BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	
PETITION OF COMMONWEALTH EDISON	)	R. 94-30
COMPANY FOR SITE-SPECIFIC	)	(SITE-SPECIFIC
REGULATION FOR EXISTING LANDFILLS	)	RULEMAKING)
AND UNITS:	)	
35 ILL. ADMIN. CODE 811.814	)	

PREFILED TESTIMONY OF FARRUKH M. MAZHAR AND ROBERT P. KEWER OF HARZA ENGINEERING COMPANY AND DAVID P. RUBNER OF COMMONWEALTH EDISON COMPANY AND EXHIBIT A TO THE TESTIMONY OF MR. MAZHAR AND EXHIBIT A TO THE TESTIMONY OF MR. KEWER

SIDLEY & AUSTIN

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WRITER'S DIRECT NUMBER
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June 20, 1995

Dorothy Gunn, Clerk
Illinois Pollution Control Board
Suite 11-500
100 West Randolph Street
State of Illinois Center
Chicago, Illinois 60601

Re: Petition of Commonwealth Edison Company for Site-Specific Regulation for Existing Landfills and Units: 35 Ill. Admin. Code 811-814

Dear Ms. Gunn:

We have enclosed for filing in the above-captioned matter, an original and four copies of the following documents:

1. PREFILED TESTIMONY OF FARRUKH M. MAZHAR AND ROBERT P. KEWER OF HARZA ENGINEERING COMPANY AND DAVID P. RUBNER OF COMMONWEALTH EDISON COMPANY, including Notices of Filing;

2. EXHIBITS FOR THE PREFILED TESTIMONY; and

3. CERTIFICATE OF SERVICE.

Thank you very much for your assistance with this matter.

Sincerely,

Alan P. Bielawski

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	
PETITION OF COMMONWEALTH EDISON	)	R. 94-30
COMPANY FOR SITE-SPECIFIC	)	(SITE-SPECIFIC
REGULATION FOR EXISTING LANDFILLS	)	RULEMAKING)
AND UNITS:	)	
35 Il.L. ADMIN. CODE 811.814	)	

NOTICE OF FILING

To: Judith S. Dyer
Illinois Environmental Protection Agency
2200 Churchill Road
P.O. Box 19276
Springfield, Illinois 62794

PLEASE TAKE NOTICE that on June 20, 1995 we filed with the Office of the Clerk of the Pollution Control Board, State of Illinois Center, Chicago, Illinois, Commonwealth Edison Company's PREFILED TESTIMONY AND ACCOMPANYING EXHIBITS for the hearing in the above-referenced matter, a true and correct copy of which is attached hereto and served upon you.

By: _____
One of the Attorneys for
Commonwealth Edison Company

Alan P. Bielawski
Marian E. Whiteman
Sidley & Austin
One First National Plaza
Chicago, Illinois 60603
(312) 853-7000
Dated: 6/20, 1995

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	
PETITION OF COMMONWEALTH EDISON	)	R. 94-30
COMPANY FOR SITE-SPECIFIC	)	(SITE-SPECIFIC
REGULATION FOR EXISTING LANDFILLS	)	RULEMAKING)
AND UNITS:	)	
35 ILL. ADMIN. CODE 811.814	)	

NOTICE OF FILING

To: Matthew Dunn, Chief
Environmental Control Division
Office of the Attorney General
State of Illinois
James R Thompson Center, 12th Floor
100 West Randolph Street
Chicago, Illinois 60601

PLEASE TAKE NOTICE that on June 20, 1995 we filed with the Office of the Clerk of the Pollution Control Board, State of Illinois Center, Chicago, Illinois, Commonwealth Edison Company's PREFILED TESTIMONY AND ACCOMPANYING EXHIBITS, a true and correct copy of which is attached hereto and served upon you.

By: _____
One of the Attorneys for
Commonwealth Edison Company

Alan P. Bielawski
Marian E. Whiteman
Sidley & Austin
One First National Plaza
Chicago, Illinois 60603
(312) 853-7000
Dated: 6/20, 1995

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	
PETITION OF COMMONWEALTH EDISON COMPANY FOR SITE-SPECIFIC REGULATION FOR EXISTING LANDFILLS AND UNITS: 35 ILL. ADMIN. CODE 811.814	)	R. 94-30 (SITE-SPECIFIC RULEMAKING)

NOTICE OF FILING

To: John Moore
Director
Energy and Natural Resources Department
325 W. Adams
Springfield, Illinois 62704-1892

PLEASE TAKE NOTICE that on June 20, 1995 we filed with the Office of the Clerk of the Pollution Control Board, State of Illinois Center, Chicago, Illinois, Commonwealth Edison Company's PREFILED TESTIMONY AND ACCOMPANYING EXHIBITS, a true and correct copy of which is attached hereto and served upon you.

By: _____
One of the Attorneys for
Commonwealth Edison Company

Alan P. Bielawski
Marian E. Whiteman
Sidley & Austin
One First National Plaza
Chicago, Illinois 60603
(312) 853-7000
Dated: 6/20, 1995

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	
PETITION OF COMMONWEALTH EDISON	)	R. 94-30
COMPANY FOR SITE-SPECIFIC	)	(SITE-SPECIFIC RULEMAKING)
STANDARD FOR EXISTING LANDFILLS	)	
AND UNITS 35 ILL. ADMIN. CODE	)	
811.814	)	

PREFILED TESTIMONY OF FARRUKH M. MAZHAR

1. Q: **Please state your name.**

   A: My name is Farrukh M. Mazhar.

2. Q: **Where are you employed and what is your title?**

   A: I am employed by Harza Environmental Services, Inc., located at 233 South Wacker Drive, Chicago, Illinois, 60606. I am a vice president of the company.

3. Q: **Please describe the positions that you have held with Harza and your responsibilities in those positions.**

   A: I have held the following positions at Harza Environmental Services, Inc.:

   Vice President and Section Head: May 1995 to present
   Senior Associate and Section Head: 1991 to May 1995
   Associate and Section Head: 1990 to 1991
   Section Head, Solid Waste and Geotechnical Section: 1986 to 1990

   As head of the Solid Waste and Geotechnical Engineering Section since 1986, my principal responsibilities have included directing and/or reviewing geotechnical investigations, feasibility studies, designs, and corrective action plans for solid and hazardous waste projects. My responsibilities also include project planning and management, and supervision of engineers, scientists, technicians and draftpersons.

From 1974 to May 1986, I was employed by Harza Engineering Company, the parent company of Harza Environmental Services, Inc. The following is a description of the positions held and the associated responsibilies:

Senior Geotechnical Engineer: 1980 to May 1986. Project Engineer or Lead Engineer on numerous geotechnical investigations, design and construction projects. In this position, I was responsible for technical work, and supervised junior engineers, technicians, and draftpersons.

Geotechnical Engineer: 1974 to 1980. Lead Engineer, or engineer directly responsible for field geotechnical investigations, design of water supply and flood control, dams and reservoirs, foundation designs and remediation treatments, and construction contract specification and drawings for several construction projects.

4. Q: **Please describe your undergraduate and graduate education.**

A: I have a Bachelor of Engineering in Civil Engineering from Karachi University, Pakistan, 1965, and Master of Engineering in Soil (Geotechnical) Engineering from Asian Institute of Technology, Bangkok, Thailand, 1969.

5. Q: **Please describe any additional training or licenses that you have received.**

A: I am a Registered Professional Engineer in the States of Illinois, Indiana, and Wisconsin. I have completed several technical "Continuing Education" short courses in landfill design, tailing impoundments, and other geotechnical/ environmental subjects. I also routinely attend seminars and conferences on solid and hazardous waste related topics.

6. Q: **Please describe any projects that you have undertaken at Harza involving the design of operations of landfills or surface impoundments.**

A: I have undertaken a number of landfill and surface impoundment design and remediation projects while at Harza. Representative projects, along with a brief description of my responsibilities, are as follows:

- ***Countryside Municipal Landfill, Lake County, Illinois.*** Principal reviewer for siting permit application and provided expert witness testimony on the design and operation of a proposed vertical and horizontal expansion of an existing landfill.

- ***City of Ann Arbor Municipal Landfills, Michigan.*** Responsible for composite liner system design, gas management system design and operation, perimeter slurry wall design, composite final cover system design, and operation plan for approximately 100 acre Phase III landfill. On other landfill assignments, acted as project manager and/or senior geotechnical reviewer for the design of multimedia cover and gas management system and conducted quality assurance audit during construction. Also directed preparation of a remedial action plan for groundwater contamination and provided expert witness testimony on implementation costs for remediation of on-site and off-site groundwater contamination.

- ***Lake County Municipal Landfill, Illinois.*** Responsibilities included all studies and analysis for liner design, leachate system design, gas management system design, cover design, operation plan, and closure and post-closure plan leading to submittal of a siting permit application for development of solid waste landfill.

- ***Retrofitting Chemical Plant Surface Impoundment, Indiana.*** Responsibilities included design analyses for double liner and leak detection system to retrofit surface impoundment in order to comply with RCRA requirements.

- ***Peoria Disposal Company, Illinois.*** Designed leachate containment and collection system and surface water impoundment/detention facility. Reviewed RCRA Part B permit application for the PDC#1 hazardous waste landfill.

- ***Chemical Plant Incinerator Ash Landfill, Indiana.*** Directed preparation of closure plan, design computation for double composite cover system, and preparation of specification and drawings for construction. Performed construction audit and certified closure construction.

- ***Paxton I and II Municipal Landfills, Illinois.*** Provided technical review and expert witness testimony on the design of a proposed vertical expansion on top of an existing landfill. Also reviewed closure plan for Paxton II and provided comments on potentially unstable slopes and estimated construction cost.

- ***Mine Tailing Disposal Impoundment, New Mexico.*** Performed stability analyses for the existing tailings impoundment and for future capacity.

I have also included my resume, which provides additional information about my background, as Exhibit A to this testimony.

