Illinois
Environmental
Protection Agency

Bureau of Land
1021 North Grand Avenue East
Springfield, Illinois 62794

March 1999

Leaking Underground Storage Tank Program

1998 Annual Report

Printed on Recycled Paper

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List of Acronyms

BOL	Bureau of Land
EPA	Environmental Protection Agency
HP	High Priority
IAC	Illinois Administrative Code
IEMA	Illinois Emergency Management Agency
IPCB	Illinois Pollution Control Board
LP	Low Priority
LUST	Leaking Underground Storage Tank
NFA	No Further Action
NFR	No Further Remediation
OSFM	Office of the State Fire Marshal
PPA	Performance Partnership Agreement
TACO	Tiered Approach to Corrective Action Objectives
U.S. EPA	United States Environmental Protection Agency
UST	Underground Storage Tank

Introduction

Welcome!

It is with great pleasure that the Leaking Underground Storage Tank (LUST) Section presents its 1998 Annual Report. As in years past, the report describes the origin and administration of the LUST program in Illinois and highlights our achievements from the previous calendar year. Whether you are new to the LUST program or long familiar with the regulations, you will find information to enhance your understanding of LUST cleanups.

In 1998, the LUST Section hit a five-year peak in reported tank releases, attributed to the tank upgrade deadline administered by the U.S. Environmental Protection Agency and the Office of the State Fire Marshal. Thanks to innovative uses of the Tiered Approach to Corrective Action Objectives (TACO), and a new methodology for site classification, we boosted the number of No Further Remediation letters issued to tank owners and operators by 10 percent from 1997 to 1998. The LUST Section continues to support the cleanup of brownfields sites; in fact, the first municipal brownfields redevelopment grant issued by the Illinois EPA will be spent assessing three abandoned gas stations in the City of Lockport.

We are expanding our outreach by increasing our use of the Internet. For the first time last year we modified our publications for use on the world wide web. We intend to adapt the contents of this report for the Internet too and encourage you to visit our home page at: www.epa.state.il.us/land/underground-storage-tanks/index.html

We invite your comments and suggestions for improvement. Please contact Heather Nifong, Illinois EPA, 1021 North Grand Avenue East, Springfield, IL 62794-9276, 217-785-4729, or at epa8125@epa.state.il.us

Sincerely,

Douglas W. Clay, P.E., Manager
Leaking Underground Storage Tank Section

Relationship to the U.S. EPA

A Cooperative Agreement formalizes the relationship between the LUST Section and the United States Environmental Protection Agency (U.S. EPA), providing a monetary grant from the U.S. EPA to the Illinois EPA to conduct LUST activities. The LUST Section's commitments to U.S. EPA are outlined in a Performance Partnership Agreement (PPA). The PPA sets forth the mutual agenda for continued environmental progress and the expectations of the relationship between the Illinois EPA and the U.S. EPA.

The PPA includes environmental goals and environmental objectives applicable to the land quality in Illinois, which represent future environmental targets. Environmental indicators in the PPA measure the progress toward meeting the environmental objectives. For example, one environmental objective is to reduce or control risks to human health and the environment from contaminated sites. The LUST Section indicates its success in meeting this objective by reporting the number of acres of land where health risk is reduced to safe levels (see Figure 1). Organization of the goals, objectives, and indicators in this way helps to ensure mutual commitment to cost-effective environmental improvement.

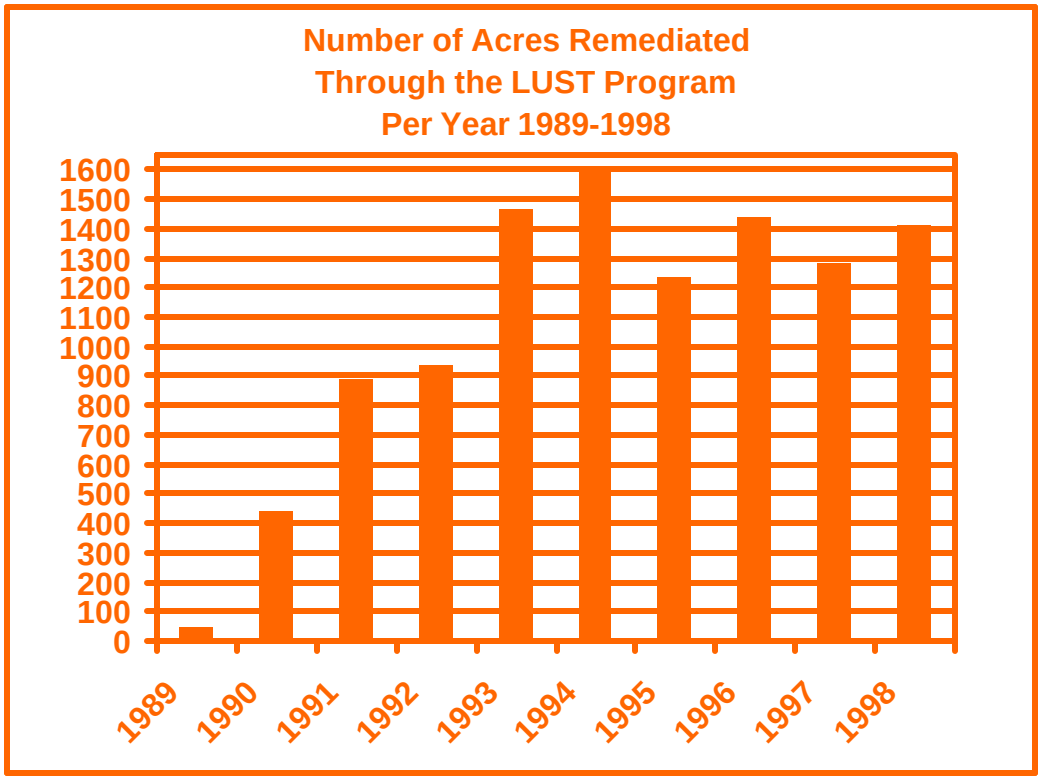

Figure 1

While the LUST Section issued No Further Remediation (NFR) letters to more sites in 1998 than 1997 (thereby resulting in more acres remediated), after some research, the LUST Section determined that the average LUST site is approximately 1.75 acres rather than 0.5 acres per site previously used to estimate the total acres remediated for each year. (Note: All previous years of LUST data have been adjusted as well to reflect the change in average acreage per site.)

Underground Storage Tank (UST) Program

The Illinois EPA administers the remedial investigation and corrective action portion of the state program and the state UST Fund reimbursements, while the OSFM administers the preventative side of the program.

Illinois has entered into a cooperative agreement with U.S. EPA in which the Illinois EPA and the Illinois Office of the State Fire Marshal (OSFM) administer a comprehensive underground storage tank program at the state level. The Illinois EPA administers the remedial investigation and corrective action portion of the state program and the state UST Fund reimbursements, while the OSFM administers the preventative side of the program. The Illinois EPA LUST Section staff review the technical adequacy of site classification plans and reports, groundwater monitoring plans and reports, corrective action plans and reports, and associated budgets. This includes the development of the appropriate remediation objectives for each site. Once the site has met its remediation objectives and program requirements, the Illinois EPA issues a ANo Further Remediation@ letter for the LUST incident. LUST staff also perform site visits as needed. In addition, Illinois EPA staff review and process claims for reimbursement from the UST Fund for corrective action costs.

In most cases, the OSFM is already involved with a site when a release is reported to the IEMA. The OSFM regulates daily operation and maintenance of UST systems, including oversight for tank removals. The OSFM may provide helpful information to the LUST Section when questions arise concerning suspected releases, potential threats to human health and the environment, and site conditions upon tank removal.

