Site Review And Update

N.L. INDUSTRIES INC.

PEDRICKTOWN, SALEM COUNTY, NEW JERSEY

CERCLIS NO. NJD061843249

SEPTEMBER 8, 1994

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation
Atlanta, Georgia 30333

Site Review and Update: A Note of Explanation

The purpose of the Site Review and Update is to discuss the current status of a hazardous waste site and to identify future ATSDR activities planned for the site. The SRU is generally reserved to update activities for those sites for which public health assessments have been previously prepared (it is not intended to be an addendum to a public health assessment). The SRU, in conjunction with the ATSDR Site Ranking Scheme, will be used to determine relative priorities for future ATSDR public health actions.

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Prepared by:

New Jersey Department of Health
Under Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry

SUMMARY OF BACKGROUND AND HISTORY

The NL Industries, Inc. (NLI) site is located at Pennsgrove-Pedricktown Road, in Pedricktown, Oldmans Township, Salem County, New Jersey. The NLI site, approximately 44 acres in size, consists of a closed landfill and a secondary lead smelting facility which, until 1981, recovered lead from spent automotive batteries. The site is bisected by a railroad. Approximately 16 acres are located north of the railroad tracks, including a closed 6 acre landfill. The southern 28 acres contain the abandoned secondary lead smelting facility and landfill access road (Figure 1). NLI maintains the landfill area and operates the landfill's leachate collection system.

The West and East Streams, border and receive surface discharges from the site. The site is part of an area that is zoned for development as an industrial park. The industrial park area is bordered by a combination of open, residential and agricultural lands. The nearest residence is less than 1000 feet from the site.

In 1972, NLI began the operation of recycling lead from spent automotive batteries. The plastic and rubber waste materials resulting from the operation were disposed off in the on-site landfill, along with slag from the smelting process (Figure 1-2).

In 1975, the Salem County Department of Health sampled 15 private drinking water wells in the site vicinity. One well was found to have an elevated lead levels. Several months later, private homes were connected to the public water supply.

During 1973 to 1980, the New Jersey Department of Environmental Protection and Energy (NJDEPE) cited NLI with several violations of the state air and water regulations. Water pollution violations were for the battery storage area and the on-site landfilling operations. The NJDEPE conducted an air monitoring in 1980 that identified lead, cadmium, antimony, and ferrous sulfate at levels exceeding the facility's operating permit.

NLI ceased smelting operations in May 1982. In October 1982, NLI signed an Administrative Consent Order (ACO) with NJDEPE to conduct a remedial program affecting the site soils, surface water runoff, landfill, and groundwater. The site was placed on the National Priorities List (NPL) in December 1982. In February 1983, the plant was sold to National Smelting of New Jersey (NSNJ) and smelting operations recommenced. NSNJ ceased operation in January 1984. In 1986, NLI signed a Consent Order with USEPA to conduct a site-wide Remedial Investigation and Feasibility Study (RI/FS).

Sampling of private wells by NJDEPE in the vicinity of NLI in 1986 and 1987 showed no site related contamination. In July 1989, USEPA sampled private potable wells located along U.S. Route 130, just north of the site, with the closest one being approximately 1000 feet from the landfill. The samples were analyzed for heavy metals contaminants. These wells exhibited no site related contamination.

Remedial History

USEPA conducted a multi-phased Removal Action at the site to address conditions that presented a risk to public health and the environment. In March 1989, the USEPA conducted Phase I of the Removal Action which consisted of chain-link fence to enclose the former smelting plant and encapsulation of the on-site slag piles to prevent contaminant migration.

In November 1989, USEPA began Phase II of the Removal Action. This phase consisted of additional encapsulation of the slag piles.

During February and March of 1991, the slag piles, lead oxide pile and surface water at the site's former smelting facility were sampled.

During March of 1991, USEPA performed Phase III of its removal activities at the site. During this phase, the damages to the perimeter fence were repaired and a new entrance gate was installed. Phase V of the Removal Action, which began in the fall of 1993, is expected to be completed during the summer of 1994. This phase of the Removal Action involves the removal of the contaminated stream sediments from the West Stream. Excavated material will likely be disposed of off site.