Q: Describe the characteristics of a typical landfill.

A: The principal characteristics of a typical landfill include several distinctive engineering features and operational controls to handle and dispose of solid waste in an environmentally safe manner. Features such as liners, leachate and gas management systems, and an appropriate final cover system are installed in a typical landfill to minimize leachate generation and to mitigate potential of leachate and gas migration out of the landfill.

As a general rule, landfills are operated dry and only non-flowing solid waste is disposed in a unit. The waste is placed in layers and compacted. A daily cover is installed on all exposed waste surface by the end of each day to minimize odors and threat of fire. The daily cover also provides litter control and limits access by vectors.

In addition to other location requirements, landfills generally are to be located in an appropriate geologic setting with favorable hydrogeologic conditions (i.e., in clayey material with the landfill base situated substantially above a usable aquifer).

Typically, a groundwater monitoring program is implemented at a landfill during operations and the post-closure period.

Q: What are the distinctions between a landfill and a surface impoundments?

A: The following are the primary distinctions between a landfill and a surface impoundment:

- A fundamental distinction is that a landfill is an engineered facility specifically constructed to dispose of solid waste containing no free liquid and is operated dry. In contrast, a surface impoundment manages flowing waste, such as liquid waste or waste containing free liquid.

- A leachate collection system consisting of a drainage blanket and pipes is typically required and provided beneath the waste in a landfill. A surface impoundment is not provided with such a system, instead, the liquid level is controlled using a weir or pumps.

- In a landfill, waste is placed in layers and compacted, and all exposed waste surface is provided with a daily cover. In a surface impoundment, flowing waste is sluiced using pipes. As the waste settles, it compacts naturally. Daily cover is also not provided over the waste because it is always covered with free liquid.

9. Q: **In the course of your employment, have you become familiar with the Landfill Regulations contained at 35 Ill. Admin. Code Parts 810-815? Please describe, in general terms, what those regulations cover.**

A: Yes. During my employment at Harza, I have become familiar with the Landfill Regulations contained at 35 Admin. Code 810-815. Part 810 includes general provisions which are applicable to all solid waste disposal facilities regulated under Parts 811 through 815. Commonly used words or terms, such as "Solid Waste", "Disposal", "Landfill", "Surface Impoundment", etc., are defined in this part. A surface impoundment is not considered to be a landfill subject to Parts 811 through 815. This part is also not applicable to hazardous waste management facilities.

Part 811 contains regulations for New Solid Waste Landfills, including those specifically applicable to landfills for disposal of only inert waste and chemical and putrescible waste. The regulations cover location, design, and operating standards and closure and post-closure maintenance requirements. In Subpart C, applicable to all new landfills in which chemical and putrescible wastes are to be placed, the standards for liner system, leachate collection and disposal system, gas monitoring and management system, and final cover system are provided. This subpart also establishes groundwater quality and required monitoring standards. Operational standards for waste placement at the lowest part of the working face and its compaction, and stable working slope and daily cover requirements are also included. Subpart D of Part 811 covers standards for management of non-hazardous special wastes at landfills. Other subparts cover standards for Construction Quality Assurance Programs and Financial Assurance requirements. One of the central premises of the design and operating standards set forth in Part 811 is that the facility to which the standards apply manages the waste in such a way that its disposal occurs in dry form and that the waste is kept

isolated, as much as possible, from surface and subsurface water sources.

Regulations pertaining to information required to be submitted in a permit application by an applicant to develop and operate a landfill are covered in Part 812. Specific requirements for plans (maps), proposed operating procedures, closure and post-closure plans and cost estimates, and groundwater monitoring program for inert waste and chemical/putrescible waste landfills are covered in different subparts.

Application procedures to develop and operate a landfill and to modify or renew a permit are included in Part 813, Procedural Requirements for Permitted Landfills. Time schedule, standards for issuance or denial of a permit and permit appeal procedures are provided.

Landfill regulations contained in Part 814, Standards for Existing Landfills and Units, apply to all those existing facilities which are not new landfills as defined in Part 810. Specific standards in this part are applicable to landfills which must initiate closure within a defined time frame of two or seven years or may opt to remain open for more than seven years.

Certain notification procedures are required to ascertain the applicability of appropriate standards. For existing landfills which must initiate closure within seven years or may remain open beyond seven years, all of the requirements for new landfills in Part 811 apply with some specific exceptions. For example, standards for location, liner and leachate system, foundation and mass stability analysis, units with installed final cover and vegetation, and hydrogeologic investigations as required in Part 811 are not applicable to existing units that may remain open for more than seven years. However, these landfills are subjected to other standards to collect and manage leachate and to ensure stable slope. As with Part 811, these standards are based on the premise that wastes disposed in the landfill will be in dry form and kept isolated from surface and subsurface water sources. The standards also include basis for establishing a design period to provide financial assurance during operation and the post-closure care period.

10. Q: Please describe your understanding of the operations conducted by ComEd at the Joliet/Lincoln Quarry Site?

A: The Joliet/Lincoln Quarry Site receives only coal combustion by-products (bottom ash and slag) from ComEd's coal-fired Joliet power generating Stations 9 and 29. Edison began disposing ash at the Site in the West

Filled Area in the 1960's and continued its operations until 1975. During this period, flyash, bottom ash, and slag from the generating stations were mixed with water pumped from the Des Plaines River and sluiced through pipes to the West Filled Area. This area was separated from the Main Quarry by an ash berm. The ash settled while the sluice water drained through a pipe into a settling pond in the Main Quarry. When quarrying ceased in 1975, Edison obtained access to the remainder of the site and shifted ash disposal operations to the Main Quarry. At that time, Edison began collecting fly ash in dry form for re-use markets or disposal at an off-site commercial facility. The West Filled Area is covered with soil, graded to drain and vegetated.

From 1975 to present, Edison has operated the Main Quarry as a surface impoundment with ash (only bottom ash and slag) sluiced from the stations by pipelines discharging along the Quarry's south rim. Approximately 8 million gallons per day of sluice water is pumped from the Des Plaines River and is used for transporting ash and slag to the Main Quarry. When disposed in the quarry, solids from the sluiced ash and slag are allowed to settle, and the excess sluice (free) water is discharged by gravity via valved pipes to a settling pond in the North Quarry. From the settling pond, water is pumped back to the Des Plaines River under an NPDES permit.

Almost all of the ash disposed in the quarry is sluiced from the stations. However, a small amount is transported by truck and end-dumped from the east wall of the quarry on Brandon Road. This ash is taken from settling ponds at Joliet 29, used occasionally when the sluice system is down for maintenance. Excavation from the settling ponds usually is required once every few years. The dry ash transported to the site has the same composition as that which is sluiced to the site.

11. Q: In your view, do the Landfill Regulations address operations like those conducted at the Joliet/Lincoln Quarry Site? Why not?

A: In my opinion, the Landfill Regulations contained in Parts 810 to 815 of 35 Ill. Admin. Code do not address operations like those conducted at the Joliet/Lincoln Quarry Site. My opinion is based on reasons which are described below:

- As stated above, the Landfill regulations are written to address facilities into which solid waste containing no free liquid is placed. Edison's operations dispose of flowing combustion waste, a wet

disposal process, into an excavation, similar to the manner in which other surface impoundments are operated in Illinois.

- Other operational requirements in Part 814, Subpart C, pertaining to working face, compaction of waste, daily cover placement, and litter and vector control are all applicable to facilities which handle and dispose of solid waste containing no free liquid and are operated dry. Most of these requirements do not have a meaningful purpose when applied to Edison's facility. Because the ash is transported by sluicing, disposed wet and is covered by water in the impoundment, further waste compaction is not feasible.

- A daily cover also cannot be placed on waste as the waste surface is under free water. Furthermore, the ash contains no putrescible material which can decompose to cause malodor, gases, or other conditions to attract birds and vectors. The above-mentioned operational requirements are therefore unnecessary and do not apply to the Joilet/Lincoln Quarry Site.

EXHIBIT A

HARZA

FARRUKH M. MAZHAR
Vice President

Harza Environmental Services, Inc.: Vice President, 1995 to Present; Senior Associate, 1991-95; Associate, 1990; Solid Waste/Geotechnical Engineering Section, Head, 1986 to Present. Harza Engineering Company: Senior Geotechnical Engineer, 1980-86; Geotechnical Engineer, 1974-80. Government of North East State, Nigeria: Resident Engineer, 1970-73. Development Construction Corporation, Karachi, Pakistan: Senior Engineer, 1969-70. Asian Institute of Technology, Thailand: Laboratory Assistant, 1967-69. Asbestos Cement Industries, Karachi, Pakistan: Civil Engineer, 1966-67. Water and Power Development Authority, Pakistan: Junior Engineer, 1965-66.
Degrees: Master of Engineering in Soil Engineering, Asian Institute of Technology, Thailand, 1969. Bachelor of Engineering in Civil Engineering, Karachi University, Pakistan, 1965.
Languages: English, Urdu.
Professional Engineer: Illinois, Indiana, Wisconsin.
Professional Societies: American Society of Civil Engineers, International Society of Soil Mechanics and Foundation Engineering; U.S. Committee on Large Dams; Southeast Asian Society of Soil Engineering; Institute of .0Engineers, Pakistan.
Continuing Education: Landfill Design, 1988 (University of Wisconsin). Geotechnical Aspects and Reclamation of Tailings Impoundments, 1984 (University of Arizona). Cold Regions Geotechnical Engineering, 1982 (University of Illinois). Seismic Design and Analysis of Earth- and Rockfill Dams, 1982 (University of Missouri). Embankment Dams, 1975 (University of Missouri).

As Head of the Solid Waste/Geotechnical Engineering Section, Farrukh M. Mazhar is involved in all solid and hazardous waste management projects undertaken by HES. He provides direction and supervises a staff of engineers, technicians, and drafters in the preparation of siting studies, conceptual and preliminary design of disposal facilities, remedial action plans and construction oversight. He also supervises the preparation of detailed design studies and analysis, design and/or construction drawings, specifications, design reports, and contract documents for projects. This includes interfacing with client's technical staff, permitting/regulatory agencies, and contractors.