Federal rules required owners and operators of existing tanks (installed before December 22, 1988) to have spill protection, overfill protection, and corrosion protection by December 22, 1998. Tank owners and operators could either choose to add spill, overfill, and corrosion protection or to properly remove, abandon, or replace the existing UST by December 22, 1998. The OSFM administers the UST upgrade requirements in Illinois, where approximately 47,000 known existing tanks are subject to the regulations. Of the more than 12,500 UST facilities in Illinois, OSFM issued approximately 7,500 Agreen tags@ by the deadline date, which indicates to product deliverers that the UST is in compliance and product can be deposited in those tanks. In addition to issuing permits, conducting UST system inspections, and supervising tank removals, the OSFM determines UST Fund eligibility and deductibility for tank owners and operators. Since the regulations tend to overlap between the OSFM and the Illinois EPA, continued communication between the two agencies is crucial for effective implementation of the state program.

Organization

Located within the Illinois EPA's Bureau of Land, the LUST Section is one of three sections in the bureau's Division of Remediation Management (see Figure 2). Currently, the section is composed of thirty-four project managers, who are grouped into five units. Each unit is lead by a manager who, in turn, reports to the section manager.

Previously, the LUST Section was divided into four geographic units: South/Central, Northwest, Cook County (excluding the City of Chicago), and Chicago/DuPage County. The purpose of the four-region arrangement was to balance workload among project managers and facilitate the tracking of projects within the state (for example, a question about a project in Cook County was referred to the Cook County Unit).

The LUST Section underwent a reorganization to address the Abalance of workload@ issue because so many LUST sites are located in the Chicago metropolitan area. Project managers are now assigned projects on a rotating basis. This means not all LUST sites have an Illinois EPA project manager assigned to them; project managers are assigned as reports are received.

Assigning LUST sites on a rotating basis has given project managers a broad-based knowledge of issues specific to certain regions of the state. Examples of such issues include the use of risk-based remediation and different geologic and hygrogeologic conditions.

The LUST Section places a project manager on call every day to answer questions about the LUST program and LUST sites. The number to call is 1-217-782-6762 or toll free 1-888-299-9533. Plans are underway to publish a subset of the section=s database on the Illinois EPA=s web site, which should help with requests about the status of LUST sites.

Illinois EPA, Bureau of Land

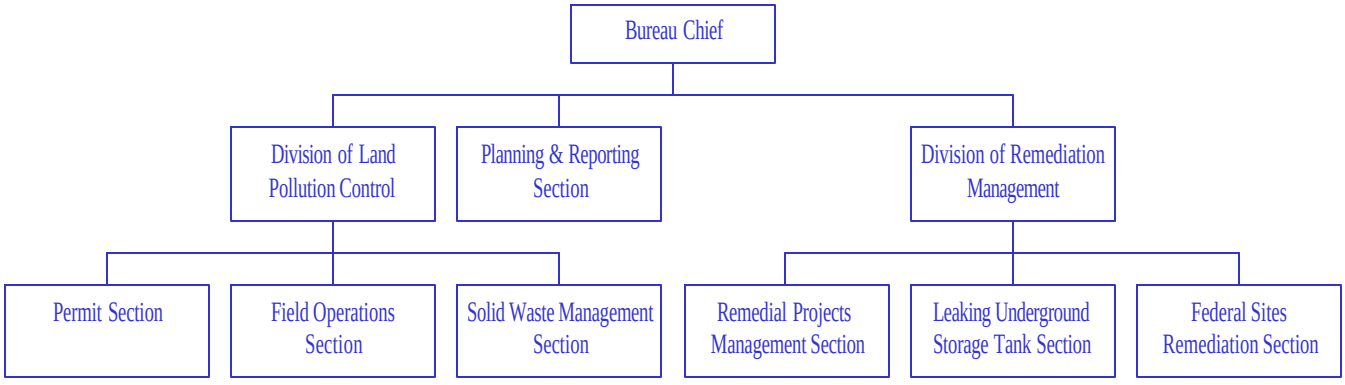

Figure 2

Statutory and Regulatory Authority

The Part 731 regulations have been in effect since 1989. Title XVI was signed into law on September 13, 1993, and the Part 732 regulations were adopted on September 23, 1994, and amended on July 1, 1997.

In 1984, Subtitle I of the federal Resource Conservation and Recovery Act (RCRA) called for the development and implementation of a regulatory program for 1) underground storage tanks containing regulated substances and petroleum and 2) releases of these substances to the environment. In 1986, Congress amended Subtitle I to incorporate a federally funded underground storage tank program to address releases from petroleum underground storage tanks. In 1987, the Illinois General Assembly enacted a law developing a state program to meet the objectives of the proposed federal underground storage tank program.

The LUST program obtains its statutory authority from the 415 Illinois Compiled Statutes 5/57, more commonly known as Title XVI: Petroleum Underground Storage Tanks of the Environmental Protection Act. The LUST program's regulatory authority comes from 35 Illinois Administrative Code Parts 731, 732, and 742. The Part 731 regulations have been in effect since 1989. Title XVI was signed into law on September 13, 1993, and the Part 732 regulations were adopted on September 23, 1994, and amended on July 1, 1997. Illinois rules and regulations meet the minimum requirements of the federal LUST rules and regulations. Part 742, a Tiered Approach to Corrective Action Objectives (TACO), was adopted on July 1, 1997. TACO is a risk-based method to develop cleanup objectives for contaminated soil and groundwater.

Owners and operators who report a release from a hazardous substance underground storage tank (UST) must comply with the Part 731 regulations. Owners and operators who report a petroleum UST release before September 13, 1993 may continue to follow the Part 731 regulations (Aold law@) or may choose to comply with Title XVI and the Part 732 regulations (Anew law@) by informing the Illinois EPA in writing of their choice. Owners and operators who report a petroleum UST release on or after September 13, 1993 must comply with Title XVI and the Part 732 regulations. Owners and operators of leaking USTs are encouraged to use TACO regardless of when they reported the tank release.

Tank Owner and Operator Requirements

Owners and operators who report new petroleum UST releases to the Illinois Emergency Management Agency (IEMA) must meet the requirements of 35 Illinois Administrative Code Part 732: Petroleum Underground Storage Tanks. Once notified of the release by the IEMA, LUST Section sends a technical forms packet to assist owners and operators in complying with the reporting requirements. By law, LUST Section Project Managers have 120 days to review and approve, modify, or deny all plans, budgets, and reports (except for 20 and 45-Day Reports, for which there is no deadline for review). The following presents a chronological explanation of the required reports, plans, and certifications.

20 Day Report: This is a one-page certification form specifically provided in the technical forms packet. The owner and operator must certify that the listed items on the form are true, then submit the form to the LUST Section within 20 days of the reported release date. This certification is to assure that all immediate threats to human health have been mitigated.

45 Day Report: Required to be submitted within 45 days of the reported release date, the 45 Day Report must contain information about the site and the nature of the release, including information gained during initial abatement measures.

Free Product Removal Report: When conditions at a site indicate the presence of free product (free product means petroleum not dissolved in water), the owner and operator are required to remove as much free product as possible and to submit a report within 45 days of the confirmation of the presence of free product. This report documents actions taken to remove free product and must be submitted for each occurrence of free product.

Site Classification Plan/Budget[1]: A proposal for activities to classify a site in accordance with the Part 732 regulations must be submitted to the LUST Section for approval[2]. Owners and operators must classify the UST release site into one of three categories: No Further Action, Low Priority, or High Priority. The site classification determines the type of corrective action, if any, that will be necessary.

Site Classification Completion Report: Upon completion of site classification activities, this report and a Professional Engineer Certification must be submitted for the site to be classified as No Further Action, Low Priority, or High Priority. Upon approval of a No Further Action classification, the owner and operator will receive a ANo Further Action@ letter. For Low Priority and High Priority classifications, additional plans and reports are required.

Low Priority Groundwater Monitoring Plan/Budget[1] **OR High Priority Corrective Action Plan/Budget**[1]: Depending on the site classification, the owner and operator must submit a plan for additional action. The Low Priority Groundwater Monitoring Plan will propose a plan to monitor the groundwater at the site for a period of three years. The High Priority Corrective Action Plan will propose some type of corrective action to remediate the site.

