IEPA perform a Remedial Investigation/Feasibility Study (RI/FS) at the Petersen Sand & Gravel site. The Planning Research Corporation began the RI/FS work under contract with the USEPA (USEPA 1988). This investigation was conducted in order to determine the nature and extent of the site’s contamination. It also determined the level of risk to public health and the environment. The investigation included collecting ground and surface water samples, surface and subsurface soil samples, and sediment samples. The field activities for this study occurred between October of 1986 and December of 1987 (IEPA 1988). There was a delay in the study because Superfund had been experiencing financial problems; however, on October 17, 1986, President Reagan signed a $9 billion Superfund reauthorization bill. This allowed the USEPA to increase the number of sites they investigated, and the speed at which they were investigated. This bill let the USEPA go on with the investigation of 888 sites within the United States, and Petersen Sand & Gravel was one of these sites (Chandler 1986).

During the RI/FS process, groundwater samples were tested for over 150 compounds that are found on the Hazardous Substance List (HSL). Only a few contaminants were found at elevated levels in the groundwater. For samples that were representative of drinking water, iron and manganese levels exceeded Federal Secondary
Maximum Contaminant Levels (SMCL's) that were developed for taste and odor. Nevertheless, these levels were not considered a health threat, and they were also found in other groundwater test sites. Levels of nickel were also slightly elevated in some samples, but not to a level of unacceptable risk. Surface water samples did not show any signs of significant contamination. Surface soil tests indicated that inorganic materials including aluminum, beryllium, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, potassium, sodium, titanium, vanadium, and zinc exceeded background levels, but none were high enough to be of concern. Polycyclic aromatic hydrocarbons (PAHs), trichloroethane and toluene (organic compounds often found in solvents and oil), pesticides, and polychlorinated biphenyl (PCB) were found in low concentrations at various sample sites. Similar levels of these substances were found in the subsurface soil tests. All of the contaminants that were found were evaluated to determine the level of risk to public health and the environment (IEPA 1988). PRC evaluated eight different exposure scenarios:

- aquatic populations in the recreational lake coming into contact with or ingesting contaminated water
- future users of the lake ingesting contaminated aquatic life
- recreational users ingesting contaminated soil
- recreational users coming into direct contact with contaminated soil
- recreational users inhaling contaminated air
- site users ingesting contaminated groundwater
- present recreational users incidentally ingesting contaminated surface water other than the proposed lake
• present aquatic populations coming into direct contact with contaminated surface water other than the proposed lake (Planning Research Corporation 1988).

Overall, the endangerment assessment performed during the RI/FS found that there was very minimal risk to human and aquatic life, as well as to public health and the environment at the Petersen Sand & Gravel site. Previous removal actions were adequate; therefore, “No Further Action” was the preferred alternative at this site (IEPA 1988). The construction of a recreational lake probably would not pose any problems, but it was suggested that the surface water and sediments be continually monitored. The Forest Preserve District set up a plan in order to continue this monitoring. At the time of these tests, mining was still going on at the site. In order to let the mining continue, groundwater and precipitation that collected in the pit were discharged from the sump pond to the Des Plaines River. To ensure that contaminants were not released into the river, the discharge would be monitored under the IEPA’s National Pollution Discharge Elimination System (NPDES) permit program. The preferred alternative of “No Further Action” was officially accepted in the September 14, 1988, Record of Decision document (USEPA 1988). The Petersen Sand & Gravel site fell under the special category of “No Further Action” sites. These sites occur when “the final operable unit ROD determines no additional cleanup activities are required to achieve protectiveness of human health and the environment. It also includes sites with RODs requiring only monitoring or institutional controls” (USEPA 1989, 3).

Since no further action was required, the rest of the Superfund process advanced rather quickly. A Superfund Site Close Out Report was compiled for the Petersen Sand and Gravel site. It explained the background of the site, previous site activities, remedial
investigation results, ROD findings, community relations activities, and protectiveness. The community had been involved in the RI/FS process through public meetings, press releases, progress fact sheets, and creating and maintaining an information repository at the Cook Memorial Library. The “No Further Action” preferred alternative was presented in the June 1988 Proposed Plan. A public meeting was also held on June 21, 1988. The Site Close Out Report mentioned that the public’s response had been positive, and they would be kept involved throughout the deletion process. It also explained that the preferred alternative had been implemented, although nothing had to be done since the preferred alternative was “No Further Action.” A notice of intent to delete the Petersen Sand & Gravel site from the NPL was written, and the public comment period was established to be from September 29, 1989 until October 29, 1989 (IEPA 1989). The Petersen Sand & Gravel site was removed from the NPL on February 11, 1991 (USEPA 2004c). It may have taken so long because the removal assessment period went from May 31, 1988 until September 21, 1990. The deletion process also lasted from September 22, 1989 until February 11, 1991 when it was officially deleted (Cleanup Level Database 2004).

Site After Superfund

The removal of the Petersen Sand & Gravel site from the NPL was just the beginning of the overall process of creating what is now Independence Grove Forest Preserve. The LCFPD had not only gone through a lengthy Superfund process, but they also had been acquiring the land that would become Independence Grove Forest Preserve for almost thirty years. The LCFPD had a plan to obtain land along the Des Plaines River
which runs from north to south throughout Lake County. The District’s Board of Commissioners approved a resolution that designated about 400 acres of land along the Des Plaines River as part of this plan on April 12, 1973. These 400 acres consisted of the part of Libertyville Township north of Route 137. Later acquisitions brought the total to 756 acres along the river in this area. On October 16, 1975, the Board of Commissioners approved a resolution to designate 176 acres of land east of River Road between Guerin Road and Route 137 as LCFPD land. This acquisition was aided by $200,000 from the Libertyville Township. The LCFPD did not purchase all of the land that is now encompassed by Independence Grove. On July 8, 1975, Mr. David B. Armour donated 4 acres to the District that included a home. The home was later remodeled to become the LCFPD Headquarters. The Rehm family was granted a life estate as part of the purchase of their property at the northwest corner of River Road and Route 137. They are allowed to be the sole users of a small residence and an auto body shop until the death of the last principal owner. The auto body shop business is still in existence today. On May 11, 1992, the District acquired 20 more acres through a conservation easement of $200,000. This land is located just north of the former gravel pit along River Road. This arrangement means that this land will never be further developed beyond the single-family residence and family landscaping and nursery business that it currently contains. As of October 23, 1992, total expenditures for land acquisitions (excluding the Libertyville Township participation), was $8,052,991. During the early 1990s, eighty-one acres south of the Serbian Monastery were leased for cattle grazing and eighty-five acres were leased for agricultural purposes such as hayfields. This was done so the land would be kept open until plans for its restoration were put into place (LCFPD 1992).
The latest addition to Independence Grove was made on December 6, 2002. On this date the LCFPD purchased 14.5 acres of land for $2,200,000. This land was adjacent to the main Forest Preserve District offices and Independence Grove (LCFPD 2004b). It had once belonged to the Armour family, but in the 1980s they left it to Steve Pearson (their caretaker). When Pearson died in March of 2002, the land went up for sale and the LCFPD was the highest bidder (Musante 2002). It was an important acquisition because it added on to Independence Grove, and Bull Creek, a tributary of the Des Plaines River, was located there (LCFPD 2004b). The money for the purchase came from an $85 million loan that voters approved in 2000. Seventy million dollars had been designated for land acquisition and $15 million for development (Lissau 2002).