Mr. Mazhar has participated in all phases of solid waste/geotechnical work required for planning, design, and construction of various types of projects. He has worked on site investigations, field and laboratory testing, design and analysis of solid and hazardous waste disposal sites, foundations analysis, geosynthetic materials, stability of slopes, slurry walls, leachate collection and removal systems, landfill covers, and embankment dams. He has served as project manager on a variety of projects, made presentations to boards of consultants, and provided expert witness testimony on landfill design.

EXPERIENCE HIGHLIGHTS

Project Management

- Project manager on more than fifteen landfill design and flood control project assignments, including the multi site indefinite-delivery contract with the Illinois Environmental Protection Agency, and the indefinite-delivery contract for geotechnical design and field investigations with USACE, Omaha District. Responsibilities include client liaison, contractual and technical performance of the project team, coordination of activities within different engineering disciplines, and monitoring of budget and schedule (1986 to present).

Design and Analysis Assignments

- Oversees, reviews, and performs design studies and analyses for a variety of projects. Has prepared design and construction drawings, specifications, and design and construction control memoranda.

Solid/Hazardous Waste Management Projects

- Provided expert witness testimony on Remedial Action Plan and implementation costs for remediation of on site and off-site groundwater contamination associated with the City of Ann Arbor landfills, Ann Arbor, MI (1995)
- Reviewed and assisted in preparing a construction traffic management plan to handle traffic patterns for three separate contracts (Materials Recovery Facility, Landfill Gas to Energy system, and an upgradient slurry wall installation), which will be implemented concurrently at the City of Ann Arbor Landfills, MI (1994).
- Participated in market research and projections on availability of landfills capacity in northern and central Illinois, and anticipated disposal fee; estimated cost to dispose of municipal waste in area landfills in lieu of incineration for the next twenty years, for economic analysis to upgrade the Northwest Waste-to-Energy facility in Chicago, IL (1994).
- Reviewed siting permit application and provided an expert witness testimony on the design and operation of proposed vertical and horizontal expansion of an existing landfill in Lake County, IL (1994).

EXHIBIT A

HARZA

FARRUKH M. MAZHAR
Vice President

Environmental Services, Inc.: Vice President, to Present; Senior Associate, 1991-95; Associ- 990; Solid Waste/Geotechnical Engineering Se- Head, 1986 to Present. Harza Engineering Com- Senior Geotechnical Engineer, 1980-86; echnical Engineer, 1974-80. Government of East State, Nigeria: Resident Engineer, 1970-73. lopment Construction Corporation, Karachi, tan: Senior Engineer, 1969-70. Asian Institute of nology, Thailand: Laboratory Assistant, 1967-69. stos Cement Industries, Karachi, Pakistan: Civil neer, 1966-67. Water and Power Development ority, Pakistan: Junior Engineer, 1965-66.

es: Master of Engineering in Soil Engineering, Institute of Technology, Thailand, 1969. Bachelor gineering in Civil Engineering, Karachi University, tan, 1965.

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EXPERIENCE HIGHLIGHTS

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Solid/Hazardous Waste Management Projects

- Provided expert witness testimony on Remedial Action Plan and implementation costs for remediation of on-site and off-site groundwater contamination associated with the City of Ann Arbor landfills, Ann Arbor, MI (1995).
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- Participated in market research and projections on availability of landfills capacity in northern and central Illinois, and anticipated disposal fee; estimated cost to dispose of municipal waste in area landfills in lieu of incineration for the next twenty years, for economic analysis to upgrade the Northwest Waste-to-Energy facility in Chicago, IL (1994).
- Reviewed siting permit application and provided an expert witness testimony on the design and operation of a proposed vertical and horizontal expansion of an existing landfill in Lake County, IL (1994).

FARRUKH M. MAZHAR
Vice President

• Project manager for evaluating the seismic stability of the landfill cap and its foundation at Hamilton Air Force Base, Novato, CA (1992-93).

• Project manager for RI/FS for site characterization and innovative technologies assessment to remediate soil with slag containing primarily lead and zinc at an approximately five-acre Inland Metals site in Chicago, IL (1993 to Present).

• Project manager for closure of the City of Ann Arbor Phase II Landfill. Developed alternatives for multimedia cover including a geomembrane and a geocomposite liner and identified a technically acceptable and cost-effective option. Tasks include preparation of engineering design report, construction specifications and drawings, gas management plan, odor control plan, and construction quality assurance plan. Also provided construction oversight, construction certification, and complete construction documentation of site closure (1990-93).

• Project manager for remedial action plan for City of Ann Arbor Phase I Landfill. Tasks include performing site-specific risk assessment addressing groundwater, soil, sediment, surface water, air, and landfilled wastes; conducting feasibility study to develop and select remedial alternatives for media of concern identified in risk assessment, and preparing remedial action plan design report that included detailed conceptual design sketches for selected alternatives and performance specifications for selected process options. Review of field investigation for slurry wall, mix design studies in compatibility testing, slurry wall design, and construction contract document. Provide general oversight audits during construction (1990 to present).

• Project manager for Removal Action at metal reclamation facility near Little Rock, AR. Remedial plans including decontamination of site debris, removal and offsite disposal of PCB-contaminated soil, and stabilization of lead-contaminated soil and its disposal off site. Required preparation of detailed work plans, remedial design, plans and specifications, field oversight, and interaction with USEPA and auto parts site (1991-93).

• Project manager for review of construction schedule, cost estimates, construction and permitting programs, and contractor's progress payments for development of solid waste landfill in Illinois permitted under 1990 Subtitle G Regulations for Northern Trust Company (1992-93).

• Reviewed removal action plan of lead-contaminated material, excavation and material handling protocol, and closure activities for the Lincoln Park Gun Club, Chicago, IL (1993).

• Developed and evaluated alternatives, including cost estimates, for the Lincoln Quarry Disposal Facility to comply with Illinois Subtitle G Regulation for Commonwealth Edison, Joliet, IL (1993).

• Responsible for composite liner system design, gas management system design and operation, slurry wall design, operation plan, and a composite final cover system design, Ann Arbor Landfill, Phase III, MI. Reviewed existing design and provided recommendations for modifications (1989-90).

• Designed a covered collection and conveyance system (double containment pipe) with leak detection to intercept, collect, and convey contaminated seepage from a bluff. It also included investigation and design of a soil-bentonite slurry wall for containment purposes. The system is designed for expansion to add on future seepage locations, if required. Reviewed construction documents and audited construction progress for 1100-foot-long, and up to 58 feet deep, drilled-in-place, deep-mixed, soil-bentonite slurry wall in contaminated subsurface materials. Contaminated Seepage Collection System, IN (1989-92).

• Evaluated strength parameters, stability, and liquefaction potential analyses for existing tailings impoundment and future raising; performed planning studies for new disposal facility, Chino Mines Company, NM (1983-84).

• Project manager for feasibility study for Whitestown Landfill, an NYSDEC inactive hazardous waste landfill in Whitestown, NY. Project tasks included developing and evaluating remedial alternatives for landfilled wastes and contaminated groundwater, soil, and structures; preparing detailed cost estimates for each alternative; and preparing the feasibility study report (1989-90).

• Responsible for detailed closure plan, design computations and drawings, specification and contract documents, QAPP, and construction audit and certification of a composite liner cap over an existing incinerator ash (hazardous) landfill, IN (1989-90).

• Reviewed and provided comments to Illinois Environmental Protection Agency on the work plan, conceptual, preliminary, and final design of leachate collection system, and specifications for remedial action prepared by the engineering consultant for the city, Danville/H&L No. 1 Landfill, IL (1988-90).

• Participated in preparation of Engineering Evaluation/Cost Analysis (EE/CA) for remedial action consisting of removal and disposal of large quantities of PCB- and/or solvent-contaminated oily waste at a state superfund site, ILADA Energy Site, IL (1989).

• Prepared potential remedial technologies report and progressive capping plan, Whitestown Landfill, NY (1989).

• Provided expert witness testimony for the City of Chicago on the geotechnical design of a proposed vertical expansion on top of an existing landfill, Paxton Landfill Expansion, Zoning Hearing, IL (1989 to present).

• Reviewed proposed conceptual design of facility to store low-level radioactive tailings waste for IDNS. Supervised conceptual layout and preliminary cost estimates for disposing waste off-site at three alternative sites in three different states, Waste Disposal Alternatives, IL (1989).

• Prepared closure plan for landfill, which accommodated about 1 million yd^3 of material excavated from flood control detention basin project. Assisted in preparation of environmental assessment report for landfill for intended end use as golf course. Certified landfill closure and successfully assisted the Village in obtaining post-closure application approved by IEPA, Arlington Heights Landfill, IL (1987-89).

• Designed double-liner system with geomembrane and bentonite clay mat and leak detection to retrofit surface impoundment to comply with RCRA requirements. Developed design to keep impoundment in operation during construction. Retrofitting Surface Impoundment, IN (1988).

• Evaluated subsurface conditions in part of hazardous waste disposal landfill; designed leachate containment and collection systems and surface water detention facility; and reviewed RCRA Part B permit application, Peoria Disposal Company, IL (1983-88).

• Supervised sampling, evaluated analytical data, and prepared closure certification for site that was used for railroad car repairs, including painting, etc., GATX East Chicago Site Closure Certification, IL (1986).

• Prepared subsurface exploration and testing program and evaluation of test data; developed design concepts and criteria; designed computations for stability of excavation slopes, settlement, and leachate quantity; and prepared design of liner and leachate collection system, site development drawings, and operation plan leading to submittal of permit application for development of solid waste landfill, Lake County Landfill, IL (1986).