Groundwater Monitoring Report: For Low Priority sites only, an annual report must be submitted documenting groundwater monitoring activities.

Corrective Action Completion Report and Professional Engineer Certification: This report describes the corrective action performed, contains sampling results, and must be accompanied by a Professional Engineer Certification. An owner and operator may request a ANo Further Remediation@ letter upon the completion of groundwater monitoring for a Low Priority classification, the completion of the required remediation for a High Priority classification, or by remediating without classification[2].

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[1]A budget is not required if the owner or operator does not intend to seek reimbursement.

[2]Pursuant to 35 Illinois Administrative Code 732.300(b)(1), an owner or operator may choose to remediate soil and groundwater in accordance with the remediation objectives in 35 Illinois Administrative Code Section 732.408 without conducting site classification. However, if site classification is not conducted in accordance with the procedures established in 35 Illinois Administrative Code Part 732 and Title XVI of the Act, the owner or operator may not be entitled to full payment or reimbursement from the UST Fund, if a request for reimbursement is submitted.

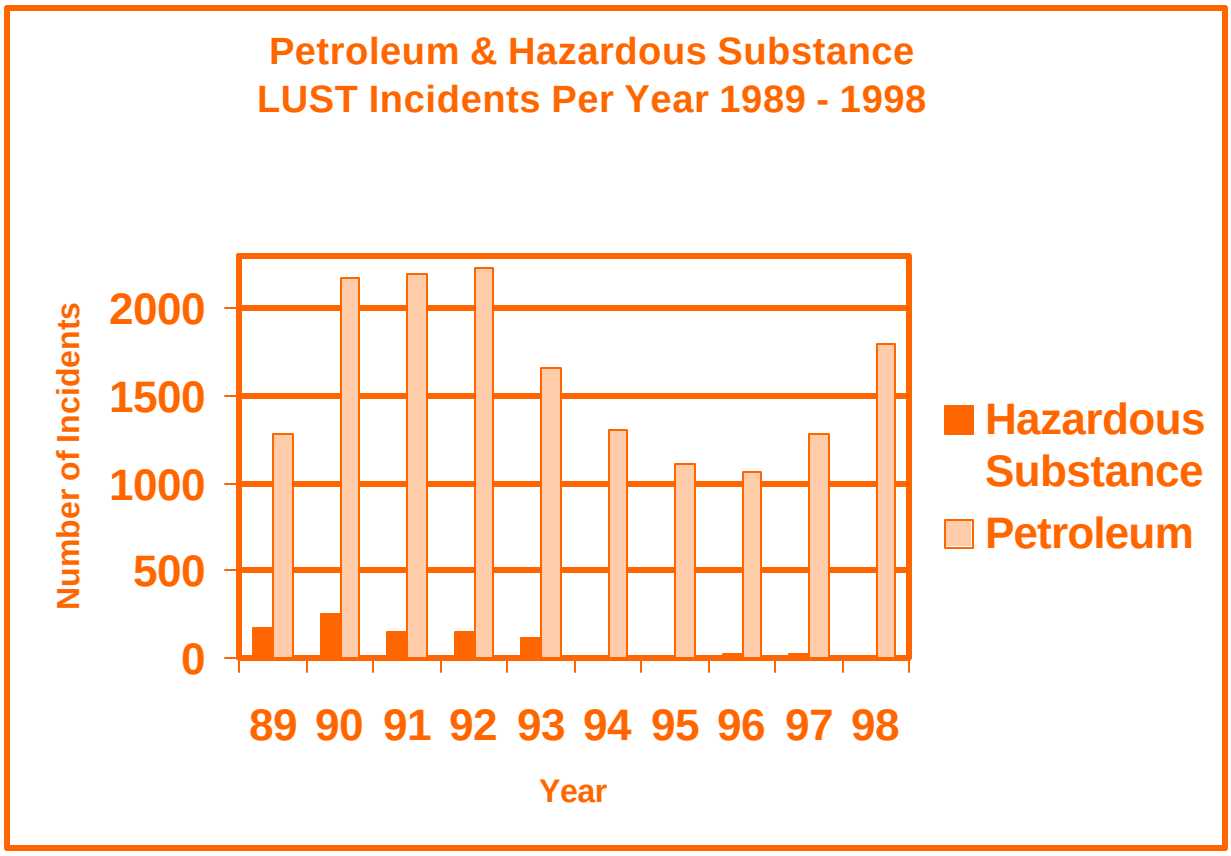


Figure 3

The number of reported LUST incidents hit a five-year peak in 1998.

LUST sites are properties where petroleum or hazardous substances (chemicals) have leaked from underground storage tanks and the Illinois Emergency Management Agency has been notified. The number of reported LUST incidents hit a five-year peak in 1998. This dramatic increase over previous years is likely due to the USEPA/Illinois Office of the State Fire Marshal requirement to upgrade underground storage tanks or to have them removed or taken out of service by December 22, 1998. Contamination is frequently discovered during upgrade and removal processes, resulting in a surge of reported LUST incidents for 1998.

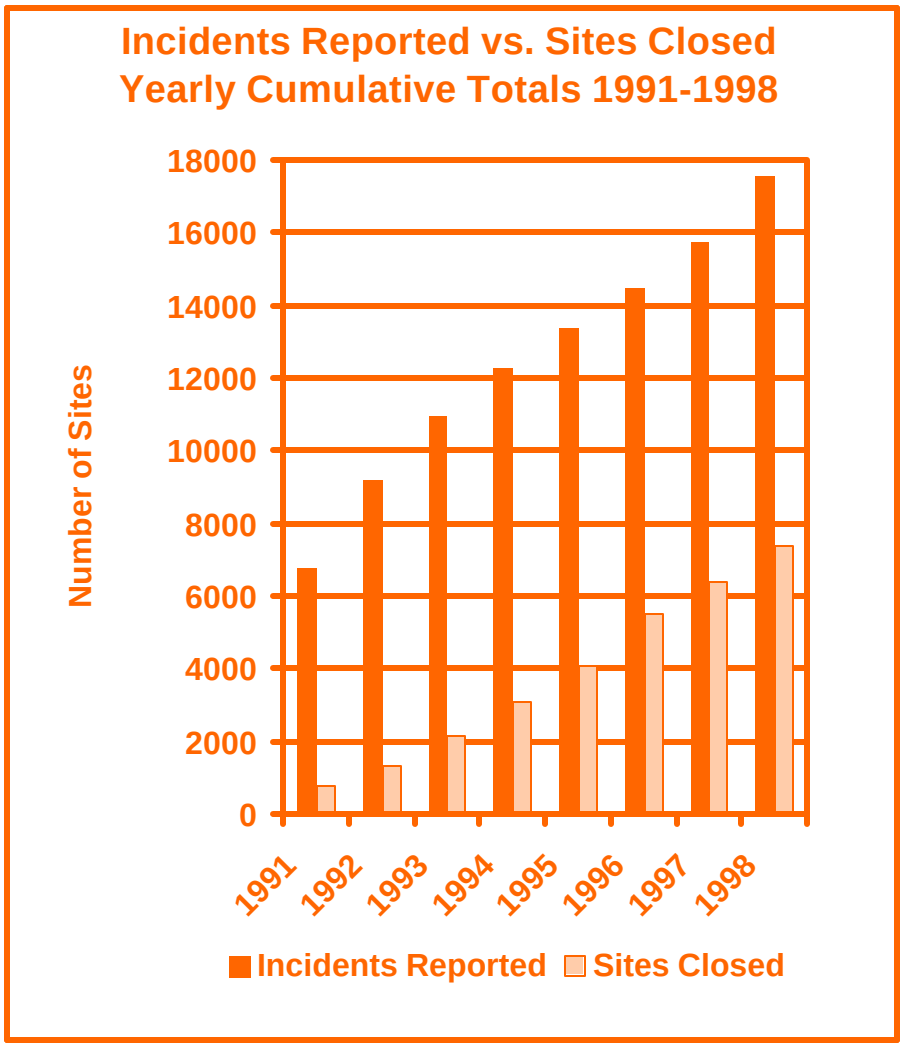


Figure 4

Reported incidents include both petroleum and hazardous substance tank releases. Closed sites are those that have either met the appropriate LUST remediation objectives and have been issued a ANo Further Action@ letter or a ANo Further Remediation@ letter, transferred out of the LUST Section into another program, or turned out to be non-LUST.