The Lake County Grading Company made an agreement with the LCFPD to mine out areas while keeping in mind the plans for it to become a recreational area in the future. They put in pumps to remove water that collected in the pit. The contract was extended for eight more years because more sand and gravel was discovered (LCFPD 1999). However, they agreed to give the LCFPD more proceeds and perform $6 million worth of earthworks to help shape the landscape into a usable and attractive form (Musante 2002). Mining continued at the site until 1996 (Kaiser 2000), and construction of the preserve actually began in 1997 (Musante 2002). The LCFPD had already drawn up plans for what they wanted the site to become so they were able to tell the Lake County Grading Company what they wanted them to do (LCFPD 1999). After all of the resources were mined from the quarry, construction equipment was used to crush the gravel and other rocks and remove them from the pit on conveyor belts. The LCFPD had the company bring in two million cubic yards of topsoil and clay to create about sixty
acres of land. This extra material helped transform the steep sides of the pit into a more natural, gently sloping shoreline. This made it safer for wildlife and helped to prevent erosion (LCFPD 2004a). They also created “underwater islands” that would serve as habitats for fish and plants. Weighted logs, concrete pipes, and fish cribs were also put into the bottom to also provide a good habitat for fish. Fish “caves” were also put into the sides of the pit, formed with concrete sewer pipe. In June of 1999, the water pumps were turned off so that water could accumulate to create the lake. Once the water had risen, the lake was stocked with fish such as muskie fingerlings, black crappie, largemouth bass, channel catfish, walleye, and yellow perch. Over 2500 trees were planted along the lake, and water plants such as arrowhead, water lilies, and buttercups were planted underwater and along the shoreline (LCFPD 1999). Thousands of shrubs, native prairie plants, and wildflowers were also planted at the site (LCFPD 2004a). A two-gallon bucket of water was also taken from a nearby pristine wetland and put into the lake in order to provide it with microscopic creatures such as amoebas and rotifers (LCFPD 1999).

F.T. “Mike” Graham, a LCFPD Board Member, did not want the Lake County Grading Company to continue mining even before their initial contract expired in 1991. In June of 1988, Graham expressed his concerns about how the Lake County Grading Company pumped 1.7 million gallons of water a day from a pond to the Des Plaines River. They did this to keep the mining pit dry, but Graham believed that it would diminish the well water supply (Vander Weele 1988). Graham stated “If they are pumping out 1.7 million gallons a day when there is no rain, they are drawing it all out of the aquifer...In my opinion, that is environmental disaster” (Vander Weele 1988, 3).
However, the IEPA explained that the rock that water was drawn from went dry a long time ago so no wells were drawing water from it at that time (Vander Weele 1988).

In October of 1992, the LCFPD Board appointed an eight-member Advisory Committee to develop a master plan for the site. This committee included municipal representatives, elected officials, and local residents. Their main goals were to determine what the site would be used for, how the site would be maintained, sources of revenue for the project, creating a master plan, and addressing public concerns such as traffic and flood control issues (Libertyville Site Master Plan Advisory Committee 1994a). Even before this committee was formed, the public was aware of the project, and had many concerns. The residents who lived to the east of the site were mainly concerned about an entrance to the park being near their neighborhood. A group of 150 local residents met on March 15, 1990, and formed CARRE (Citizens Against River Road Entrance). They came up with many reasons why they were against a River Road entrance into the park, including: increased traffic, greater wear and tear on the roads, the fact that it is a secondary road next to a residential area, there were no shoulders or sidewalks on the road, increased litter, and possible security problems. This group felt that it would be better to have the entrance on either Route 21 or 137 because they are primary roads, have scheduled county cleanups, and are regularly patrolled by police. This group was also concerned with more general aspects of creating the park. For example, some people thought that the pit could be used as a way to control Des Plaines River flooding. When the river flooded, the water could be held in the pit. Others thought that the park should be more of a nature preserve without so many commercial operations (Buss 1990). These issues, as well as additional ones would come up again in later meetings.
The first meeting of the Advisory Committee was held on September 11, 1992. It involved an introduction about the committee, a history of the site, a discussion of the planning process, an open discussion, and designation of future meeting times. The issues that came up during the open discussion were: funding for the project, program elements, other potentialities of the mining operation, and the need to look at other similar reclamation projects (Libertyville Site Master Plan Advisory Committee 1992a).

The second meeting was held on October 23, 1992. It was at this meeting that the extension of the Lake County Grading Company's contract was first discussed. The Lake County Grading Company thought that it would benefit the project by giving the LCFPD additional funds and free services that would aid in the construction of the park. About 1,500,000 cubic yards of material existed in the pit that could still be mined. The committee approved the contract extension. Presentations were also given about the environmental assessment of the site, as well as social and economic factors of the site.

A public meeting was scheduled for November 7, 1992. Tours of similar sites (Blackwell Forest Preserve in DuPage County Illinois and the Twin Lakes Recreation Area in Palatine, Illinois) were scheduled for November 16, 1992 (Libertyville Site Master Plan Advisory Committee 1992b).

The public meeting on November 7, 1992, attracted many community members who expressed a variety of concerns. These concerns included: the dust and noise problems for nearby residents, the fact that silt being pumped into the Des Plaines River was causing it to flood, when the mining contract would end, if the mining contractor was stripping all of the topsoil, if the LCFPD was making too much money, why some did not want a River Road entrance, and the prospect of phasing development in over a longer
period of time (Libertyville Site Master Plan Advisory Committee 1992c). Residents who lived to the east of the site had met on November 4, 1992, and they presented a formal letter expressing their concerns. They were most concerned with: not having an entrance off of River or Guerin Road, the heavy proposed uses of the park, the public suffering incurred if the park could not support itself financially, incorporating flood control into the project, and desire for many small parking areas instead of a few large ones. About 375 households made up this neighborhood, and in the past they had also circulated petitions that addressed these same issues (Jagula 1992). The Village of Green Oaks had also suggested that an entrance not be made off of River Road, or at least efforts be made to keep traffic on River Road to a minimum (Palmer 1990).

In January of 1993, the LCFPD Planning, Acquisition and Development Department developed three possible “themes” for the Libertyville site that would help the Advisory Committee when choosing and developing the park’s purpose and possible uses. No matter what, the site had to produce some revenue, the level of recreational activities would affect how the site was developed, and preservation and improvement of natural resources would be essential. Theme A involved more passive recreation with landscape restoration, trails, a small marina, areas for fishing, picnic shelters, spaces for educational programs, and open spaces for sports or other activities. Revenue could be obtained from renting boats and bikes, concessions, and special events. Theme B focused on the lake as a recreation center with many lake activities, golf course, trails, and other sporting activities. Revenue could come from a parking fee, horse livery, boat and bike rentals, and concessions. Finally, theme C would focus more on environmental education and recreation with an environmental education center, outdoor educational
opportunities, and a small marina. More funding would probably be needed for this type of project, but revenue could be gained from concessions; gift shop; and membership, parking, and rental fees (Fenelon 1993).