Water Supply/Flood Control Projects

• In charge of design of about 6,500-foot-long earthen levee and concrete wall along east side of Salt Creek, and design of dry-bottom, 136-acre-foot, off-channel reservoir to store flood water. Included stability analysis of levee and reservoir, design of slurry wall around detention basin, permitting assistance, preparation of construction drawings and specifications, and assistance during bidding and construction. Elmhurst Flood Mitigation Project, IL (1988 to present).

• Responsible for two contracts for design of flood protection berms and walls, permitting assistance, preparation of contract documents, design modifications during construction, and preparation of record drawings for City of Park Ridge, IL (1988-90).

• Responsible for layout and design of wet-bottom reservoir to store stormwater, evaluation of groundwater system, and seepage analysis to determine need for liner and underdrainage to maintain minimum pool. Provided characterization of excavation material for use in developing surrounding area into recreational facility and as capping material for existing landfill; prepared construction drawings and specifications; provided assistance during construction. McDonald Creek Project, IL (1986-90).

• Prepared field investigation program; supervised laboratory testing; evaluated strength parameters, static stability, and liquefaction potential analyses of the 12.5-mile-long main cooling reservoir embankment and its foundation; and provided instrumentation monitoring, underseepage evaluation, and recommendations for remedial works, South Texas Nuclear Power Plant Project, TX (1984-86).

Soil and Rock Tunnels

• Supervised planning of geotechnical investigation and testing, evaluated subsurface conditions, estimated surface settlements, analyzed tunnel support system, established loading criteria for connecting structures, drop structures, and 150-foot-deep shaft in overburden and rock, reviewed geotechnical design report and contract documents, continued geotechnical support during construction, Weller Creek Combined-Sewer Relief Project, IL (1991-95).

• Supervised preparation of investigation program and evaluation of subsurface conditions for soft-ground tunneling for 9-foot-diameter deep sewer for Basins S06 and S13; foundations analysis and geotechnical design parameters for connecting structures and drop shafts; and review of construction contract specifications and drawings; review of geotechnical design report; support during construction. Flood Relief Project, Evanston, IL (1990-91).

• Responsible for planning and geotechnical design of approximately 4,000 feet of 60- and 120-inch-diameter pipe jacked/tunneled combined-sewer in soft to very soft clays, connecting and outfall structure, and 215-foot-deep dropshaft in overburden and rock, with a live connection to an existing TARP System tunnel; reviewed geotechnical investigation program and evaluation of site conditions; established geotechnical design criteria; reviewed design analysis, permanent support system in soil and rock, and contract drawings and specifications; continued geotechnical support during construction, Evanston Flood Relief Project - Phase II, IL (1991-94).

• Supervised geotechnical investigation, planning and design studies for soft ground tunnel, connecting structures, and drop shaft with a live connection to TARP Tunnel System (1991).

• Supervised geotechnical investigation and testing program, geotechnical evaluations, analyses and design for approximately 6,300 feet of 108-inch-diameter tunnel and about 2,700 feet of 72-inch-diameter jacked pipe sewer, including shallow drop structures, and air vent shafts; technical specifications; continued support during construction, Evanston Flood Relief Project - Phase III, IL (1992-95).

• Responsible for geotechnical investigation program and design of 6,500 feet of 78- and 108-inch-diameter

tunneled sewer including drop structures and a connection to the TARP System. Similar services also provided for another phase, which included 3,300 feet of tunneled sewer of 78-inch-diameter, Evanston Flood Relief Project - Phase IV and V, IL (1993 to present).

• Selected cross section for 150-m-high (492-foot) dam; evaluated geotechnical properties of construction materials; performed foundation evaluation and treatment, settlement analysis, stability and tunnel deformation analyses, filter and slope protection design, and spillway foundation analysis and design; diversion tunnel analysis and design of temporary and permanent support system; and prepared contract documents and specifications, Al Wehdah (formerly Maqarin) Dam, Jordan (1979-80).

• Evaluated rock excavation slopes; performed foundation evaluation and treatment of a shear zone, wedge-type stability analysis; diversion tunnel temporary and permanent support system and prepared contract documents and specifications, Strontia Springs Project, CO (1976).

Multi-Purpose Hydro Projects

• Conducted underseepage study; reviewed and analyzed design studies for cutoff wall, wave height, riprap, and free board; reviewed construction drawings; and incorporated revisions, Yacyreta Project, Argentina/Paraguay (1982-86).

• Evaluated and interpreted field exploration and testing results, post-earthquake stability and liquefaction analyses, threshold earthquake for Santee North Dam. Evaluated various methods to improve seismic stability of Pinopolis West Dam, Santee Cooper Project, SC (1982--83).

• Performed additional instrumentation and selection of piezometers and stability analysis of spillway headworks, Bath County Pumped-Storage Project, VA (1981-82).

• Studied surface runoff and spring treatment on left abutment for river closure and cofferdam; responsible for slurry wall design and instrumentation evaluation and report during reservoir filling, 15 de Septiembre (formerly San Lorenzo) Project, El Salvador (1981).

• Evaluated construction materials for 16-m (53-foot) raising of existing 94-m-high (308-foot) dam, analyzed instrumentation data, and evaluated the behavior of the existing dam, King Talal Dam, Jordan (1981).

• Performed stability, settlement, transient seepage, and construction pore pressure analyses; prepared brief design report Guri Hydroelectric Project, Venezuela (1977).

• Performed analysis of soil test data; design criteria for three earth and earth/rock dams; design of water conveyance canal; and prepared contract documents and construction drawings, Lake Yojoa-Rio Lindo Project, Honduras (1974-75).

Site Investigations, Field and Laboratory Testing Assignments

Developed and reviewed site investigation programs, including field and laboratory testing for the following:

• Field investigation and soil testing programs for numerous solid/hazardous waste disposal sites (1986 to present).

• Static and dynamic stability analyses of Chino Mines Tailings Impoundment, NM (1983).

• Seismic evaluation and remedial measures of Santee Cooper Project, SC (1982).

• Field assignment to evaluate construction methods and recommend appropriate earthwork quality control tests for crushed sandstone for the Uribante-Doradas Project, Venezuela (1980).

• Field assignment to explore naturally occurring filter material for the Guri Hydroelectric Project, Venezuela (1980).

• Resident geotechnical engineering services for the investigation and field laboratory testing of construction material sources for Al Wehdah (formerly Maqarin) Dam, Jordan (1978-79).

Additional Experience

• Performed investigation and quality control testing and supervised field laboratory and construction activities for road construction project, Nigeria (1970-73).

• Performed investigations, analyses, and design for foundations of structures. Supervised construction of cast-in-place piles and *in situ* plate-bearing and pile-load tests; prepared reports on foundation designs. Resident engineer on a pile foundation contract for bridges in southwest Iran (1969-70).

• Student assistant in soil mechanics laboratory performing engineering properties tests, including triaxial tests for a research project (1967-69).

• Supervised pressure pipeline installation for water supply and designed steel and timber trusses for asbestos cement sheet roofing (1966-67).

• Surveyed excavation sections and supervised construction of tubewell house foundation and superstructure (1965-66).

TECHNICAL PAPERS AND ARTICLES

"The McDonald Creek Flood Control Project, Arlington Heights, Illinois: A Model Community Flood Mitigation Project," Association of Floodplains and Stormwater Management, 18th Annual Conference, 1994 (C.D. Smith, F.M. Mazhar, and D. Bowe).

"Geotechnical Aspects of Strontia Springs Arch Dam," proceedings of Session on Hydropower Recent Development, ASCE Spring Convention, Denver, CO, May 1985 (N.R. Hopton and F.M. Mazhar, co-authors).

FARRUKH M. MAZHA
Vice Presid

"Effect of Methods of Preparation on Index Properties of Lateritic Soils," proceedings of Session on Lateritic Soils, Seventh International Conference on Soil Mechanics and Foundation Engineering, Mexico City, Mexico, 1969 (Z.C. Moh and F.M. Mazhar, co-authors).

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	
PETITION OF COMMONWEALTH EDISON	)	R. 94-30
COMPANY FOR SITE-SPECIFIC	)	(SITE-SPECIFIC RULEMAKING)
STANDARD FOR EXISTING LANDFILLS	)	
AND UNITS 35 ILL. ADMIN. CODE	)	
811.814	)	

PREFILED TESTIMONY OF ROBERT P. KEWER

1. Q: **Please state your name.**

   A: My name is Robert P. Kewer.

2. Q: **Where are you employed and what is your title?**

   A: I am a Senior Associate at Harza Environmental Services, Inc., 233 S. Wacker Drive, Chicago, Illinois and I am head of its Geology/Hydrogeology Section.

3. Q: **Please describe the positions you have held with Harza and your responsibilities in those positions.**

   A: Since May of 1986, I have been employed by Harza Environmental Services, Inc. ("HES"). During that period, specific positions have included:

   - Senior Associate and Section Head: May 1995 to present.
   - Associate and Section Head: 1990 to May 1995.
   - Section Head: 1986 to 1990.

   As head of the Geology/Hydrogeology Section, I am responsible for directing all aspects of site investigations and groundwater evaluations at HES, including planning, project management, senior technical review, and supervision of staff scientists and engineers.

   During 1971 and 1972, and full-time from January 1974 to May 1986, I was employed by Harza Engineering Company. Positions held during

that period along with my principal responsibilities are as follows:

- Senior Engineering Geologist/Hydrogeologist: 1981 to 1986. Project manager or lead scientist on numerous environmental investigations and assessments and groundwater supply studies. In these positions, I was responsible for technical performance of all assigned aspects of the work, evaluation of results and preparation of reports.
- Engineering Geologist: 1974 to 1981. Served as staff or lead geologist on site investigations for numerous large civil structures (dams, etc.), environmental remediation projects, and groundwater supply studies, domestically and overseas.
- Field Geologist: 1971, 1972. Conducted field subsurface investigations at a pumped storage hydroelectric site in Pennsylvania.