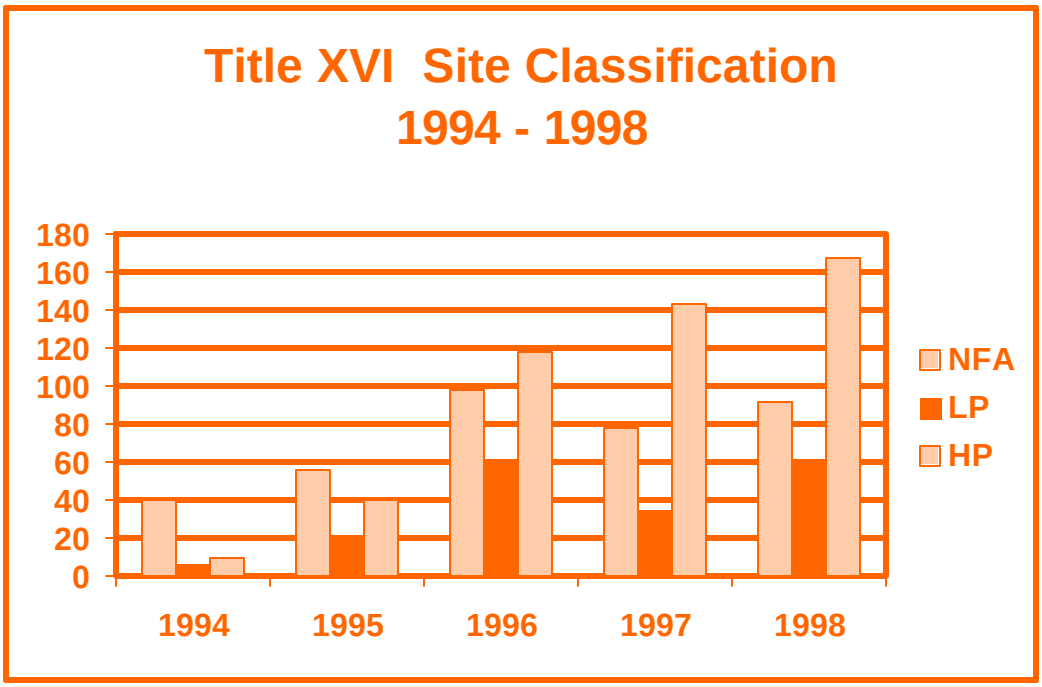


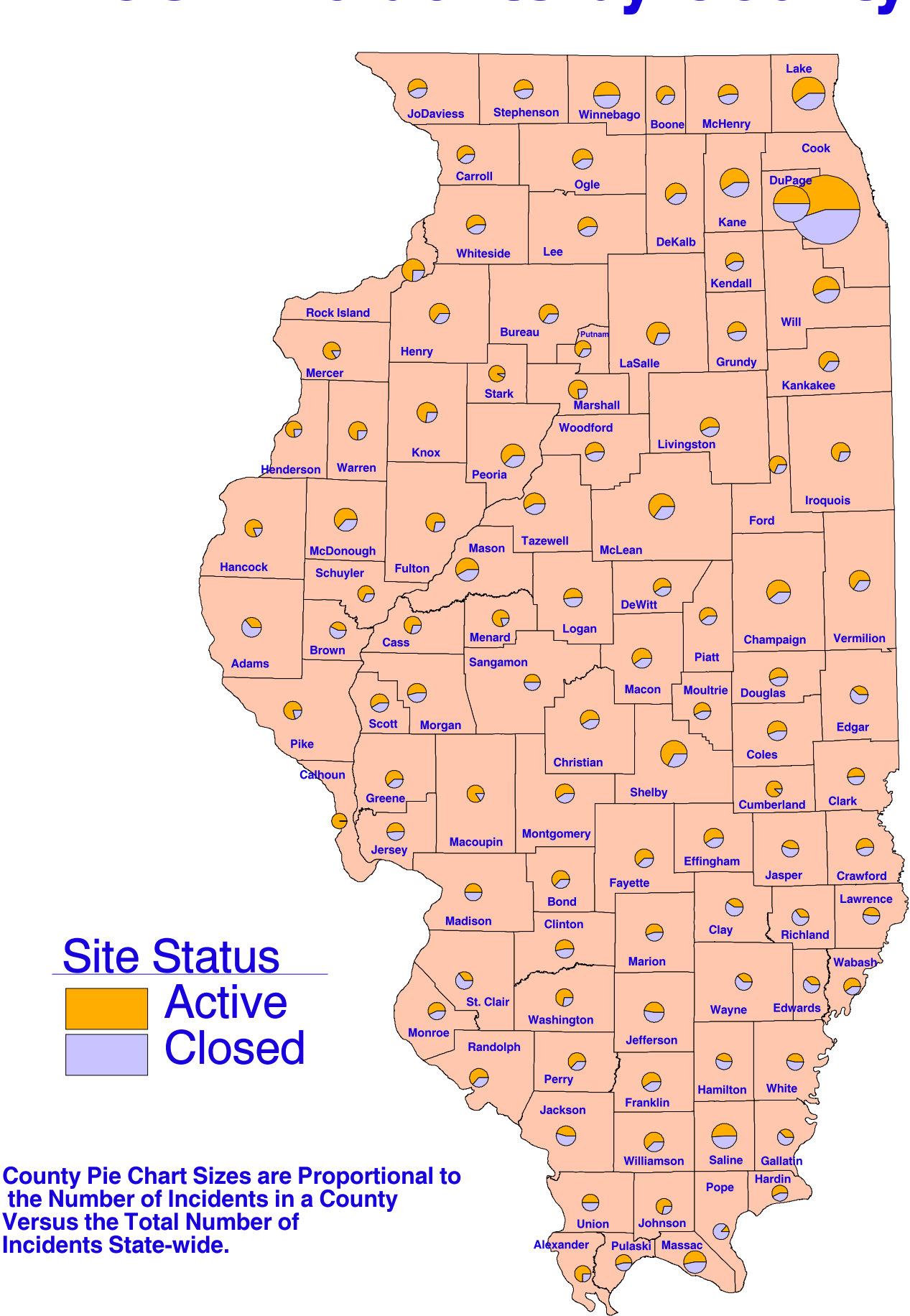
Figure 5

Data for 1993 were not included in the graph because Title XVI became law on September 13, 1993, and few sites completed site classification by the end of that year.

NFA: No Further Action. Sites not required to do additional corrective action beyond early action activities.

LP: Low Priority. Sites failing NFA status due to geology only, and consequently, required to monitor the groundwater for three years.

HP: High Priority. Sites failing NFA status due to geology, an existing high risk condition, or both that consequently require remediation.



Site Status

Active

Closed

County Pie Chart Sizes are Proportional to the Number of Incidents in a County Versus the Total Number of Incidents State-wide.