At the February 7, 1994 meeting, a presentation about having a family aquatic center was given by two employees from Leisure Concepts. Such a facility would have cost between $1.5 and $5 million, but it would probably produce an even greater amount of revenue. The Committee decided to plan for a natural beach area at the site, but to leave an area open for a possible aquatic facility in the future if the funds became available. A traffic impact study was also discussed at this meeting. The Committee decided to have the LCFPD and a traffic consultant look at the feasibility of using the existing entrance. In addition, the LCFPD came up with four different entrance alternatives, along with advantages, disadvantages, and costs of each one (Table 1) (Libertyville Site Master Plan Advisory Committee 1992c). They eventually chose the second alternative, most likely because it was the least expensive and there had been such opposition from residents regarding an entrance on or near River Road.

The Advisory Committee had met a total of ten times by the time they came up with a Master Plan in 1994. They had gone through four phases: Inventory and Data Collection, Data Analysis and Program Development, Conceptual Design, and Final Master Plan. The first phase included gathering environmental, social, and economic data. The second phase looked at the data from the first phase to determine how these aspects would be affected. Based on this information, uses for the site were determined. The Conceptual Design phase included coming up with three alternative plans, choosing a preferred alternative, and performing an economic feasibility study. The fourth phase
Table 1: Possible Entrances to the Park

<table>
<thead>
<tr>
<th>ALTERNATIVE</th>
<th>ADVANTAGES</th>
<th>DISADVANTAGES</th>
<th>COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: Off Rte. 120</td>
<td>* main road</td>
<td>* need engineering study to determine impacts</td>
<td>$1,125,000</td>
</tr>
<tr>
<td></td>
<td>* traffic would not affect existing neighborhoods</td>
<td>* need to build bridge over River</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>* safety problems</td>
<td></td>
</tr>
<tr>
<td>2: Rte. 137 near existing construction entrance</td>
<td>* main road</td>
<td>* safety problems</td>
<td>$90,000</td>
</tr>
<tr>
<td></td>
<td>* minimum impact to existing Neighborhoods</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3: Rte. 137; realign River Rd to meet East End Rd.</td>
<td>* potential for traffic signal</td>
<td>* potential impacts to east neighborhoods due to traffic</td>
<td>$160,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4: River Rd.; realign River Rd. to the west</td>
<td>* potential for traffic signal</td>
<td>* potential impacts to east neighborhoods due to traffic</td>
<td>$500,000</td>
</tr>
<tr>
<td></td>
<td>* would add 60 acres to Preserve</td>
<td>* cost of removing River Rd. and building new one</td>
<td></td>
</tr>
</tbody>
</table>

Source: Libertyville Site Master Plan Advisory Committee 1992c

involved making changes based on the third phase, and short and long-term implementation phases were set. The main elements of the Master Plan were: entrance off Buckley Road, recreation activity area in the southeast corner, public boat launch, trails, maintenance facility, Des Plaines River canoe launch and rental, shelters and family picnic area in the northwest corner, and general site landscaping and restoration. The total cost of the project was estimated to be between $8 and $8.5 million (Table 2). At that time, $2.8 million was available from mining royalties and $1.5 from a 1993 referendum. This left about $4 million that would need to be acquired in order to fund the project (Libertyville Site Master Plan Advisory Committee 1994a).

The Master Plan was presented to the public in October of 1994. Another public meeting was held on October 18, 1994. Members of the public gave both positive and negative feedback, but most of it was negative. Concerns included increased traffic, installation of traffic lights, wasting taxpayer money, linking trails to the Liberty
Prairie Reserve, not having an entrance on River Road, business uses of a public facility, too large a project, too many people would be brought in, and the site being too commercial (Libertyville Site Master Plan Advisory Committee 1994d). The Master Plan was adopted by the LCFPD in November of 1994 (Libertyville Site Master Plan Advisory Committee 1994a). At that time, it was hoped that the preserve would open sometime in 1997 or 1998 (Newton 1994).

Another task that had to be undertaken was deciding on a name for the preserve. Independence Grove, the name that was chosen, honors the history of the Libertyville area. The first Europeans to settle in what is now Libertyville were George Vardin and his family. They settled in the Cook Park area (now in the center of downtown) in 1834, and built a log cabin there. The area was named Vardin’s Grove, and more settlers began to come into the area. On July 4, 1836, the citizens decided to change the town’s name to Independence Grove. However, when they petitioned for a post office they found that this name was already taken. Archimedes Wynkoop suggested the name Libertyville, and the village was registered as Libertyville on April 16, 1837 (Duray 2000). Linda Ptak, a Highland Park resident, won a contest to name the park in 1998. She said, “Two

---

Table 2: Estimated Costs of Constructing the Park

<table>
<thead>
<tr>
<th>ITEM</th>
<th>ESTIMATED COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rte. 137 Entrance</td>
<td>$50,000</td>
</tr>
<tr>
<td>Recreation Core Area - Southeast Corner</td>
<td>$4,700,000-5,200,000</td>
</tr>
<tr>
<td>Private Boat Launch</td>
<td>$75,000</td>
</tr>
<tr>
<td>Trails</td>
<td>$500,000</td>
</tr>
<tr>
<td>Maintenance Facility</td>
<td>$400,000</td>
</tr>
<tr>
<td>Canoe Livery</td>
<td>$40,000</td>
</tr>
<tr>
<td>Shelter/Family Picnic Area</td>
<td>$640,000</td>
</tr>
<tr>
<td>General Landscaping and Restoration</td>
<td>$1,600,000</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$8,005,000-$8,505,000</strong></td>
</tr>
</tbody>
</table>

Source: Libertyville Site Master Plan Advisory Committee 1994b
years ago, when I entered the contest, I had a really good feel for what this represented. I thought that it represented freedom for me to do many things – and it does” (Jader 2000, 3).

Mining at the site stopped in 1996 (Kaiser 2000), and construction of the preserve began in 1997 (Van Sickle 2000). The park was set to open on July 4, 2000, but the LCFPD had problems with the builders they had hired (Kaiser 2000). Marian Professional of Chicago had been hired (Roszkowski 2000) for about $3 million to construct buildings for the park. The LCFPD had problems with this contractor and fired them, but then they had to find another company to finish the work (Orrick 2001a). This put the whole project behind schedule, and a delay in opening the preserve until at least the spring of 2001. Nevertheless, different contractors worked on landscaping, brick paving, lighting, and sewer line installation (Roszkowski 2000). Meridian Consulting was hired to finish the building projects at the site (Orrick 2001a).