4. Q: **Please describe your undergraduate and graduate education.**

A: I received a Bachelor of Science in Geology from Tufts University, Medford, Massachussetts in 1970 and a Master of Science in Geology from Rutgers University in New Brunswick, New Jersey in 1973.

5. Q: **Please describe any additional training or licenses that you have received.**

A: I am a Registered Professional Geologist/Engineering Geologist in the State of Oregon (#173) and a Certified Professional Geologist in the State of Indiana (#762). I have completed a number of short courses in a variety of groundwater and environmental subjects as well as 40-hour health and safety training and annual updates required by OSHA for hazardous waste projects.

6. Q: **Please describe any opportunities that you have had in the course o your employment with Harza, excluding opportunities at Joliet/Lincoln Quarry, to perform testing on groundwater at or near a landfill or surface impoundment.**

A: I have performed or directed hydrogeological investigations related to a number of operating or inactive landfills while at Harza. Included are the following.

- ***Peoria Disposal Company, Peoria, Illinois.*** Lead Hydrogeologis for groundwater investigations for RCRA permitting of the PDC#1

that period along with my principal responsibilities are as follows:

- Senior Engineering Geologist/Hydrogeologist: 1981 to 1986. Project manager or lead scientist on numerous environmental investigations and assessments and groundwater supply studies. In these positions, I was responsible for technical performance of all assigned aspects of the work, evaluation of results and preparation of reports.
- Engineering Geologist: 1974 to 1981. Served as staff or lead geologist on site investigations for numerous large civil structures (dams, etc.), environmental remediation projects, and groundwater supply studies, domestically and overseas.
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A: I have performed or directed hydrogeological investigations related to a number of operating or inactive landfills while at Harza. Included are the following.

- ***Peoria Disposal Company, Peoria, Illinois.*** Lead Hydrogeologist for groundwater investigations for RCRA permitting of the PDC#1

hazardous waste landfill in Peoria, including field permeability tests in borings and design of the site groundwater monitoring system. Responsibilities included planning and conducting field investigations, evaluating results, preparing relevant portions of the permit application document and technical discussions with Illinois EPA.

- ***Whitestown Landfill, New York.*** Lead Hydrogeologist for a comprehensive Remedial Investigation (RI) to address groundwater contaminated with metals and organic chemicals. Responsibilities included preparing work plans for submission to the state, directing field teams, analyzing results and preparing the RI report.
- ***Elmendorf Air Force Base, Alaska.*** Lead Hydrogeologist for investigation of a base landfill on the Knik Arm in Anchorage, among other site facilities. Responsibilities included planning the work, reviewing work plans, and assisting in analysis of results and report preparation.
- ***Ash Landfill (Eli Lilly & Company), Indiana.*** Project manager for groundwater flow studies, including limited field investigations and planning and installation of a RCRA groundwater monitoring system.
- ***City of Ann Arbor, Michigan, Landfills.*** Assisted Harza's project team on groundwater aspects of Ann Arbor's Phase I and II landfills, including geologic interpretations, groundwater flow, contamination and alternatives for remediation.
- ***Paxton I and II Landfills, Illinois.*** Providing expert witness services to the City of Chicago Department of Law regarding groundwater contamination and flow at two landfills in Chicago.
- ***Arlington Heights Landfill, Illinois.*** Lead Hydrogeologist for investigation of an existing landfill and documentation of closure with Illinois EPA. Responsibilities included planning the investigation, directing field personnel, and preparing the technical report.
- ***Gratiot County Landfill, Michigan.*** Lead Hydrogeologist providing technical advise to the Michigan Department of Natural Resources on containment of groundwater contaminated with organic chemicals.

I have also included my resume, which provides additional information about my background, as Exhibit A to this testimony.

7. Q: **Please describe the nature and dates of services that you performed for ComEd at the Joliet/Lincoln Quarry Site.**

A: In 1975-76, I served as Harza's hydrogeologist during site investigations relative to the Site's initial operating permit application to Illinois EPA. During this time, I conducted field investigations which established the basic geology and groundwater conditions at the Site, installed the original groundwater monitoring network, some of which remains in use, and prepared the technical portions of the permit application document.

From 1992 to the present, I have been Harza's project manager for ComEd's application for significant permit modification as well as providing technical support to its petition for site-specific rulemaking to the Illinois PCB. I was responsible for planning the 1992 site investigations and for directing Harza's staff in the field work, interpreting the results, and preparing the application documents.

8. Q: **Did you produce a report in connection with your recent investigation? Please provide the title of that report.**

A: Yes, a three-volume application for significant permit modification was prepared under my direction and was submitted to the Board as Exhibit 12 to the Petition to Designate the Joliet/Lincoln Quarry as a Surface Impoundment or, in the alternative, for site-specific rule-making. Volume II of this application addresses groundwater issues at the Site in a report entitled "Groundwater Protection Evaluation." This report includes major sections titled "Hydrogeological Report" and "Sampling and Analysis Plan".

9. Q: **Are the information and conclusions contained in the application discussed in question 9 true and accurate to the best of your knowledge?**

A: Yes, the information and conclusions contained in the application discussed in question 9 are true and accurate to the best of my knowledge.

10. Q: **Please describe the groundwater flow pattern at the Joliet/Lincoln Quarry Site.**

A: As described in more detail in sections 3.0 through 6.0 of the "Groundwater Protection Evaluation," provided in Volume II of ComEd's application, the landfill is located in a former dolomite quarry, bounded

and underlain by dolomitic rocks of the Silurian and upper Ordovician geologic systems. Because of the quarrying activities, there are no natural unconsolidated materials within the facility. The dolomites comprise the uppermost aquifer at the site and are underlain by shales of the Maquoketa Group. The Maquoketa Group is recognized as a regional aquitard, separating the dolomite from deep sandstone aquifers and forming the lower boundary of the hydrogeologic system examined in Harza's study.

Hydrogeologic subunits within the dolomite aquifer include upper and lower zones through which most groundwater flow occurs, separated by a middle low permeable zone. The low permeability zone acts as an aquitard in most of the site, although the two zones are interconnected locally.

Natural groundwater flow at the site is from the south to the north, discharging to the Des Plaines River. The quarries exert a profound influence on local flow patterns because water levels in the Main Quarry are kept below the adjoining groundwater table and the North Quarry is dewatered by pumping. Therefore, the quarries act as groundwater sinks, causing groundwater to flow inward from the south and east and restricting groundwater outflow toward the river. At the present time, the water level in the quarry is kept between elevations 549 and about 555 feet above sea level. Based on measured levels in Boyd's Quarry, just east of the Joliet/Lincoln Quarry Site, the water level in the quarry if allowed to fill naturally would approach about elevation 585 feet above sea level. The total groundwater flux in the dolomite around the landfill was estimated by Harza to be about 650,000 gallons per day (gpd), compared to the estimated 8 million gpd imported by Edison to the system from the river and later pumped from the North Quarry under the NPDES permit. Our evaluations also indicate that all of the groundwater from the Site discharges to the Des Plaines River by subsurface outflow, or discharges to ponds in the North Quarry, from where it is pumped along with the sluice water.

11. Q: **Please describe the surface water flow pattern at the Joliet/Lincoln Quarry Site.**

A: Surface water flow in the general area of the Joliet/Lincoln Quarry Site is northward to the Des Plaines River. However, surface water drainage in the immediate vicinity of the Site is controlled by the quarry itself and the other quarries in the vicinity. Because the quarry is lower in elevation than the natural ground surface, there is no surface water runoff from the

Site to surrounding areas. Surface water flowing into the quarry joins the sluice water and ultimately is discharged to the Des Plaines River under ComEd's NPDES permit. The West Filled Area of the Site also has been graded and vegetated so that any surface water runon to that portion of the Site is directed into the Main Quarry.

12 **Q: In the course of your investigation of the Site, did you detect a statistically significant increase in the concentration of any constituents above the background groundwater level? If so, which constituents and at what concentrations.**

A: Based on statistical analysis of upgradient and downgradient groundwater sampling results, Harza was able to document that the Joliet/Lincoln Quarry Site has had some degree of impact on sixteen parameters. These parameters were identified from comparison of the downgradient sampling results to the mean of all upgradient results at the 95% upper confidence interval. The impacted parameters are listed below, along with the highest concentration detected in any downgradient sample during the investigation and notes regarding whether Illinois Class I or II Groundwater Quality Standards were exceeded in any sample:

Ammonia	2.8 mg/l[1]
Arsenic	0.013 mg/l[2]
Boron	6.92 mg/l[3]
Cadmium	0.0027 mg/l[2]
Chloride	131 mg/l[2]
Fluoride	1.54 mg/l[2]
Manganese	0.23 mg/l[3]
Molybdenum	2.2 mg/l[1]
pH	8.91-6.74 units[2]
Potassium	35.8 mg/l[1]
Selenium	0.026 mg/l[2]
Sodium	210 mg/l[1]

[1] No Illinois Groundwater Quality Standards available for this parameter.

[2] Does not exceed Illinois Class I or II Groundwater Quality Standards.

[3] Exceeds Illinois Class I and/or Class II Groundwater Quality Standards in one or more samples.

Sulfate	440 mg/l[3]
Total Dissolved Solids	1,320 mg/l[3]
Total Organic Carbon	14.6 mg/l[1]
Zinc	0.18 mg/l[2]

This list shows that Illinois Groundwater Quality Standards were not exceeded for most parameters. With the exception of boron and sulfate, impacts for most of these parameters are slight and/or exceedences of groundwater standards were sporadic in time or location.

Q: What is the source of those constituents in the groundwater?