County	# Rptd	# Clsd
Adams	94	60
Alexander	12	3
Bond	40	15
Boone	57	20
Brown	14	8
Bureau	84	29
Calhoun	2	0
Carroll	41	16
Cass	31	9
Champaign	279	110
Christian	71	29
Clark	23	11
Clay	35	21
Clinton	55	26
Coles	91	40
Cook	6537	2916
Crawford	31	14
Cumberland	9	1
DeKalb	160	63
DeWitt	41	17
Douglas	47	21
DuPage	1299	653
Edgar	38	23
Edwards	13	8
Effingham	93	38
Fayette	60	22
Ford	36	11
Franklin	76	31
Fulton	72	20
Gallatin	8	5
Greene	37	14
Grundy	71	33
Hamilton	11	6
Hancock	32	6

County	# Rptd	# Clsd
Hardin	7	3
Henderson	13	3
Henry	115	40
Iroquois	66	19
Jackson	98	53
Jasper	22	12
Jefferson	116	61
Jersey	33	16
JoDaviess	74	32
Johnson	7	2
Kane	606	248
Kankakee	113	39
Kendall	48	20
Knox	113	30
Lake	965	389
LaSalle	232	73
Lawrence	19	10
Lee	85	36
Livingston	79	34
Logan	63	30
McDonough	234	86
McHenry	103	47
McLean	405	142
Macon	99	40
Macoupin	27	4
Madison	28	14
Marion	29	13
Marshall	71	16
Mason	251	106
Massac	214	101
Menard	20	4
Mercer	31	5
Monroe	30	13
Montgomery	74	30

County	# Rptd	# Clsd
Morgan	69	32
Moultrie	23	10
Ogle	110	45
Peoria	263	101
Perry	35	13
Piatt	30	12
Pike	47	10
Pope	8	7
Pulaski	11	5
Putnam	15	5
Randolph	63	23
Richland	20	13
Rock Island	224	59
St. Clair	31	20
Saline	351	172
Sangamon	10	5
Schuyler	13	4
Scott	48	20
Shelby	453	151
Stark	13	1
Stephenson	73	33
Tazewell	167	70
Union	18	9
Vermilion	139	48
Wabash	20	8
Warren	53	13
Washington	32	9
Wayne	21	13
White	19	10
Whiteside	76	32
Will	440	188
Williamson	97	37
Winnebago	432	213
Woodford	72	32

 # Rptd= Number of Incidents Reported

 # Clsd = Number of Incidents Closed

The UST Fund

Federal regulations require petroleum UST owners and operators to demonstrate the financial ability to remediate tank releases and to pay for damages to third parties. Federal UST regulations allow, but do not require, states to establish publicly financed UST funds. Illinois chose to set up such a fund to help tank owners and operators pay for cleaning up leaks from petroleum USTs.

In 1998, the Illinois EPA paid 1,121 LUST reimbursement claims worth $28.1 million.

Since its inception in 1989 and through the end of 1998, the fund has reimbursed 7,400 claims for a total of $292 million. Illinois generates money for the fund through a $.003 per gallon motor fuel tax and an $.008 per gallon environmental impact fee. While $45 million of the fund is available per year to pay for cleanups, the motor fuel tax and environmental impact fee are due to expire on January 1 of 2013 and 2003, respectively.

Currently, the fund is solvent enough to pay reimbursement claims as soon as the bills have been reviewed and approved. The LUST Claims Unit reviews costs submitted by eligible tank owners and operators seeking reimbursement from the UST Fund to determine if the costs are:

- Consistent with the associated technical plan;
- Associated with corrective action activities and materials or services provided or performed in conjunction with corrective action activities; and
- Reasonable and do not exceed the minimum requirements of the Environmental Protection Act and the regulations.

During 1998, the Illinois EPA received 1,406 LUST reimbursement claims worth $42.9 million. Additionally, the Illinois EPA paid 1,121 claims worth $28.1 million. As these figures suggest, UST owners and operators are being reimbursed in a timely fashion, allowing sites to be cleaned up more quickly and with fewer disruptions to owners and operators and their businesses.

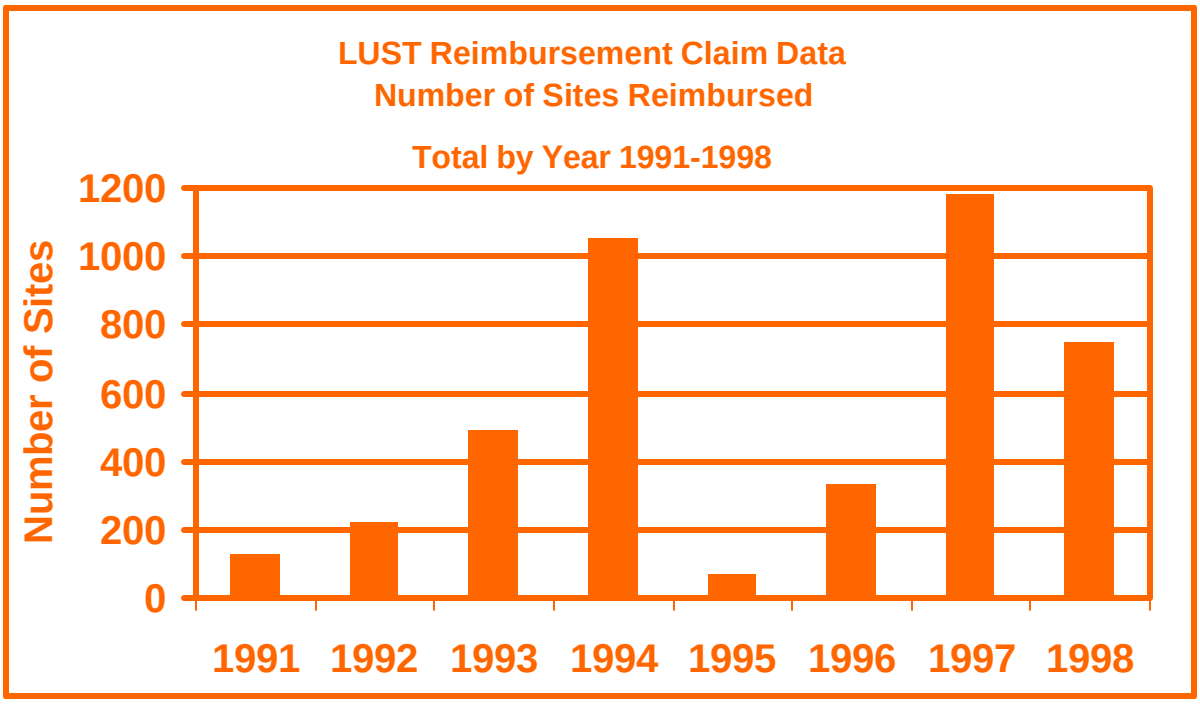


Figure 7

The large increases in number of sites reimbursed in 1994 and 1997 correspond to increases in UST Fund revenues. A bond issuance passed in September 1993, and the Environmental Impact Fee took effect on January 1, 1996.