The whole restoration of the Petersen Sand & Gravel site cost $38 million (Strzalka 2003), and $14.9 million of this total was spent exclusively on the construction of the park after the site had been removed from the NPL. Of this $14.9 million, $2.5 million came from a 1993 referendum, $6 million from a 1999 referendum, $1.55 million from state grants, and $4.85 million from gravel mining royalties. Some people were concerned about the amount of money spent on the project because similar ones had been done for much less money (Orrick 2001b). Steve Messerli, Executive Director of the LCFPD said, “It’s a large budget, but it’s also a large project. It’s probably the largest reclamation and restoration project in our history” (Orrick 2001a, 1). Costs easily compiled when $650,000 was spent on three steel truss bridges; $1.2 million on roads,
trails and storm sewers; $1.7 million on landscaping and signs total about $1.7 million; and $750,000 on architectural and engineering fees. In addition, the budget had been reduced by more than $1 million by scaling back a children’s play area. It was anticipated that future use of the preserve from weddings, meetings, and other events would produce a significant amount of revenue (Orrick 2001a). The LCFPD Director of Planning, Mike Fenelon, said, “This is different from anything we have in the county...Because it’s in an urban setting in the heart of Lake County, it made sense to put a lot of effort and money into it” (Kaiser 2000, 8).

An open house tour was given on Saturday October 7, 2000. Free boat rides, trail walks, entertainment, and refreshments were provided as part of the open house (Jader 2000). About 3000 people attended, and their responses were positive and they anticipated the opening of the park (Orrick 2001a). “This takes what was a damaged site and restores it to a very beautiful and useful purpose. The people of the area really deserve it. They have put up with a gravel mining operation for years and have been part of the process step-by-step,” said state Rep. Andrea Moore (Newton 1994, 1).

The first parts of Independence Grove Forest Preserve finally opened on April 14, 2001. The only thing that really opened at that time was two miles of trails. There was not yet parking at the site so visitors had to park elsewhere and follow the Des Plaines River Trail into the park (Orrick 2001a). The Visitor’s Center, cafe, and beach did not open until 2002 (Newton 2003). Independence Grove currently features a 115-acre lake for swimming, fishing, and boating, a 19,000-square-foot Visitor’s Center, amphitheater, fountain, native garden, picnic pavilions, sand volleyball courts, and many trails (Figure 7). The Visitor’s Center includes a classroom, gift shop, exhibits, and food services.
Figure 7: Independence Grove Forest Preserve
Source: LCFPD nd.
Many youth day camps and school field trips come to the preserve for various educational programs throughout the year (LCFPD 2004a). Weddings, summer camps, birthday parties, and business meetings also take place here (Newton 2003). A summer concert series began in 2003. During the 2004 season, about 15,000 people attended the nine concerts (Stearns 2004). In the winter, ice fishing and ice skating are also available at Independence Grove (Newton 2003). There is also a 30-acre dog exercise area off Milwaukee Avenue (LCFPD 2004a). Some restrictions were put in place to preserve the aesthetics and environment within the park. No horses, pets (except for in the dog exercise area), skateboards, or outside boats are allowed within the preserve. In addition, all fishing is catch-and-release so the fish population is not depleted (Orrick 2001b).

Independence Grove is one of only six LCFPD sites that is operated under the Revenue Facilities Division. "Events at Independence Grove" is the park's exclusive caterer, and they have a public-private partnership with the LCFPD. This company pays 75% of utilities and 90% of maintenance for the Visitor's Center, as well as 100% of their own administrative expenses. They also pay the LCFPD rental fees and a commission on food and beverage sales (Stearns 2004). Independence Grove tries to make money, but not in the traditional sense. It operates "according to a zero based budgeting system and is incorporated into the 'General Fund' of the Forest Preserve at the conclusion of a given Fiscal Year (July 1 – June 30)" (Stearns 2004, 3). Independence Grove's annual budget is approximately $1 million. In 2002, the park's profits only covered the operation costs, but in 2003-2004 it had a 15% profit margin, and a likely profit margin of 25% for 2004-2005. About 50% of profits come from recreation profits, and the other 50% comes from commissions and site rental income. Thirty
percent of the costs for the summer concert series are supported by sponsorships, and it is hoped that the entire cost of the series will be covered by sponsorships within two years (Stearns 2004). Revenue is also gained from a parking fee for non-Lake County residents. It costs $5 per car Monday-Thursday and $10 per car on Friday-Sunday and holidays (LCFPD 2004a). The swimming beach also charges $3 for county residents, and 30,000 people used it during 2002 (Newton 2003).

The history of the study site from its early days to becoming the Petersen Sand & Gravel Superfund site and finally to the Independence Grove Forest Preserve was a long and complex process. Nevertheless, the site was successfully removed from the Superfund NPL and transformed into a productive, popular park. The next chapter examines why it was able to experience such success under this program.
CHAPTER 4

RESULTS/DISCUSSION

The conversion of the Petersen Sand & Gravel site from a Superfund site to a park was a lengthy process that involved the cooperation of many agencies. This chapter analyzes the factors that led to the success of the conversion. Each objective is reflected upon and implications of the case study are addressed.

Measuring Success

My first objective was to explain why the Petersen Sand & Gravel site was considered a successful transformation. It can be deemed successful for many reasons beyond the fact that all of the toxic wastes were removed to an acceptable level for public use and the site was removed from the National Priorities List (NPL). One of the biggest reasons that this site was a success is because it is now a popular park. Today, Independence Grove Forest Preserve is considered the crowning achievement of the Forest Preserve District because it offers so many recreational and educational opportunities for residents of Lake County and other surrounding communities (LCFPD 2004a). The park has attracted thousands of visitors since it opened in 2001, and the numbers are anticipated to continue growing in the future (Table 3). The gates at Independence Grove recorded over 13,000 visits from June 1 to the middle of July in 2001 (Newton 2001). In a 2002 survey, Lake County residents reported that Independence Grove was the most visited Forest Preserve site with a remarkable 29 percent of respondents reporting that they had visited within the past two years (LCFPD
2002). This is impressive because Independence Grove did not even open until the spring of 2001. In addition, in the August 2002 issue of Chicago Magazine, Independence Grove was named “Best New Park” for its “exceptional rustic, natural setting and for its variety of outdoor recreation amenities including trail connections to the Des Plaines River Greenway” (LCFPD 2004c, 1).

Table 3: Independence Grove Visitors*

<table>
<thead>
<tr>
<th>YEAR</th>
<th>TOTAL VISITORS</th>
<th>% FROM OUTSIDE LAKE COUNTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>45,471</td>
<td>N/A</td>
</tr>
<tr>
<td>2002</td>
<td>104,709</td>
<td>2</td>
</tr>
<tr>
<td>2003</td>
<td>226,513</td>
<td>2.6</td>
</tr>
<tr>
<td>2004</td>
<td>200,800**</td>
<td>3</td>
</tr>
</tbody>
</table>

*only includes visitors recorded at the gatehouse that is open from mid-April to Memorial Day on weekends, daily from Memorial Day to Labor Day, and on weekends from Labor Day to mid-October; it does not include visitors who came in on foot or bicycle or those attending private events