A: Data collected in the investigation indicate that most groundwater impacts are associated with the 14-acre portion of the former quarry referred to as West Filled Area. This area was filled prior to 1976 with bottom ash, fly ash, and slag and has been covered. Little impact is noted related to the active portion of the landfill, which contains only bottom ash and slag. This is particularly evident for parameters such as boron and sulfate which are clearly higher in concentration downgradient from the West Filled Area than beneath the North Quarry. As an example, boron concentrations in wells downgradient from the West Filled Area range from about 3 to 7 mg/l, while no sample exceeded 1.69 mg/l downgradient from the active quarry. The Class I and Class II groundwater standard for boron is 2.0 mg/l.

Q: To what extent do current Site operations add to those constituents in the groundwater?

A: In my opinion, current Site operations do not contribute significantly to the concentrations of these constituents in groundwater. Analysis of the bottom ash and slag deposited in the active part of the quarry indicates that the principal constituents of concern are not elevated and, therefore, the active part of the quarry does not appear to be a significant source of further contamination. This is corroborated by the lack of substantial impact on groundwater downgradient from the active part of the quarry as opposed to the West Filled Area. On the other hand, ComEd's operation of the Site maintains the quarry as a local groundwater sink, which helps control movement of groundwater from the site. This appears to be one favorable aspect of continued operation of the Site on groundwater quality.

Q: **Please describe the environmental impacts, if any, attributable to these contaminants.**

A: In my opinion, the potential for adverse environmental impacts due to the facility is minimal. There are no undisturbed lands within or downgradient from the site, primarily due to the existence of the former quarrying operations, Edison's generating station 9, and related development. The Des Plaines River is the only significant environmental receptor for water from the landfill. The contribution to the river from subsurface discharge is a fraction of that pumped from the facility to the river under a current NPDES permit and an even smaller fraction of total flow in the river. There are no other known sensitive environmental receptors potentially affected by the site. Analysis of material currently being placed in the quarry also indicates little potential for further degradation of groundwater quality due to current operations.

EXHIBIT A

HARZA

ROBERT P. KEWER

Senior Associate, and Head-Geology/Hydrogeology Section

Harza Environmental Services, Inc.: Senior Associate, 1995 to Present; Associate, 1990-95; Geology/Hydrogeology Section, Head, 1986 to Present.
Harza Engineering Company: Senior Hydrogeologist, 1984-86; Senior Engineering Geologist, 1981-84; Engineering Geologist, 1974-81; Field Geologist, 1971-72.
Degrees: Master of Science in Geology, Rutgers University, 1973. Bachelor of Science in Geology, Tufts University, 1970.
Languages: English, Spanish.
Professional Engineering Geologist: Oregon.
Certified Geologist: Indiana.
Professional Societies: Association of Engineering Geologists, National Water Well Association.
Continuing Education: Seminar on Site Characteristics for Subsurface Remediations, 1989 (U.S. EPA). Groundwater Pollution and Protection, 1988 (Association of Engineering Geologists). CHMM Review Course, 1988 (Illinois Institute of Technology). Subsurface Monitoring Technology, 1983 (University of Wisconsin). Groundwater Analysis and the Design of Dewatering Systems, 1976 (University of Missouri). 40-Hour General Site Worker Program, 1989, and refresher (University of Illinois).

As Head of the Geology/Hydrogeology Section, Robert P. Kewer is responsible for planning, implementation, and review of all groundwater studies at HES and supervision of staff hydrogeologists.

Mr. Kewer has served as project manager on many assignments. His experience and capabilities cover all aspects of hydrogeology, including groundwater resource evaluations, environmental property assessments, soil and groundwater contamination investigations, evaluation of waste disposal sites, groundwater monitoring, remedial investigations, and groundwater remediation.

EXPERIENCE HIGHLIGHTS

Solid and Hazardous Waste Disposal Projects

• Lead hydrogeologist for design of RCRA groundwater monitoring systems at a chemical plant in Indiana. Developed draft groundwater monitoring plans for underground tank farms, impoundments, and an ash landfill. Subsequently developed final monitoring plan for closure of the ash landfill, and directed installation of 12 monitoring wells in four clusters (1985 to present).

• Lead hydrogeologist for multiple assignments at th
Peoria Disposal Company RCRA Landfill, IL:
Directed site groundwater investigation;
Prepared hydrogeology sections of the RCRA Permit
Application;
Conducted groundwater quality assessments;
Prepared RFI Work Plan for off-site sanitary landfill;
Provided input to flow and transport model;
Installed leachate recovery wells;
Prepared annual groundwater monitoring reports; an
Assisted in contacts with U.S. EPA and IEPA.
Site received one of the first Part B Permits to be issue
(1984-91).

• Provided expert witness testimony for the City of C
cago at zoning hearings for an existing landfill (1989).

• Lead hydrogeologist for proposed Lake County, IL
Municipal Landfill. Planned and directed field investiga
tions and prepared hydrogeology sections of permit ap
cation to IEPA. Developed groundwater monitoring we
system. Provided expert witness testimony at public s
hearings (1987).

Contamination/Monitoring/Remediation Projects

• Project manager of property assessment, RCRA cl
sure activities, and investigation of TCE release at a G
eral Electric plant in Illinois (1991 to present).

• Lead hydrogeologist for corrective action at DuPon
Chemical Plant WV. Examining alternatives for groun
water containment and collection (1991 to present).

• Project manager for groundwater modeling study c
industrial site in Tucson, AZ. Direct technical support
expert witness testimony (1990 to present).

• Directed groundwater assignments at a chemical p
in west-central Indiana. Initial studies included installa
of observation wells, flow analysis, and development c
draft monitoring plans for site facilities. Later assignm
included installation of RCRA groundwater monitoring
system for closure of an ash landfill; flow analysis and
particle tracking models to assess methylene chloride
release from an underground storage tank; and devel
ment of flow and transport models to further evaluate
groundwater conditions and potential contaminant tra
port sitewide (1986 to present).

• Project manager for multiphase remedial investiga
at an operating chemical plant in Indiana. Soil and
groundwater are contaminated with volatile organics,
which have migrated to adjacent areas.

ROBERT P. KEWER

Senior Associate, and Head-Geology/Hydrogeology Section

Site work has included drilling and well installation, aquifer tests, geophysics, sampling and analysis, flow and transport modeling, installation of recovery wells, bench-scale testing of *in situ* bioreclamation, and evaluation of other remedial technologies for sitewide corrective measures.

Provided assistance in facility RCRA permitting; consulted on underground process storage tank leaks; prepared quarterly groundwater monitoring reports; and assisted in negotiations with IDEM and U.S. EPA (1984 to present).

- Project manager for RI/FS at the Behn Drum SRAPL site, IL. Work includes installation of monitoring wells; sampling of soils, sediment, surface water, and groundwater; and Risk Assessment (1991-92).
- Project manager for investigation of soil and groundwater contamination at a planned substation in Illinois. Work included six monitoring wells and sampling of soil and groundwater (1991).
- Directed environmental investigations at an equipment manufacturing plant in DeKalb, IL. Work included soil borings, monitoring wells, and sampling to characterize organic and metals contamination. Preliminary cost estimates were developed for a possible interceptor trench system (1990).
- Project manager for soil investigation of above-ground fuel storage facility, Vigo County, IN. About 12,000 yd^3 of fuel-oil-contaminated soils were known to be present, and additional contamination from off site was possible. Six monitoring wells were installed to identify groundwater flow patterns. Soil and groundwater samples were collected to identify contamination elsewhere. Site and area data were compiled for submission to IDEM. On-site soil treatment technologies were examined and preliminary cost estimates prepared (1990).
- Site manager for remedial investigation of the refinery products site in Schiller Park, IL, conducted by Illinois Environmental Protection Agency. Study addressed the presence and extent of subsurface soil and groundwater contamination using drilling and sampling of borings and monitoring wells and collection of soil and groundwater samples for analyses (1989).
- Whitestown Landfill RI/FS, NY: Participated in development of RI work plans, potential remedial technologies report, and a solid waste management plan. Directed and reviewed results of multimedia field investigations, including ambient air and soil gas surveys, test pits, drilling and monitoring well installations, sampling, and analysis. Prepared Phase I of the RI report (1988-89).
- Lead hydrogeologist for investigation and monitoring of the Arlington Heights Landfill, IL. This closed landfill was being used for placement of clay soils generated during excavation of a water retention lake. Prior to clay placement, site investigations defined site soil and groundwater conditions, identified the presence of landfill gas, installed a site groundwater monitoring system, and assessed possible contamination in adjacent underground utilities (1988).
- Lead hydrogeologist for remedial investigations at the Elemendorf Air Force Base, Anchorage, AK. Participated in planning and directing drilling and installation of groundwater monitoring wells on an on-base landfill, underground fuel storage tanks, and a burn pit. Sampling included soils, groundwater, drums, tanks, and wastes (1988).
- Office analyst of PBB contamination of glacial aquifers from the Gratiot County Landfill, MI: Study resulted in recommendations for remedial treatment that were performed by the Michigan Department of Natural Resources (1978).
- Project manager for a hydrogeologic study of potential groundwater contamination from fly-ash disposal at the Lincoln Stone Quarry, IL. Study resulted in licensing of the facility as a disposal site (1976).
- Resident geologist during a study to evaluate contamination of alluvial aquifers from a chemical plant in Kentucky. Study resulted in recommendations for remedial treatment and aquifer protection and for upgrading water supply from shallow wells (1975).

Groundwater Resource/Flow Projects

- Participated in preparation of a study plan for development of groundwater supplies needed for construction of the Yucca Mountain High Level Radioactive Waste Facility, NV. Participated in technical review of study plans authored by others in the areas of saturated and unsaturated zone flow (1990 to present).
- Lead hydrogeologist for groundwater flow analysis to estimate inflows to a proposed dolomite quarry expansion in McHenry County, IL. Vulcan Materials Company was considering deepening and expanding the quarry and had identified high heads beneath the existing pit. Bulk rock mass permeability and piezometric heads were determined from measurements and packer tests in six coreholes. Seepage estimates indicated modest inflows, and cost estimates for pumping were generated at various stages of pit development (1990).
- Lead hydrogeologist for review of aquifer test data and analysis of potential seepage losses from a surface stream proposed for water distribution use for the City of Decatur, IL. Work included test data review and analysis of results, review of site characteristics, and installation of observation wells to establish groundwater flow at the stream (1989).
- Planned, conducted, and analyzed pumping tests for the City of St. John, IN, to estimate potential additional supplies that could be developed from a dolomite aquifer and to estimate sustained yield from existing and new wells (1989).
- Assisted planning engineers in the design of a new water supply well for the DuPage County Department of

Public Works, IL. Performed field investigation and sampling to assess potential nearby contaminant sources, including a closed wastewater treatment plant and underground storage tanks (1988).