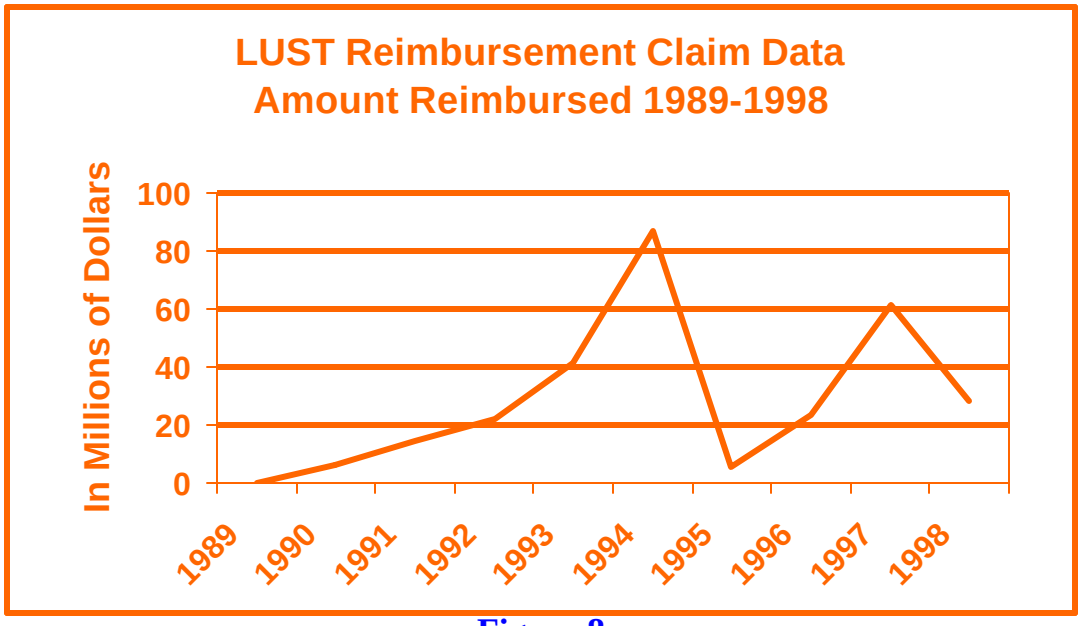


Figure 8

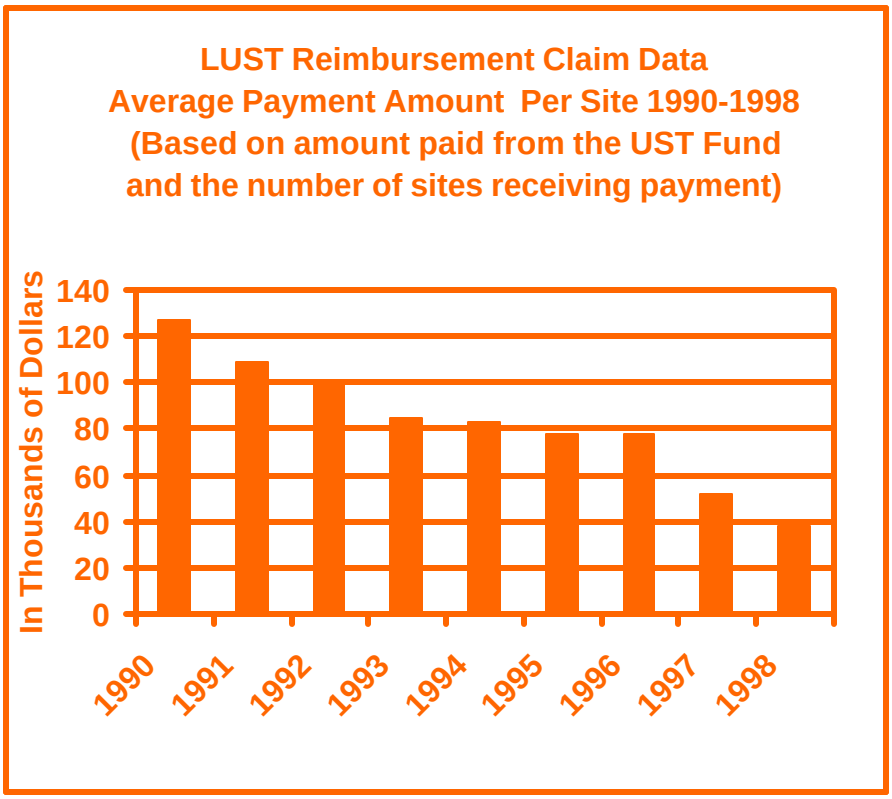


Figure 9

Figure 9 represents the average payment made from the UST Fund per site for a given year. Owners and operators may receive payments for a given site in multiple years. Therefore, the average payment amounts identified in Figure 9 do not represent the total average remediation cost per site. Our reimbursement database is being converted in 1999 and should allow more representative numbers in the future, though the decreasing trend in the average payment amount as shown in the graph likely translates to decreasing total average remediation costs.

Tiered Approach to Corrective Action Objectives

These cleanup objectives protect human health while taking into account site conditions and land use scenarios.

The primary goal of remediation is to manage contamination to prevent harm to human health and the environment. The Tiered Approach to Corrective Action Objectives (TACO), Part 742 is designed to allow more flexibility in the development of cleanup objectives by allowing the use of a risk-based, site-specific approach. These cleanup objectives protect human health while taking into account site conditions and land use scenarios.

TACO has three tiers that are generally progressive in the amount of site information required. However, these tiers need not be used in succession. There are also options available in TACO for exposure pathway exclusion and background level determinations.

The first tier of TACO provides a series of Alook-up@ tables based on land use, pathways of concern, groundwater class, and, in some cases, soil pH. Tier 2 provides the user with the equations that were used to develop the Tier 1 objectives, and allows for the modification of certain input values based on site specific information. Because Tier 1 uses conservative default values, Tier 2 may generate objectives better suited to actual site conditions. Tier 3 encompasses a wide variety of situations, which cannot be addressed under either of the first two tiers. Such situations may include physical or mechanical restrictions on remediation, formal risk assessments, common sense applications, or alternative models for developing objectives.

TACO applies to LUST sites proceeding under either Part 731 or 732. Under Part 731, TACO may be used to develop objectives for sites conducting remediation. In Part 732, TACO is used by sites classified as High Priority or sites electing to pursue remediation outside of the classification system [Sections 732.300(b)(1), 732.400(b), or 732.400(c)]. Also, the exposure pathway exclusion option in TACO has been incorporated as a new method of classification within Part 732.

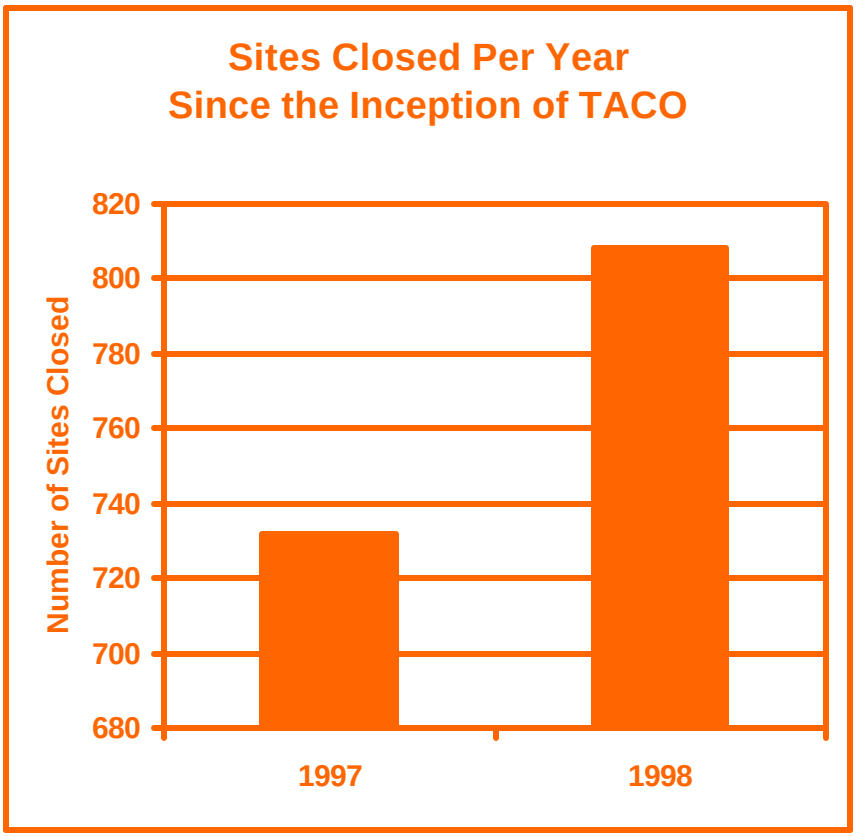


Figure 10

Use of TACO's flexible, risk-based approach by the LUST Section returns more sites to productive use. The number of No Further Remediation letters issued by the LUST Section increased by 10% from 1997 to 1998.