**through September 4, 2004

Source: Stearns 2004

Table 4: Independence Grove Compared to State Parks within Lake County, IL

<table>
<thead>
<tr>
<th>SITE</th>
<th>REGION</th>
<th>ACRES</th>
<th>BOATING</th>
<th>FISHING</th>
<th>SWIMMING</th>
<th>TRAIL MILES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chain O'Lakes</td>
<td>Northwest</td>
<td>2793</td>
<td>X</td>
<td>X</td>
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<td>16.5</td>
</tr>
<tr>
<td>Illinois Beach</td>
<td>Northeast</td>
<td>4160</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>6.8</td>
</tr>
<tr>
<td>Independence Grove</td>
<td>Central</td>
<td>1114</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>7</td>
</tr>
<tr>
<td>Volo Bog</td>
<td>West</td>
<td>1148</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>3.25</td>
</tr>
</tbody>
</table>

Source: Illinois Department of Natural Resources 2003

One might wonder why Independence Grove has been such a success because there are many other nearby parks. There are eighteen public parks located within Libertyville alone (Village of Libertyville 1999), and three state parks located throughout Lake County. When compared to these state parks, it is somewhat apparent why Independence Grove is competitive with these parks (Table 4). Independence Grove is smaller than all of the state parks, but it offers similar lake-based recreational activities. In addition, despite its overall size, it has more miles of trails than two of the sites. One
of the biggest reasons why it is successful is perhaps its central location within the county (Figure 8). On average, most residents have to travel longer distances to get to the state parks located within Lake County than to get to Independence Grove. This is especially true for residents who live in the southern half of the county. The main entrance to Chain O'Lakes state park is not even inside Lake County, but just to the west in McHenry County. The part of the park that is within Lake County is located in the northwest corner. On the other hand, Illinois Beach State Park is located in the northeast corner of
the county along Lake Michigan. Volo Bog is located in the central western part of the county, but it does not have any lake-based recreation. The lake at Independence Grove "is the largest inland lake in the central-eastern part of the county with public access, which provides great fishing, boating, swimming, hiking, bird-watching, and picknicking opportunities" (LCFPD nd, 1). Most other lakes in this area are private or they do not offer many recreational opportunities.

Independence Grove can also be compared to other major Lake County Forest Preserve District (LCFPD) sites in order to explain its success (Figure 9) (Table 5). In the LCFPD’s 2002 survey of Lake County residents, Lakewood was the second most visited preserve (after Independence Grove), and Van Patten Woods was the seventh most visited (LCFPD 2002). Independence Grove offers more amenities than any of the other sites. Both Lakewood and Van Patten Woods offer the second most amenities. Even though it has the same number of amenities as Lakewood, Van Patten is not as popular perhaps because of its more northern location within the county. In addition, Lakewood offers many activities that are not as common at LCFPD sites, including a dog exercise area, museum, space for banquets or meetings, ice skating, and a sledding hill. The Fox River Preserve & Marina most likely was not included in this ranking because many of its current amenities were not available until 2002. Old School also did not make the list even though it has a significant number of amenities. This may be because the amenities available at Old School are common at many other preserves. Despite having the fewest amenities, Prairie Wolf was the third most popular preserve. This is probably because Prairie Wolf is the only park in that local area that has a dog exercise area, an amenity that is very popular among Lake County residents. Ryerson does not
Figure 9: Major Lake County Forest Preserve District Sites

*Site Abbreviations:
CM = Cuba Marsh
FR = Fox River Preserve & Marina
GB = Greenbelt & Cultural Center
GW = Grant Woods
HD = Half Day
IG = Independence Grove
LW = Lakewood & Lake County Discovery Museum
OS = Old School
PW = Prairie Wold
RW = Ryerson Woods & Visitors Center
VP = Van Patten Woods
WW = Wright Woods

Source: LCFPD 2004
Table 5: Major LCFPD Sites and Amenities (Ranked by Popularity*)

<table>
<thead>
<tr>
<th>MAJOR SITES**</th>
<th>IG</th>
<th>LW</th>
<th>PW</th>
<th>RW</th>
<th>WW</th>
<th>HD</th>
<th>VP</th>
<th>CM</th>
<th>GB</th>
<th>GW</th>
<th>FR*</th>
<th>OS**</th>
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<td>Acres</td>
<td>1114</td>
<td>2578</td>
<td>431</td>
<td>552</td>
<td>327</td>
<td>201</td>
<td>991</td>
<td>782</td>
<td>558</td>
<td>1118</td>
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<td>380</td>
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<td>Banquets/Meetings/ Weddings</td>
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<td>X</td>
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<tr>
<td>Camping: Youth Groups</td>
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<td>Nature Center/Native Gardens</td>
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<td>Bicycling (Miles)</td>
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<td>6</td>
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<td>Hiking (Miles)</td>
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<td>9</td>
<td>1.75</td>
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<td>5</td>
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<td>Horsetack Riding (Miles)</td>
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<td>1</td>
<td>4</td>
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<td>In-Line Skating (Miles)</td>
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<td>Self-Guided Nature (Miles)</td>
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<td>1</td>
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<td>Snowmobiling (Miles)</td>
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<td>3</td>
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<tr>
<td><strong>TOTAL AMENITIES</strong></td>
<td>22</td>
<td>20</td>
<td>6</td>
<td>9</td>
<td>12</td>
<td>13</td>
<td>20</td>
<td>7</td>
<td>14</td>
<td>10</td>
<td>13</td>
<td>17</td>
</tr>
</tbody>
</table>

*Source of Rankings: LCFPD 2002

**Site Abbreviations

IG = Independence Grove & Visitors Center

LW = Lakewood & Lake County Discovery Museum

PW = Prairie Wolf

RW = Ryerson Woods & Visitors Center

WW = Wright Woods

HD = Half Day

VP = Van Patten Woods

Source: LCFPD 2004d
have a large number of amenities because it focuses more on passive recreation. Nevertheless, its quiet atmosphere, scenic hiking opportunities, and many educational programs most likely attract visitors. The rest of the sites’ popularity seem to follow along with the number of amenities that they offer. Independence Grove was probably the most visited preserve because it offers the most amenities, it is the only site that offers swimming, and one of only a few sites with boat rentals, a canoe launch, dog exercise area, ice skating, native gardens, and in-line skating trails. Many of these activities are very popular with county residents. Independence Grove also may be especially appealing because it offers these less common activities as well as many others. The combination of these activities and a central location contribute to Independence Grove’s success among Lake County residents.

The success of Independence Grove can also be measured by its competition with other local parks and beaches that are not a part of the LCFPD. One example is Lake Minear, a 72-acre spring-fed lake that is located just west of the Des Plaines River in northern Libertyville (Figure 8). Since 1957, Lake Minear has been an area for swimming, fishing, and boating, as well as having a playground and picnic area (Zawislak 2003). However, only residents who live on the lake and other paying members are able to utilize these resources. All 1,250 memberships were sold out during the 2001 season (Ahern 2004). In 2002, 300 fewer memberships were sold. In 2003, memberships cost $120 for families and $90 for individual adults. Swimming lessons were also offered for $100 for each two-week session, and two different sessions were offered. Extended fishing rights were also available for $55 in 2003. Membership dues are the primary source of income for the club and the money is used to make
improvements each year (Zawislak 2003). In 2004, memberships were $130 for families, $95 for individual adults, and $65 for senior citizens. The option for reduced senior citizen rates was offered to appeal to senior citizens’ needs, and to try and get more members. The 2004 season had been a struggle with only 630 members so in order to entice members, current members handed out fliers at local stores, decorated a parade float, offered a pay-as-you go membership, and hosted a luau fundraiser (Ahern 2004). The luau fundraiser was a success, and Lake Minear beach will be open during the summer of 2005, but if there is not enough financial support it may only be a matter of time before it closes.