• Lead geologist for the Ak Chin groundwater study, AZ. Provided field supervision and analysis of exploration activities, including completion and testing of boreholes, 12-inch observation wells, and 26-inch production wells, which yielded up to 4,400 gpm from basin fill sediments during pumping tests (1982).

• Resident geologist during exploration drilling for groundwater in northern Haiti. Directed completion of 7-inch test wells in marine claystones and sandstones (1980).

• Provided field input to groundwater supply studies as part of the Copper Mountain Uranium Tailings Project, WY. Work included completion of a deep test hole using an air-driven downhole hammer and completion of the well in the Madison limestone aquifer (1979).

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• Project manager or lead hydrogeologist for numerous environmental site assessments and underground storage tank studies. Tasks have included data review; site inspections; interviews; sampling and analysis of soils, wastes, drums, tanks, and buildings; and preparation of reports. Selected clients have included

General Railroad Corporation;
Eli Lilly and Company;
AMOCO Oil Company;
Holland Motor Express;
Northern Indiana Public Service Company;
Commonwealth Edison;
Handschy Industries;
City of Park Ridge, IL;
Federal Asset Disposition Association;
Acme Corporation;
DuPage County (Illinois) Department of Public Works;
Baker & McKenzie; and
Boelter & Associates.

Several assignments included removal of underground storage tanks and contaminated soils.

Engineering Geology Projects

• With Harza Engineering Company completed numerous field and office assignments for planning, design, and construction of major civil works, including hydroelectric and water supply dams, pumped-storage hydroelectric projects, tunnels and shafts, and foundations. Selected projects include

Colorado Front Range Study, CO (1984);
Two Forks Dam, CO (1983);
Two Forks Alternative Sites, CO (1982);
Pehuenche Hydroelectric Project, Chile (1981-82);
Uribante Dam, Venezuela (1980);
Tunnel and Reservoir Plan, Chicago, IL (1980);
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Guri Hydroelectric Project, Venezuela (1976);
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Montezuma Pumped-Storage Project, AZ (1975);
Northern Illinois UPHS Project, IL (1975);
Lock and Dam No. 1 Restoration, MN (1974); and
Stony Creek Pumped-Storage Project, PA (1971-72).

TECHNICAL ARTICLES

"Groundwater Monitoring for Remedial Investigations in the Oriskany-Whitestown Sand Plains, Oneida County, New York," Sixth National Outdoor Action Conference, NGWA, Las Vegas, NV, 1992, in preparation (R.P. Kewer and E. Birckhead).

"The Importance of Geologic Observation in Environmental Site Assessments: A Case Study," *The National Environmental Journal*, vol.1, no. 2, 1991 (R.P. Kewer and S. Anderson).

"Use of Water Pressure Testing to Estimate Potential Groundwater Inflows for Expansion of a Dolomite Quarry in North-Central Illinois," Geological Society of America, North-Central Section, 1991; abstracts with programs, Toledo, OH, 1991 (R.P. Kewer, A. Shapiro, A. Curley, D. Barcen, and D. Walker).

William P. Rogers and Robert M. Kirkham, editors, "Regional Fault Study, Central Front Range, and Tectonics-A 1986 Update," Col. Geol. Survey Special Publication 28, 1986 (P.A. Dickson, R.P. Kewer, and J.E. Wright).

ROBERT P. KEWER

Senior Associate, and Head-Geology/Hydrogeology Section

Site work has included drilling and well installation, aquifer tests, geophysics, sampling and analysis, flow and transport modeling, installation of recovery wells, bench-scale testing of *in situ* bioreclamation, and evaluation of other remedial technologies for sitewide corrective measures.

Provided assistance in facility RCRA permitting; consulted on underground process storage tank leaks; prepared quarterly groundwater monitoring reports; and assisted in negotiations with IDEM and U.S. EPA (1984 to present).

- Project manager for RI/FS at the Behn Drum SRAPL site, IL. Work includes installation of monitoring wells; sampling of soils, sediment, surface water, and groundwater; and Risk Assessment (1991-92).
- Project manager for investigation of soil and groundwater contamination at a planned substation in Illinois. Work included six monitoring wells and sampling of soil and groundwater (1991).
- Directed environmental investigations at an equipment manufacturing plant in DeKalb, IL. Work included soil borings, monitoring wells, and sampling to characterize organic and metals contamination. Preliminary cost estimates were developed for a possible interceptor trench system (1990).
- Project manager for soil investigation of above-ground fuel storage facility, Vigo County, IN. About 12,000 yd^3 of fuel-oil-contaminated soils were known to be present, and additional contamination from off site was possible. Six monitoring wells were installed to identify groundwater flow patterns. Soil and groundwater samples were collected to identify contamination elsewhere. Site and area data were compiled for submission to IDEM. On-site soil treatment technologies were examined and preliminary cost estimates prepared (1990).
- Site manager for remedial investigation of the refinery products site in Schiller Park, IL, conducted by Illinois Environmental Protection Agency. Study addressed the presence and extent of subsurface soil and groundwater contamination using drilling and sampling of borings and monitoring wells and collection of soil and groundwater samples for analyses (1989).
- Whitestown Landfill RI/FS, NY: Participated in development of RI work plans, potential remedial technologies report, and a solid waste management plan. Directed and reviewed results of multimedia field investigations, including ambient air and soil gas surveys, test pits, drilling and monitoring well installations, sampling, and analysis. Prepared Phase I of the RI report (1988-89).
- Lead hydrogeologist for investigation and monitoring of the Arlington Heights Landfill, IL. This closed landfill was being used for placement of clay soils generated during excavation of a water retention lake. Prior to clay placement, site investigations defined site soil and groundwater conditions, identified the presence of landfill gas, installed a site groundwater monitoring system, and assessed possible contamination in adjacent underground utilities (1988).
- Lead hydrogeologist for remedial investigations at the Elemendorf Air Force Base, Anchorage, AK. Participated in planning and directing drilling and installation of groundwater monitoring wells on an on-base landfill, underground fuel storage tanks, and a burn pit. Sampling included soils, groundwater, drums, tanks, and wastes (1988).
- Office analyst of PBB contamination of glacial aquifers from the Gratiot County Landfill, MI: Study resulted in recommendations for remedial treatment that were performed by the Michigan Department of Natural Resources (1978).
- Project manager for a hydrogeologic study of potential groundwater contamination from fly-ash disposal at the Lincoln Stone Quarry, IL. Study resulted in licensing of the facility as a disposal site (1976).
- Resident geologist during a study to evaluate contamination of alluvial aquifers from a chemical plant in Kentucky. Study resulted in recommendations for remedial treatment and aquifer protection and for upgrading water supply from shallow wells (1975).

Groundwater Resource/Flow Projects

- Participated in preparation of a study plan for development of groundwater supplies needed for construction of the Yucca Mountain High Level Radioactive Waste Facility, NV. Participated in technical review of study plans authored by others in the areas of saturated and unsaturated zone flow (1990 to present).
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William P. Rogers and Robert M. Kirkham, editors, "Regional Fault Study, Central Front Range, and Tectonics-A, 1986 Update," Col. Geol. Survey Special Publication 28, 1986 (P.A. Dickson, R.P. Kewer, and J.E. Wright).

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	
PETITION OF COMMONWEALTH EDISON	)	R. 94-30
COMPANY FOR SITE-SPECIFIC	)	(SITE-SPECIFIC
REGULATION FOR EXISTING LANDFILLS	)	RULEMAKING)
AND UNITS:	)	
35 ILL. ADMIN. CODE 811.814	)	

PREFILED TESTIMONY OF DAVID P. RUBNER

1. **Q. Please state your name and business address:**

A. My name is David Paul Rubner. My business address is ComEd, Environmental Service Department, One First National Plaza, 10 South Dearborn Street, 35th Floor, Chicago, Illinois 60603.

2. **Q. By whom are you employed and what is your title?**

A. I am employed by ComEd as a Senior Engineer / Group Leader Land Quality Section. This position involves giving direct guidance to ComEd's Environmental Services Department Land Quality Group members and Generating Station, Regional Facility, General Office Department, Consultant, and Contractor personnel in all aspects of hazardous waste management regulation under the Resource Conservation and Recovery Act ("RCRA") and the Toxic Substances Control Act ("TSCA"). This includes guidance in interpreting, writing and implementing regulatory procedures; oversight of solid and hazardous waste (including polychlorinated biphenyls) permits, manifests, recordkeeping, and reports under RCRA and TSCA; oversight of remediation activity; and overall compliance with applicable environmental regulations. This position also involves oversight of some environmental litigation, technical / regulatory activity for geohydrological study, and permitting for the Joliet/Lincoln Quarry Ash Disposal Site.

3. **Q. Please describe your educational background and experience.**

A. I have received a B.S. in Geology from St. Joseph's College in Renesslear, Indiana and an M.S. in Geology from Northern Illinois

University. My work experience includes active participation in the Electric Utility Coal Ash By-Product Landfills Group. For the past 14 years, I have been active in the Joliet/Lincoln Quarry regulatory effort

4. Q. **What is the purpose of your testimony?**

A. My testimony is submitted in support of the petition of Commonwealth Edison Company ("ComEd") to designate the Joliet/Lincoln Quarry Site as a surface impoundment. The purpose of my testimony is to describe ComEd's historical and current operations at the Joliet/Lincoln Quarry Site (the "Site"), particularly as they relate to ComEd's use of the Main Quarry as a surface impoundment.