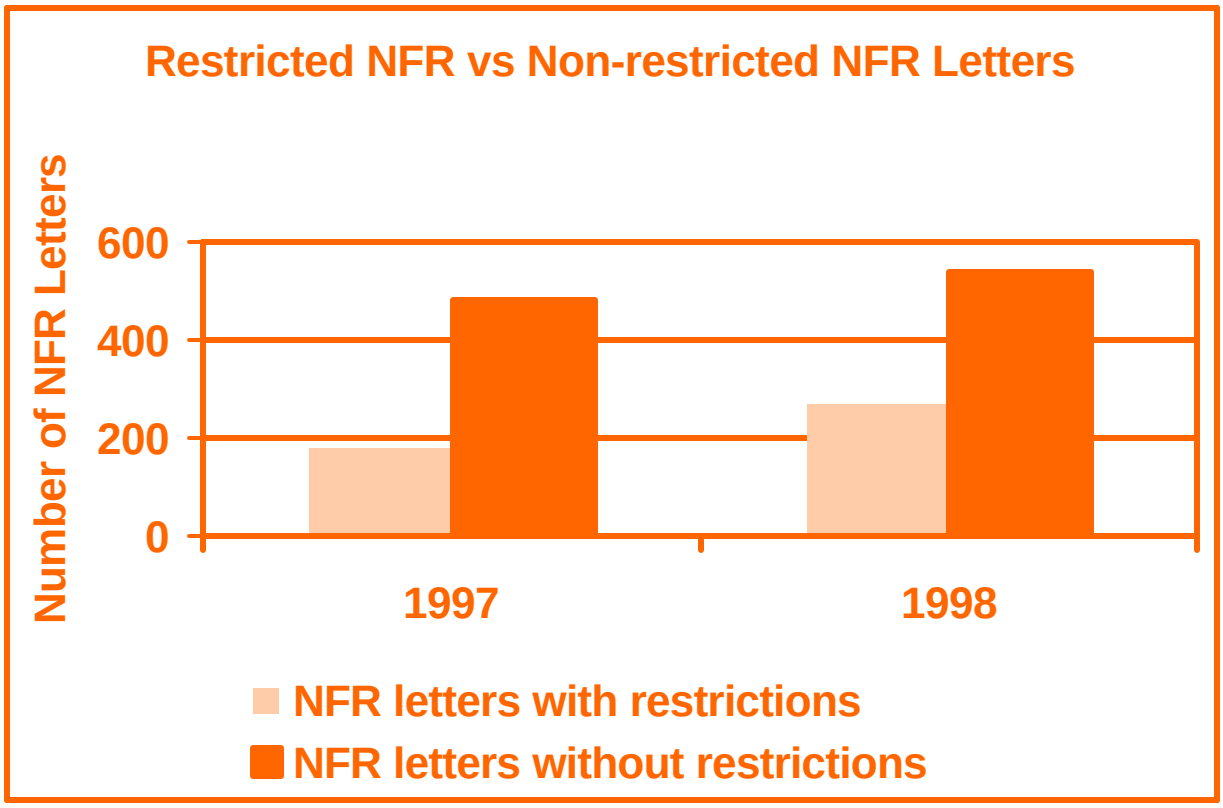


Figure 11

A Restricted NFR letter contains institutional controls to prevent exposure to remaining contaminants. An institutional control is a legal mechanism for imposing limits on land use, such as a deed restriction or local ordinance. For example, an institutional control could restrict a site to industrial/commercial use.

A Non-Restricted NFR letter does not contain site-specific restrictions.

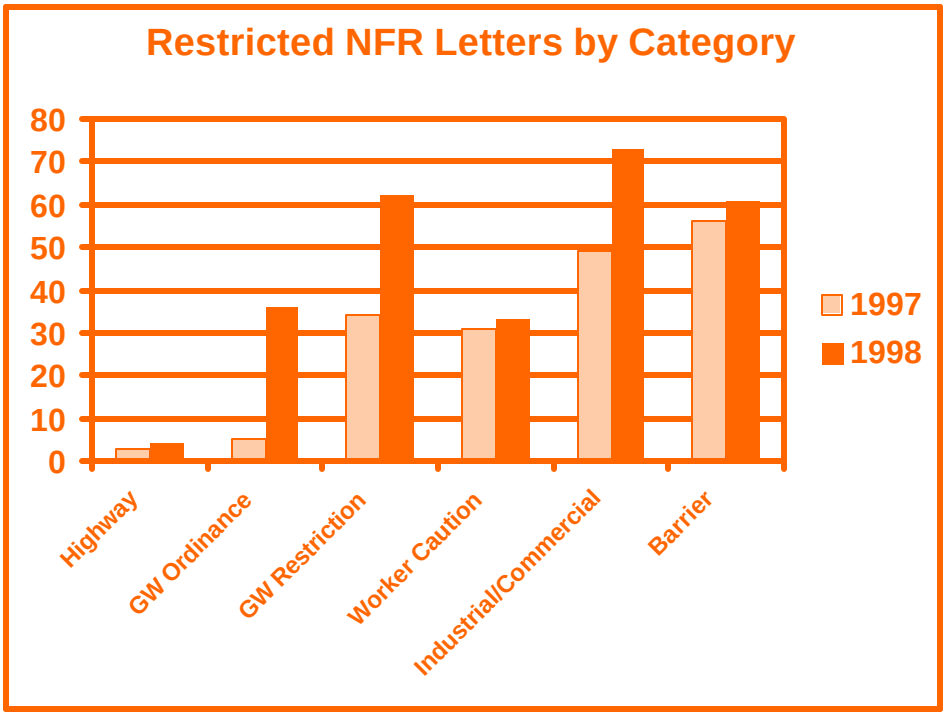


Figure 12

These restrictions are used to prevent exposure to remaining contaminants and may be used in combination.

Highway Agreement	A highway authority agreement prohibits the use of groundwater and limits access to soil contamination under a highway right-of-way.
GW Ordinance	A groundwater ordinance, adopted by local government, prohibits the installation and use of potable water supply wells, usually within the entire community.
GW Restriction	A groundwater restriction prohibits the installation and use of potable water supply wells, usually at the site.
Worker Caution	A worker caution requires a safety plan for the site to be implemented should any future excavation and construction activities occur within the contaminated soil.
Industrial/ Commercial	An industrial/commercial restriction prohibits residential use of the site.
Barrier	Barriers may include asphalt paving, concrete, permanent structures, or clean soil. An engineered barrier must be properly maintained to prevent the inhalation or ingestion of the contamination as well as impede the migration of contaminants.

The Illinois Brownfields Initiative

Beginning in 1998, the Illinois EPA offered grants worth a maximum of $120,000 each to municipalities for brownfields related activities, awarding its first grant to the City of Lockport to assess three abandoned gas stations.

Every city, no matter what its size or economic stature, has at least one. An abandoned commercial property that fails to attract redevelopers due to fears of environmental contamination. Properties like this, called brownfields, are a community problem. Brownfields pose a number of threats to a community=s well-being. Brownfield sites limit economic growth and development; deter potential investment and reduce employment opportunities when new businesses move elsewhere; potentially harm human health and the environment; attract vandals, gangs, and open dumping; and can depress the value of surrounding land.

The most common brownfield properties are closed gas stations. Beginning in 1998, the Illinois EPA offered grants worth a maximum of $120,000 each to municipalities for brownfields related activities. These activities include conducting a brownfields inventory, determining whether a brownfield site is contaminated, and if so, to what extent, and developing a corrective action plan for the site. Illinois EPA awarded its first grant to the City of Lockport to assess three abandoned gas stations.

The Illinois EPA=s efforts to resolve the problem of brownfields are known collectively as the Illinois Brownfields Initiative. In 1998, the LUST Section helped promote the cleanup and redevelopment of brownfield sites by:

- Encouraging the use of TACO to reduce remediation costs and perhaps hasten the cleanup process;
- Issuing No Further Remediation letters to qualifying LUST owners and operators to satisfy liability concerns;
- Hosting a LUST workshop to promote and advance the cleanup and redevelopment of brownfield sites at the Illinois EPA=s annual All Cities Brownfield Conference for municipalities; and
- Creating an exhibit on the Illinois Brownfields Initiative featuring closed gas stations for display at the Governor=s Tent at the Illinois State Fair.