One reason why Lake Minear did not have enough members was because of competition. The Independence Grove beach, an improved Adler Park Pool, and new aquatic facilities in Vernon Hills and Grayslake drew people away from Lake Minear (Roszkowski 2004). Competition as a whole has been a problem, but “membership really started to decline as soon as Independence Grove opened” (Ahern 2004, 3). This was probably due to Lake Minear’s close proximity to Independence Grove, and the fact that Independence Grove is a public beach that only charges per each use of the beach. Each use of the Independence Grove beach costs $3 for Lake County residents and $6 for people from outside the county. A 20-visit Beach Admission Card can also be purchased for $48 for residents and $96 for non-residents (LCFPD 2004a). The other nearby pools are also public facilities that charge for each use or users can buy a season pass. The fact that people have to pay to merely enter Lake Minear might be a factor because there are many activities available at Independence Grove for free. These free activities include hiking, biking, and summer concerts. Lake County residents can also park at
Independence Grove for free, but non-residents have to pay $5 per car from Monday-Thursday and $10 per car Friday-Sunday. Fees are also charged for rental of boats, bikes, and picnic shelters. Therefore, the success of Independence Grove is partly because the wide variety of activities that are offered, and the fact that many of them are free.

Kevin Asher, a park planner, said, “The power of a park is not in its size...The true standard of a park is the level of customer satisfaction” (Krohe 1990, 10). Independence Grove would definitely be considered a success based on this statement. Despite residents’ initial concerns, the public’s responses were very positive once the site finally opened on June 2, 2001 (Ryan 2001). Dan McGowan, a Gurnee resident, said, “I’ve been keeping an eye on the place while the county’s been working on it, but I didn’t have any idea of how beautiful it would be” (Ryan 2001, 1). Andy Kimmel, director of environmental education for the LCFPD, said, “It [Independence Grove] has many different things people can do all in one location and I think that’s what makes it so popular. It’s also centrally located in the county so it’s really easy to get to” (Roszkowski 2003, 3). Various editorial pieces in local newspapers also expressed deep satisfaction with the park. One letter to the editor stated:

There is a new treasure in Lake County. The treasure is called ‘Independence Grove.’ What was once a hard-working gravel pit, now is a little bit of heaven. The landscape architecture is amazing. The lakes, the trails, the prairie garden and the Millennium Plaza are a perfect backdrop for countless special occasions. Picture an open-air theater in the round, concerts and art shows. The staff and board of the Lake County Forest Preserve deserve our applause and compliments. I know it took a long time (actually, it still is not completely finished), but by my count, it’s worth it. Check it out! (Pyter 2001, 17)

An editorial piece by Tim Froehlig (2001, 3) described his experience at Independence Grove. He wrote:
As I approached the Des Plaines River canoe launch area, I felt a feeling I believe would be similar to the feeling early settlers got the first time they saw the river. The vegetation throughout the park is not only lush, but much of it seems like it has never been touched by human hands before. I felt like I was transported back in time, to a place where there was no traffic, pollution, noise or otherwise. I remember thinking one thing that morning: I wish there were more places like this around here. It's very refreshing to know that some of our money is being spent in a way that is worthwhile.

These testimonials demonstrate that visitors were very impressed with Independence Grove; therefore, the restoration of this project is successful.

The transformation of the Petersen Sand & Gravel Site into Independence Grove Forest Preserve can also be considered a success on another level. The fact that many different agencies were able to form partnerships and work together toward a common goal was a success in and of itself. The LCFPD had a vision to create a park at the site, and they did not stop until their goal had been accomplished. The citizens of Lake County also contributed to the project's success. The citizens approved two referendums that allocated funds for the construction of Independence Grove. The mining royalties that the LCFPD obtained from their partnership with the Lake County Grading Company were also a crucial source of funding. The public accepted the fact that the mining contract would be extended, and the construction of the park delayed. The Libertyville Site Master Plan Advisory Committee did a good job of keeping the public informed, as well as taking concerned citizens' ideas into account. The LCFPD enhanced Independence Grove by purchasing additional property around the site. Overall, many different agencies worked together along with Lake County citizens to make Independence Grove the best it could be; therefore, the whole process can be considered a success.
Aids to the Superfund Process

My second objective was to study how the restoration of the Petersen Sand & Gravel site was completed and to determine what other forces and agents may have aided its restoration. The restoration of the site took over twenty years to complete, and many factors contributed to its success. One of the main reasons was that previous cleanup methods had been sufficient. The first cleanup was completed in 1977, but not under the Superfund program because it did not yet exist. The second major cleanup occurred in 1983 when the LCFPD board members were told that they were responsible for the cleanup of the site, and that it could not be listed on the NPL. These earlier cleanups led to the preferred alternative of “No Further Action” when the Petersen Sand & Gravel site was finally investigated under the Superfund program. However, significant amounts of time and money went into investigating the site under the Superfund program so the fact that it went through the program is also impressive when so many other projects are still going through the process. Another reason for its successful cleanup was that the LCFPD had purchased the land and had a vision for the future use of the site. Advanced planning seems to be of critical importance for a Superfund site to be successfully transformed. The Petersen Sand & Gravel site was similar to the Wichita, Kansas case (Meyer et al. 1995) because, in both cases, the plan seemed to push along the cleanup process. Therefore, Choi’s (2004) idea of “futuristic” restoration was important for Independence Grove because it aided in the site’s cleanup. Almost all of the cleanup processes that took place at the Petersen Sand & Gravel site kept sight of the fact that the area would be used as a park in the future. A third reason why the Petersen Sand & Gravel site was a Superfund success story was because of the partnerships that were made between the
LCFPD, Illinois Environmental Protection Agency (IEPA), and USEPA. If the LCFPD had not been involved with the site, it may have never been restored to a productive use. The LCFPD also had a partnership with the Lake County Grading Company after the site was removed from the NPL. This partnership also aided the transformation of the site into a park because the Lake County Grading Company performed earthworks to help shape the landscape so it could be used for recreational activities. In addition, the LCFPD was able to gain revenue from the mining profits. Therefore, the fact that previous cleanup methods had been sufficient, the LCFPD owned the land and had a vision for its future use, and they developed partnerships with other organizations all assisted in the successful restoration of the Petersen Sand & Gravel site under the Superfund program.