5. Q. **Please describe the location and layout of ComEd's operations at the Site.**

A. The Site lies entirely to the west of Brandon Road and to the north and south of Patterson Road, about ¼ mile south of the Des Plaines River, in unincorporated Will County. The Site occupies about 100 acres. The Site comprises three man-made units: the Main Quarry ("Quarry" or "Main Quarry"), the North Quarry, and the West Filled Area.

The Main Quarry is directly bounded by Patterson Road and the North Quarry to the north; Brandon Road and the abandoned, water-filled Boyd's Quarry to the east; ComEd's transmission line right-of-way and farmland to the south; and the West Filled Area to the west. Residential areas lie both to the northeast and southeast of the Site. The smaller North Quarry is bounded directly to north by an Illinois Central Railroad Company rail spur and an access road that serves Joliet Station 9; to the east by Brandon Road; to the south by Patterson Road and the Main Quarry; and to the west by Joliet Station 9. Further north of the access road is a Santa Fe Railroad right-of-way and the Des Plaines River. Finally, the West Filled Area consists of approximately 14 acres of unlined dolomite quarry located to the west of the Main Quarry.

6. Q. **How was the Site, and particularly the Main Quarry, created?**

A. The Site was created during the 1960s and 70s through quarrying operations undertaken by the Lincoln Stone Company. These quarrying operations removed all natural soils, unconsolidated materials, and the

underlying dolomite stone from the Main Quarry to a depth of approximately 100 feet, at an elevation of 475 feet above sea level.

Q. Please give a brief history of ComEd's use of the Site.

ComEd either owns, or leases pursuant to a long-term renewable lease, all of the property that makes up the Site. ComEd first acquired an interest in the Site in the 1960s, when it leased the 14 acre West Filled Area to dispose of combustion by-products -- flyash, bottom ash and slag -- generated at two coal-fired generating stations, Joliet Stations 9 and 29. Utilizing water withdrawn from the Des Plaines River, ComEd sluiced the combustion byproducts from these facilities through pipelines to the West Filled Area. The ash settled to the bottom of the Area and the sluice water drained, through a pipe in the center of the ash, into a settling pond in the Main Quarry, where it combined with groundwater that flowed into the Quarry through cracks in the dolomite. The sluice water and groundwater mixture was pumped to the Des Plaines River as part of the quarrying operations to prevent groundwater flow from flooding the Main Quarry.

Concurrently with ComEd's disposal activities, the Lincoln Stone Company continued its quarrying and stone processing operations in the Main and North Quarries, respectively. During quarrying operations, the Lincoln Stone Company created a gap in the north rock wall of the Main Quarry to connect the Main Quarry to the North Quarry. This gap was used to provide access between quarrying activities in the Main Quarry and stone processing equipment in the North Quarry. To separate the ash disposal operations from quarrying activities, ComEd constructed an ash berm along the east edge of what is now the West Filled Area.

When quarrying operations ceased in 1975, ComEd contracted with the Lincoln Stone Company to use the Main Quarry for ash disposal. The processing equipment and most processing structures were removed from the North Quarry when quarrying operations ceased. To facilitate disposal of ash in the Main Quarry, ComEd filled the gap in the north rock wall with clean fill to form a dike that would retain sluice water from wet disposal operations.

ComEd discontinued its disposal operations in, and appropriately covered, the West Filled area pursuant to Illinois Environmental Protection Agency ("IEPA") supplemental permit No. 1932-91. That permit required ComEd to level the West Filled Area on the north, south,

underlying dolomite stone from the Main Quarry to a depth of approximately 100 feet, at an elevation of 475 feet above sea level.

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ComEd discontinued its disposal operations in, and appropriately covered, the West Filled area pursuant to Illinois Environmental Protection Agency ("IEPA") supplemental permit No. 1932-91. That permit required ComEd to level the West Filled Area on the north, south,

and west sides; to cover the Area with at least two feet of soil; to grade the Area to drain; and to vegetate the Area with Illinois prairie grass. The vegetative cover effectively has controlled erosion of the topsoil over the West Filled Area. The eastern-most face of the ash berm between the Area and the Main Quarry remains uncovered.

8. Q. **Please describe ComEd's current operations at the Site.**

A. From 1975 to the present, ComEd has operated the Main Quarry as a surface impoundment to contain combustion byproducts from the burning of coal at the Joliet Stations. After conducting hydrogeologic investigations, ComEd was requested to apply for and was issued development permit No. 1976-37-DE and operating permit No. 1976-37-OP, which allowed disposal of coal combustion wastes in the Main Quarry. In 1982, IEPA issued supplemental permit No. 1982-91 to ComEd. Taken together, these permits allow ComEd to dispose of bottom ash and slag from Stations 9 and 29 in the Main Quarry. ComEd sends flyash[1] from both Stations directly to reuse markets or to appropriate commercial recycling and/or disposal facilities.

ComEd currently uses 43 acres of the Quarry as the active disposal site to accept only sluice water containing ash waste from ComEd's Joliet Stations 9 and 29. As one of several large fossil-fuel plants on ComEd's system, Station 29 generates about 95 percent of the bottom ash and slag that is deposited in the Main Quarry. Station 9 contributes the other 5 percent. The bottom ash and slag generated at Stations 9 and 29 collect at the bottom of ComEd's coal-fired boilers, where they are mixed with sluice water from the Des Plaines River. The ash-laden sluice water then flows into the Main Quarry through two parallel pipelines running from the generating stations to the Quarry's south rim. Approximately 8 million gallons per day of sluice water transport between 33 and 55 tons per day of ash and slag. This is roughly equivalent to three or four truckloads per day of dry ash and slag.

On average, sluice water remains in the Main Quarry for approximately 46 days, during which time most of the bottom ash and slag settle out. As

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[1] Flyash, which is the coal combustion byproduct that is discharged into ComEd's powerplant stack, collects in electrostatic precipitators. ComEd removes the ash from those precipitators and sends it offsite for reuse or appropriate disposal.

the ash and slag sink to the Quarry floor, supernatant water from the Main Quarry (including sluice water, groundwater inflow, and natural precipitation) flows by force of gravity through a series of valved discharge pipes into the North Quarry settling pond. The valved pipes run through the dike in the north wall of the Main Quarry. Approximately 8.6 million gallons per day of water flow, under the effects of gravity, into a roughly 2 million gallon settling pond in the North Quarry, maintaining the water level in the Main Quarry at between 549 and 555 feet above sea level. The North Quarry acts as a polishing pond for the water from the Main Quarry. From the polishing pond, water is pumped back to the Des Plaines River pursuant to ComEd's NPDES permit No. IL0002216 for outfall 005.

Approximately once every two to five years, ComEd also transports by truck and end-dumps relatively small amounts of bottom ash and slag from station 29 over the east wall of the Quarry. This material is removed from two small surface impoundments located on the north side of the Des Plaines River. When the sluice lines from Station 29 to the Main Quarry are shut down for routine maintenance or repair, these surface impoundments serve as temporary alternate receptacles for slag and bottom ash from the Station. Water used to sluice the ash and slag to these impoundments is recycled through the water treatment facility at the Station. When the level of ash and slag in these impoundments exceeds the maximum allowable level for proper settling, ComEd hires a contractor to remove and transport the ash by truck to the Main Quarry.

Q. **You have stated that the Main Quarry operates as a surface impoundment. Please explain how you reached this conclusion.**

A. I understand that Illinois regulations define a "surface impoundment" as any "natural topographic depression, a man-made excavation, or a diked area into which flowing wastes, such as liquid wastes or wastes containing free liquids, are placed." As I have described above, the Quarry is a man-made excavation, having been created by the mining activities of the Lincoln Stone Company in the 1960s and 1970s. ComEd's deposition of bottom ash and slag into the Quarry has been achieved almost solely by mixing these materials with water from the Des Plaines River and pumping them into the Main Quarry by pipeline. This appears to constitute deposition of wastes containing free liquids. I submit that ComEd's operations at the Main Quarry are exactly of the type described by the definition of "surface impoundment."

Additionally, the Site, including the Main Quarry, is operated in accordance with an NPDES permit, as surface impoundments are required to do. The sluice water used to move the ash and slag from the Joliet Stations to the Main Quarry flows into the North Quarry settling pond and from there is pumped into the Des Plaines River pursuant to NPDES permit No. IL0002216.

Finally, my belief that the Main Quarry is used as a surface impoundment, rather than as a landfill, is supported by the fact that it is used for the same purpose and in the same manner as surface impoundments are commonly used in the utility industry.

Q. **Does this conclude your testimony?**

A: Yes.

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10. Q. Does this conclude your testimony?

A: Yes.

CERTIFICATE OF SERVICE

I, Alan P. Bielawski, an attorney, certify that I have caused copies of the following:

1. PREFILED TESTIMONY OF FARRUKH M. MAZHAR AND ROBERT P. KEWER OF HARZA ENGINEERING COMPANY AND DAVID P. RUBNER OF COMMONWEALTH EDISON COMPANY, including Notices of Filing;

2. EXHIBITS FOR THE PREFILED TESTIMONY; and

3. CERTIFICATE OF SERVICE;

to be served upon the persons listed below by the method indicated on this 20th day of June, 1995:

Via Federal Express

Judith S. Dyer
Illinois Environmental Protection Agency
2200 Churchill Road
P.O. Box 19276
Springfield, Illinois 62794

Via U.S. Mail

Matthew Dunn, Chief
Environmental Control Division
Office of the Attorney General
State of Illinois
James R Thompson Center, 12th Floor
100 West Randolph Street
Chicago, Illinois 60601

John Moore
Director
Energy and Natural Resources Department
325 W. Adams
Springfield, Illinois 62704-1892

Alan P. Bielawski