Recognizing the size and complexity of the site, USEPA is addressing its remediation in phases, or operable units. USEPA addressed Operable Unit Two on an expedited basis through a Record of Decision, dated September 1991. The Early Remedial Action for Operable Unit Two began in November 1992 and was implemented concurrently with the site-wide RI/FS for Operable Unit One. Operable Unit Two addressed the slag and lead oxide piles, contaminated surfaces and debris, and contaminated standing water, which were found to be significant and continual sources of contaminant migration from the site. The Operable Unit Two remediation is nearly complete.

A site-wide RI/FS, which USEPA has designated as Operable Unit One was conducted to determine the nature and extent of contamination on the site and areas adjacent to the site in various environmental media such as air, soils, groundwater, surface water and stream sediments. Elevated concentrations of metals were found in soils, including lead detected up to 12,700 ppm in soils on-site. Although several other metals were detected in site soils, lead is the primary contaminant of concern. Concentrations of lead in the west stream were measured as high as 206 ppb. NJDEPE initiated an air monitoring program in 1977 to assess off-site impacts, at which time elevated levels of several airborne contaminants, including lead, were detected.

Three hydrogeologic units consisting of unconfined aquifer, first confined aquifer, and second confined aquifer underlies the NLI site. A contaminant plume has been detected in the unconfined aquifer below the site. The plume is comprised primarily of lead ranging in concentrations from 3,130 ppb to 4,400 ppb. The other metals detected were cadmium, arsenic, copper, nickel, and zinc in lower concentrations. The first confined aquifer has not been

significantly impacted by contamination in the unconfined aquifer. Lead levels ranged from 1 to 3 ppb. A Record of Decision addressing the remediation of the following environmental media : soils; groundwater; surface water; and stream sediments was signed on February 23, 1994.

Potable Well Investigation

Private potable wells in the vicinity of the NLI site have been periodically sampled for site related contamination by various agencies: Salem County DOH in 1975 (one well with lead, public water made available), NJDEPE in 1986 and 1987 (no contamination), USEPA in 1989 (no contamination), 1991, and 1992.

On September 19, 1991, USEPA sampled water from seven residential taps in the vicinity of the NLI and analyzed for the inorganic compounds. Barium was detected in one of the seven samples at a concentration of 224 ppb (below the USEPA's MCL of 1000 ppb). Cadmium was detected in three samples, two of which had concentrations above the USEPA's MCL of 10 ppb. These concentrations were 16, 8, and 13 ppb, respectively. Only two samples contained lead, both of which were below the action level of 15 ppb. These concentrations were 4 and 9 ppb.

On August 25, 1992, USEPA resampled at three locations which showed contamination with cadmium during previous sampling of September 19, 1991. Cadmium was not detected in any of the samples (detection limit of 5 ppb). Wells previously exhibiting lead contamination in 1991 were not resampled in 1992. Table 1 (see Current Issues subsection) presents a summary of site related contamination detected in potable wells at the NLI site and calculated exposure doses.

Residential Soil Investigation

Approximately eleven to twelve residential soil samples have been tested and they were all below 500 ppm lead, which is USEPA's risk based clean up level. Most residential samples were below 300 ppm of lead.

ATSDR Activity

The Agency for Toxic Substances and Disease Registry (ATSDR) completed a preliminary health assessment for the site in April 1989. The preliminary health assessment noted that contaminated groundwater, surface water, and on-site soils were the identifiable potential human exposure pathways associated with the site. In addition, inhalation of contaminants entrained in air and possible ingestion of bioaccumulated contaminants in the food chain were another potential sources for human exposures. Contaminants of concern based on the on-site sampling indicated the presence of lead (36 to 83,600 ppm in soil, 7.5 ppm in surface water, and 0.01 to 11 ppm in groundwater). In addition, arsenic and cadmium were also detected in groundwater.