Economics

My third objective was to examine the economics of the restoration process, to determine if sources of money were acquired from outside of the Superfund program, and if so how these external funds impacted the success of the process. Financial resources for the cleanup of the Petersen Sand & Gravel site came from many different sources. While the Petersen Sand & Gravel site investigation cost the USEPA a great deal of money, a lot more could have been spent. The LCFPD and Raymond Petersen had already put money into the cleanup of the site before the USEPA even became involved. It helped that one person (Petersen) was responsible for the site’s contamination. The LCFPD was also able to recoup the $224,483 they had spent on the cleanup from Petersen. In 1983, Petersen wrote off the full cost of the cleanup from the price of a 25-
acre land parcel that he sold to the LCFPD. The LCFPD ended up paying $165,500 for this piece of land that had an appraised value of $390,000. Therefore, the LCFPD was able to regain the money they had spent on the cleanup of the Petersen Sand & Gravel site, and it allowed them to buy a strategically located piece of property. The parcel of land they purchased in this transaction was west of the Des Plaines River, at the corner of Routes 137 and 21 (Peterson 1983). The USEPA was also able to benefit from the fact that only one person was responsible for contamination at the Petersen site. In 1991, the USEPA sued Petersen Sand & Gravel for $800,000 in the United States v. Petersen Sand & Gravel, Inc. case. The USEPA wanted to get back the money they had spent on the investigation at the site (Schechner 2004). They also wanted Petersen to be fined for not responding to their information requests. In 1993, the case was finally settled and Petersen was ordered to pay the USEPA $700,000 with $590,000 for investigation costs and an additional charge of $110,000 for not responding to their information requests (Spencer 1993).

The fact that one person could be held responsible for the contamination was another reason for the Petersen Sand & Gravel site’s success under the Superfund program because it aided the economics of the project. In addition, the LCFPD funded a great deal of the restoration project after the site was removed from the NPL. They were able to obtain money from a variety of sources, including referendums, grants, and gravel mining royalties from the Lake County Grading Company. The fact that the USEPA was not the sole source of financial support for the Petersen Sand & Gravel site’s restoration seemed to be a major factor in its successful transformation.
What Can Be Learned

My final objective was to determine what can be learned and possible implications of the successful transformation of the Petersen Sand & Gravel site into Independence Grove Forest Preserve. The easiest way to examine what can be learned from the success of the Petersen Sand & Gravel site under the Superfund program is to compare it to other Superfund sites that have also been successfully restored to a productive use (Table 6). This can also help one see any trends of success. The major reasons why the Petersen Sand & Gravel site was successfully transformed were that it was a “No Further Action” site, there had been a plan in place for its future use, one person was responsible for the contamination, and many different partnerships were created throughout the restoration process. The fact that the Petersen Sand & Gravel site was a “No Further Action” site is unique and none of the other successful sites had this as their preferred alternative. It was a “No Further Action” site because the cleanup measures that were taken before the site was placed on the NPL were enough to make the site safe for public use. Only Chisman Creek and the Petersen Sand & Gravel site had the luxury of only one person being responsible for the site’s contamination. On the other hand, all of the sites had a plan for reuse and developed partnerships during the Superfund process; therefore, these are two keys for a successful Superfund site transformation. The USEPA already seems to be aware that these factors are important as, in 1999, the Superfund Redevelopment Initiative (SRI) was created to help the USEPA work with communities to determine likely future uses of the site before a cleanup method is selected and applied. This is helpful because then the cleanup method can be made appropriate for the future use of the site. This program has helped
Table 6: Petersen Sand & Gravel Site Compared to Other Superfund Successes

<table>
<thead>
<tr>
<th>Site</th>
<th>Location</th>
<th>No Further Action Site</th>
<th>Plan for Reuse</th>
<th>One Person Responsible</th>
<th>Partnerships</th>
</tr>
</thead>
<tbody>
<tr>
<td>Army Creek Landfill**</td>
<td>New Castle, DE</td>
<td>No</td>
<td>Yes</td>
<td>Maybe</td>
<td>Yes</td>
</tr>
<tr>
<td>Chisman Creek**</td>
<td>Seaford, VA</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>DuPage County Landfill*</td>
<td>Warrenville, IL</td>
<td>No</td>
<td>Yes</td>
<td>Maybe</td>
<td>Yes</td>
</tr>
<tr>
<td>East Anaconda Smelter**</td>
<td>Anaconda, MT</td>
<td>No</td>
<td>Yes</td>
<td>Maybe</td>
<td>Yes</td>
</tr>
<tr>
<td>Petersen Sand &amp; Gravel*</td>
<td>Libertyville, IL</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Sources: USEPA 2004c, USEPA 2004d, USEPA 2004e, USEPA 2005a

communities view Superfund sites as more valuable and more viable for future use. The USEPA also took this opportunity to review its policies to look for areas where changes could be made to promote site reuse. Since partnerships between the USEPA and other agencies have contributed to the successful reuse of many sites, this will continue to the same or an even greater degree.

Another part of the SRI program was to publicize information about successful site reuses and analyze the positive economic, environmental, and social impacts of reuse. This latest phase of the SRI, the “Return to Use” initiative (RTU), was announced on November 10, 2004. This initiative deals with sites where cleanups have already been implemented, and the site is now considered construction-complete. Many of these sites are clean and safe, but are not being used productively. The RTU initiative examines the cleanup remedies to see if they can be altered in order to encourage reuse of the site. This is important because many of these construction-complete sites are susceptible to vandalism and trespassing. Reusing the site can prevent negative activities such as these, and also have positive economic and social impacts on the community. So far this program has been very successful; therefore, it should contribute to the successful reuse of Superfund sites in the future (USEPA 2005b). Thus, having a plan for a site’s future use and developing partnerships are two keys to a successful Superfund site.
transformation, with having one person responsible for the contamination, cleanup activities being performed before the site is put on the NPL, a variety of financial resources, good public communication, and being a “No Further Action” site as secondary aids for success.
CHAPTER FIVE

CONCLUSION

Independence Grove is now a popular park, and it benefited from its central location within Lake County. Knowing the history of the site was important because it offered insight into why it was able to be successfully restored. Had someone just looked at the site as it is now, one may have come up with very different conclusions. The factors that led to its success are briefly discussed in this chapter.

The fact that the Petersen Sand & Gravel site was a "No Further Action" site is unique because most Superfund sites require some type of remedial action after they are placed on the National Priorities List (NPL). The Petersen Sand & Gravel site was a "No Further Action" site because both Petersen and the LCFPD had already undertaken cleanup measures before the site was placed on the NPL. These previous cleanups had removed enough of the contaminants so that the site was safe for public use. This unique aspect of the Petersen Sand & Gravel site definitely aided its transformation into Independence Grove Forest Preserve, but it was only one of many factors that contributed to its success.

The LCFPD's involvement with the Petersen Sand & Gravel site was instrumental to its successful transformation. The LCFPD had a vision of transforming the site into a park, complete with a 115-acre lake. Their involvement not only provided the project with financial resources, but also led to cleanup efforts before the site was placed on the NPL. The LCFPD's vision was also important at other times during the restoration process. For instance, when the Lake County Grading Company was hired to continue
mining the site, some of the financial resources gained from their operation were used to finance the site’s transformation into Independence Grove Forest Preserve. In addition, the Lake County Grading Company was able to complete earthworks that aided in the site’s conversion. Therefore, the LCFPD’s plan to reuse the Petersen Sand & Gravel site by transforming it into a park played a significant role in its success.