Alternative Technologies

The Illinois EPA encourages the use of alternative remediation technologies in lieu of conventional soil landfilling and groundwater pump and treat systems to clean up LUST sites. Alternative technologies offer the advantage of breaking down contaminants, unlike landfilling, and are often much more effective for groundwater remediation than pump and treat systems. The alternative technologies described below have been used to remediate LUST sites in Illinois:

Bioremediation degrades petroleum contaminants by the controlled use of bacteria, nutrients and oxygen in the soil or groundwater to enhance and accelerate the natural process. Such bacteria use hydrocarbons as an energy source, transforming them into harmless substances.

Soil vapor extraction (SVE), also known as soil venting or vacuum extraction, is a method to remove volatile and semi-volatile contaminants from unsaturated soils. A vacuum pump is applied to extraction wells causing movement of vapors toward the wells. Extracted vapors are treated and discharged aboveground.

Bioventing is a method for enhancing biodegradation of organic contaminants from unsaturated soils. Oxygen and nutrients are injected into the soils through injection wells.

Landfarming, also known as land treatment or land application, involves spreading excavated soils in a thin layer aboveground. Microbial biodegradation of the contaminants is enhanced by aerating the soils (by tilling or plowing) and, if necessary, adding nutrients and moisture.

Biopiles, also known as biocells and compost piles, are excavated mounds of soils. Aerobic microbial activity is stimulated in the mounds through the addition of air and, if necessary, minerals, nutrients, and moisture.

Low-temperature thermal desorption, also known as low-temperature thermal volatilization and thermal stripping, uses heat to physically separate petroleum hydrocarbons from excavated soils. The vaporized hydrocarbons are treated again before discharge to the atmosphere.

Soil washing is a process for mechanically scrubbing soils to remove contaminants. Soil particles are separated from soil in an aqueous-based system. The wash water may be augmented with leaching agents, surfactants, pH adjustment, or a chelating agent.

Air sparging, also known as air stripping and volatilization, involves injecting air into the saturated zone through injection wells to transfer hydrocarbons from a dissolved state to a vapor phase. The vapors are then vented through the unsaturated zone and, in some applications, captured by soil venting systems.

Alternative Technologies Used at Ongoing LUST Site Cleanups

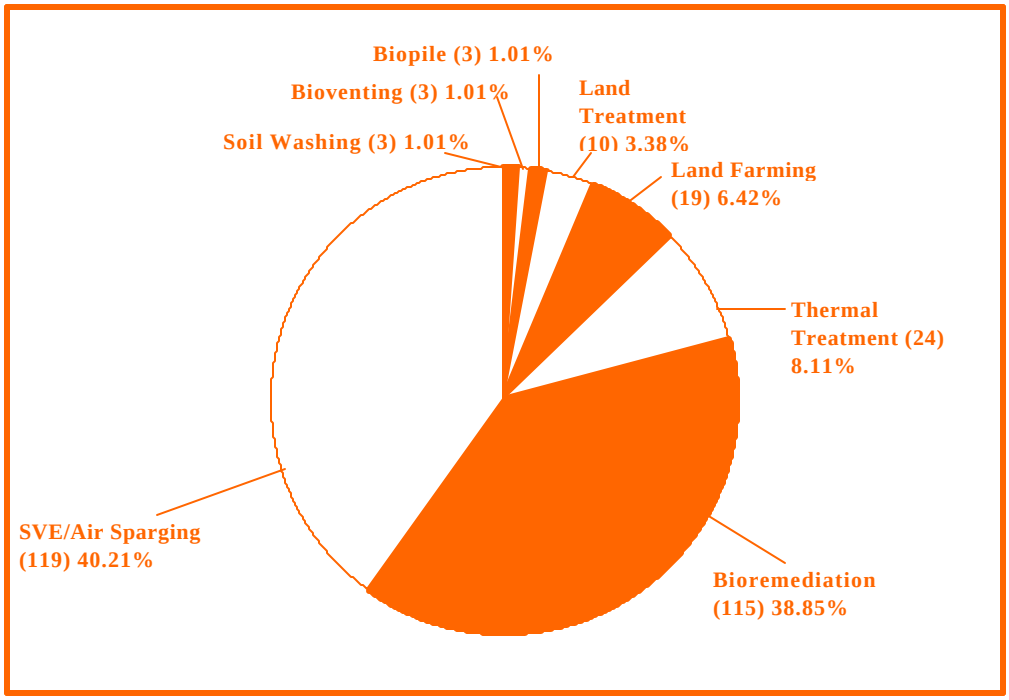


Figure 13

Alternative Technologies Used to Successfully Remediate LUST Sites

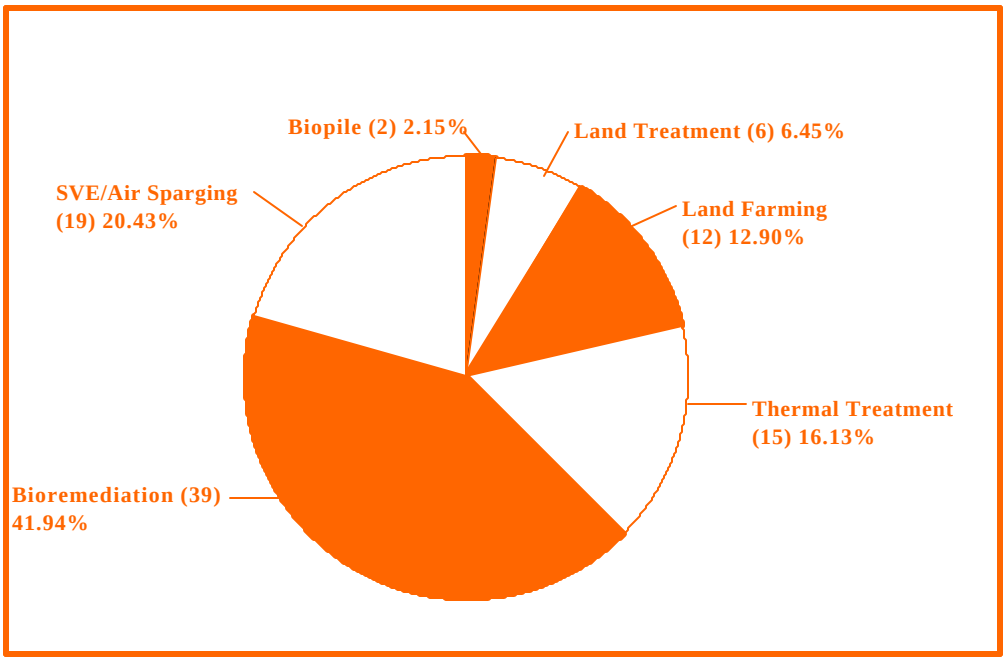


Figure 14

Outreach

In 1998, the LUST Section got wired, modifying its paper publications for use on the world wide web and creating links to the Office of the State Fire Marshal and the Illinois Pollution Control Board.

In 1998, the LUST Section published the following documents:

Guide to the Illinois Underground Storage Tank Fund
March 1998

The UST Fund Guide helps navigate tank owners and operators through the reimbursement process. Two thousand copies of the guide were given to the Office of the State Fire Marshal for distribution by its tank safety specialists to tank owners and operators.

The LUST Program: 1997 Annual Report
March 1998

The LUST Section produced its annual report for calendar year 1997, adding sections on TACO and Brownfields. The report summarizes the year=s most significant activities.

An Introduction to Leaking Underground Storage Tanks
April 1998

The LUST Section expanded this booklet, first published in 1993, to include a new section on TACO and more detailed information about tank owner and operator reporting requirements.

In August 1998, the LUST Section created an exhibit featuring closed gas stations to promote its cleanup incentives for display in the Governor=s Tent at the Illinois State Fair. Throughout the year, LUST Section staff accepted speaking engagements for trade associations, community groups, and other state agencies.

Two of our publications, the Introduction to Leaking Underground Storage Tanks and the UST Fund Guide, were modified for use on the Illinois EPA=s web site and are now accessible over the Internet.

The LUST Section spent the latter part of 1998 planning expansions to its home page and hopes to soon make the LUST reporting forms and a subset of the database available through the Internet.

Our Internet address is:

www.epa.state.il.us/land/underground-storage-tanks/index.html