The 1989 health assessment did not identified any community health concerns.

The 1989 health assessment identified the following public health concerns:

1) Inhalation of site related contaminants entrained in air is a potential exposure pathway to the residents living near the site.

2) The residents using private potable well water have probably been exposed to site related contaminants in the groundwater.

3) Direct contact and incidental ingestion of contaminated soil and surface water by area residents is the most likely route of exposure.

4) There is a potential human exposure pathway to bioaccumulated contaminants in the food chain.

5) Elevated level of lead was detected during air monitoring conducted between 1979 to 1982. The lead smelting operation was on going during this period.

In summary, the ATSDR categorized the site in 1989 as a potential public health concern because of the risk to human health resulting from possible exposure to hazardous substances at concentrations that may result in adverse health effects.

Recommendations were made to conduct the following activities:

1) Obtain additional information on contaminants to further characterize the site and characterization of the hydrogeology of the area.

2) Additional information on potential environmental pathways through which the contaminants can reach the residents living near the site.

3) Additional information on the individuals living near the site should be obtained to facilitate in defining possible exposures to sensitive populations (e.g., children and elderly).

4) The food chain sampling results are required to evaluate the health effects of possible ingestion of bioaccumulated contaminants in the food (fish, livestock, and agricultural products).

CURRENT CONDITIONS OF SITE

On January 31, 1994, Narendra P. Singh of the New Jersey Department of Health (NJDOH) visited the NLI site accompanied by remedial project manager of the U.S. Environmental

Protection Agency (USEPA), and a representative of the Salem County Department of Health. The site visit included a formal presentation by the USEPA remedial project manager.

The following observations were made and information obtained during the site visit:

- The NLI site is an approximately 44 acre inactive secondary lead smelting facility including a closed landfill about 6 acre in size located north of the facility, is bordered to the west by a stream.

- An active remediation operation was on going at the site as specified in the ROD for Operable Unit 2. The structures on the site had been dismantled and the cleaning operation was ongoing.

- The site is fenced with an entrance gate and is posted with no trespassing and hazard signs. The site is accessible through Pennsgrove-Pedricktown Road. There was no evidence of any trespassing on the site. Conditions at the site have changed since the 1989 health assessment; that is, remediation of the site contaminants has begun.

- The closed landfill area of the site was fenced and is being maintained by NLI.

- On-site groundwater monitoring wells were observed.

- Although the site is fenced and warning signs are posted for the general public, at present workers involved in remedial operations have potential for exposure to the various physical hazards on the site including sharp metal objects and excavated area.

CURRENT ISSUES

Based on the site wide RI, site-related contamination is present in soils, surface water, sediments, and groundwater. The stream which is located west of the site is not used for fishing or any other recreational purposes (personal communication). Potential contamination of active residential wells remains a concern at the NLI site. Residential wells in the area have been monitored periodically for the presence of site related contaminants. Sampling of residential well water was done in September 1991 and the samples were analyzed for inorganic compounds. Lead was detected in two out of seven samples collected from residential tap water, both were below the USEPA's MCL of 50 ppb, which were in place at the time, and the current Action Level of 15 ug/L. In addition, an MCLG of 0 ppb has been established by EPA for lead in drinking water. The most recent residential well sampling was conducted on August 1992. Potable wells were not sampled for lead during this event.

Table 1 - Potable Well Contamination; National Lead Industries Site.

Compound	Frequency	Maximum Conc. 1991 Sample	Concentration 1992 Sample	EED mg/kg/day	MRL/RfD mg/kg/day
Barium	1/7	224 ppb	Not Sampled	.02 10kg .003 70kg	.07 (USEPA's RfD)
Cadmium	3/7	16 ppb	< 5 ppb	.0016 10kg .0002 70kg	.0007 (ATSDR's MRL)
Lead	2/7	9 ppb	Not Sampled	.0009 10kg	N/A

EED = Estimated exposure dose; 2 liters/day per 70 kg adult, 1 liter/day per 10 kg child.
MRL = Minimal Risk Level; chronic exposure.
N/A = Not Available

Currently, ingestion of contaminated groundwater remains a completed and potential human exposure pathway associated with the NLI site. The ATSDR/NJDOH had public health concerns regarding resident's past exposures to the contaminated private well water. The most recent residential well sampling results showed the presence of site related contaminants at levels which may constitute a public health concern.