Partnerships such as the one between the LCFPD and the Lake County Grading Company were also essential to the Petersen Sand & Gravel site’s successful transformation. This partnership benefited both parties because they were both able to gain revenue while beginning to convert the site at the same time. The LCFPD also formed partnerships with the IEPA and USEPA. Both of these agencies assisted the LCFPD with the transformation of the Petersen Sand & Gravel site by providing financial resources and conducting an assortment of site surveys. Without these partnerships, the Petersen Sand & Gravel may have never been transformed into Independence Grove Forest Preserve.

The fact that one person, Raymond A. Petersen, was responsible for the Petersen Sand & Gravel site’s contamination also contributed to its successful transformation. Since Petersen was responsible for the contamination, he was fined and ordered to remove some of the contaminated materials even before the site was listed on the NPL. In addition, both the LCFPD and the USEPA were able to recover the funds that they had spent on the site’s cleanup from Petersen. Authorities also knew a great deal about the site since Petersen had been the only principal owner of the property since mining had begun in the early 1950s. For example, it was known that Petersen mined the site, but also that he had used it as a landfill. This gave authorities an idea of what kind of
contamination was present, and how the toxins may have posed problems for nearby residents. The fact that Petersen was the principal person responsible for the Petersen Sand & Gravel site's contamination led to more being known about the site's contamination and different agencies being able to obtain money from Petersen for their cleanup efforts, thus aiding the site's successful transformation.

Many sources of financial support also contributed to the Petersen Sand & Gravel site's successful transformation. The IEPA, USEPA, LCFPD, and Raymond A. Petersen each financed various portions of the project. The key financial resources were the ones that the LCFPD were able to obtain through two different county referendums, state grants, and gravel mining royalties from the Lake County Grading Company. The citizens of Lake County approved two referendums which showed that they supported the LCFPD's work. Without all of these different sources of financial support, the LCFPD may not have been able to construct Independence Grove Forest Preserve; therefore, these other sources of financial support assisted in the Petersen Sand and Gravel site's successful transformation.

The successful transformation of the Petersen Sand and Gravel site into Independence Grove Forest Preserve can also be contributed to the LCFPD keeping the public informed of the project, followed by the public's support for the project. The public was asked for their opinions about the project many times, most notably during the Libertyville Site Master Plan Advisory Committee's public meetings. The LCFPD listened to the public's concerns, and took them into consideration when planning the construction of Independence Grove Forest Preserve. For example, many citizens did not want Independence Grove to have an entrance off River Road, and the LCFPD came up
with a solution that avoided this concern. The public was also kept well informed through many newspaper articles about the project and an information repository at Cook Memorial Public Library. In addition, open house tours of the site were offered before it opened. Over time, public support of the project grew, and many citizens greatly anticipated the opening of Independence Grove. When it finally opened, the public visited in great numbers, and were very pleased with the results. Therefore, having good communication with the public, and the public's ensuing support also contributed to the successful transformation of the Petersen Sand & Gravel site.

Examining the success of the Petersen Sand & Gravel site is important because it shows that sites can be successfully restored to a productive use under the Superfund program. If all of the above variables are met, a Superfund site should be able to be successfully transformed into a productive use. The more that are met, the more successful the project should be. Due to local circumstances, following this plan may not work in all cases; however, evidence suggests that these are the most important factors for restoring any Superfund site. In fact, any project should be successful if a vision or plan exists at the beginning, partnerships are formed, many sources of financial support are available, and the public is well informed and supports the project.
Appendix

Timeline of Major Events in the History of the Petersen Sand & Gravel Site
<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
<th>Event</th>
<th>Date</th>
<th>Event</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petersen purchased the property</td>
<td>1952</td>
<td>Petersen began to allow dumping</td>
<td>1955</td>
<td>Lake County Health Department became aware of refuse in pit</td>
<td>December 1968</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Health Department told Petersen he needed permit to continue landfilling</td>
<td></td>
<td></td>
<td>1969</td>
</tr>
<tr>
<td>Petersen applied for and is denied a landfill permit</td>
<td>1971</td>
<td>Illinois Pollution Control Board ordered that no more refuse be accepted, existing refuse covered, and that Petersen be fined</td>
<td>June 1972</td>
<td>Witness reported seeing 500 barrels at site</td>
<td>April 1976</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>300-400 barrels transported to landfill</td>
<td>April 1977</td>
</tr>
<tr>
<td>Court order required Petersen to install two groundwater monitoring wells</td>
<td>September 21, 1977</td>
<td>Wells G101 and G102 installed</td>
<td>November 14, 1977</td>
<td>Lake County Forest Preserve District (LCFPD) conducted soil boring analysis</td>
<td>1978</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>LCFPD purchased property</td>
<td>1979</td>
</tr>
<tr>
<td>USEPA examined site</td>
<td>June 1980</td>
<td>Ecology and Environment, Inc. examined site</td>
<td>1980</td>
<td>Petersen's mining lease expired</td>
<td>1980</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lake County Grading Company awarded new mining contract</td>
<td>October 1982</td>
</tr>
<tr>
<td>Event</td>
<td>Date</td>
<td></td>
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<td>----------------------------------------------------------------------</td>
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<tr>
<td>Preliminary Assessment performed</td>
<td>February 1983</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Site Inspection performed</td>
<td>April 6, 1983</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Site received a Hazard Ranking System score of 44.16</td>
<td>June 1, 1983</td>
<td></td>
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<tr>
<td>Heavy equipment operator struck drums, 11 drums found</td>
<td>July 29, 1983</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>75 additional drums found</td>
<td>August 31, 1983</td>
<td></td>
<td></td>
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<tr>
<td>200-300 barrels found with radar</td>
<td>September 1, 1983</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Barrels, paint cans, and contaminated soil removed</td>
<td>1983</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Site received a Hazard Ranking System score of 38.43</td>
<td>June 5, 1984</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Site proposed to be put on National Priorities List (NPL)</td>
<td>October 15, 1984</td>
<td></td>
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<tr>
<td>Search for Potentially Responsible Parties (PRPs) completed</td>
<td>April 19, 1985</td>
<td></td>
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</tr>
<tr>
<td>Site moved to final NPL</td>
<td>June 10, 1986</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>President Reagan signed Superfund reauthorization bill</td>
<td>October 17, 1986</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remedial Investigation/Feasibility Study performed</td>
<td>October 1986 – December 1987</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>“No Further Action” presented as preferred alternative</td>
<td>June 1988</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>“No Further Action” accepted as preferred alternative</td>
<td>September 14, 1988</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Event</td>
<td>Date/Period</td>
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<td>-----------------------------------------</td>
<td>--------------------------------------------------</td>
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<tr>
<td>Public comment period</td>
<td>September 29, 1989 – October 29, 1989</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Site removed from NPL</td>
<td>February 11, 1991</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Libertyville Site Master Plan</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Advisory Committee created</td>
<td>October 1992</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Master Plan presented</td>
<td>November 1994</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Mining ended at site</td>
<td>1996</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction of Independence Grove (IG) began</td>
<td>1997</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First parts of IG open to public</td>
<td>April 14, 2001</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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