Sample results of residential soils indicated the presence of lead contamination. The human exposure pathway of concern identified in the 1989 preliminary health assessment was the ingestion of contaminated soils (and dusts) by residents. For the purpose of calculating a potential exposure dose, it will be assumed that a 70 kg adult will ingest 50 mg/day of soil. The calculated exposure dose for the maximum (490 ppm) concentration present in residential soils were well below the No Observed Adverse Effect Level (NOAEL) for chronic exposure in animals, for effects other than cancer as cited in the ATSDR Toxicological Profile for lead. There is no current MRL for chronic oral exposure for the lead. An exposure dose for children may be calculated (based upon the maximum concentration of lead detected in residential soils) with the assumption that a 16 kg child will ingest 200 mg of soil per day. The calculated exposure dose for the maximum (490 ppm) concentration present in residential soils were well below the No Observed Adverse Effect Level (NOAEL) for chronic exposure in animals, for effects other than cancer as cited in the ATSDR Toxicological Profile for lead.

Soil ingestion can occur by the inadvertent consumption of soil on hands or food items, or the ingestion of non-food items (pica). All children mouth or ingest non-food items to some extent. An exposure dose for children aged 1-3 years old may be calculated (based upon the maximum concentration of lead detected in residential soils) with the assumption that a child will ingest 5000 mg of soil two days per week for two years. The calculated exposure dose for the maximum (490 ppm) concentration present in residential soils were well below the No Observed Adverse Effect Level (NOAEL) for chronic exposure in animals, for effects other than cancer as cited in the ATSDR Toxicological Profile for lead.

NLI maintains the landfill area and its leachate collection system. The landfill operator and the New Jersey State Police continue to monitor the site. USEPA has posted signs indicating that the site is hazardous and entry to the property is restricted.

Data describing potential site related air contamination were compiled during 1977 to 1982 which showed elevated level of lead. The lead smelting operation was on going during this period. This has changed since the facility was closed in 1982. Air monitoring was conducted during dismantling and cleaning of NLI site. All of the results were below air level standards for lead. The concern identified in the 1989 health assessment regarding inhalation of site related contaminants entrained in air as a potential exposure pathway to the residents living near the site is no longer occurring.

The ATSDR/NJDOH have not identified any additional community health concerns associated with site related contaminants.

CONCLUSIONS

1. In the context of current site conditions, the conclusion that was made in the 1989 health assessment, regarding the site being of potential (indeterminate) public health concern remains valid.

2. Current data indicate that at least two potable wells may be experiencing site related lead contamination. The public health significance and need to resample for lead contamination in private wells was evaluated. The MCLG for lead in drinking water necessitates a reevaluation of lead contamination in private wells at the site. Calculated exposure doses for lead are below the No Observed Adverse Effect level (NOAEL) for non-cacarcinogenic effects cited in the ATSDR Toxicological Profile for Lead.

3. Calculated exposure doses for 10 kg child for cadmium (16 ppb) exceed the USEPA's RfD and ATSDR's MRL. Calculated exposure doses for a 70 kg adult approached the USEPA's RfD and ATSDR's MRL. Calculated exposure doses for cadmium are below the No Observed Adverse Effect level (NOAEL) for chronic exposure in animals, for effects other than cancer as cited in the ATSDR Toxicological Profile for Cadmium.

4. The recommendation from the 1989 ATSDR health assessment calling for periodic monitoring of contaminant levels in the residential well water remains valid in context of current site conditions.

5. On the basis of the information reviewed, ATSDR and the NJDOH have concluded that NLI site in its present state poses an indeterminate public health hazard. Additional data are required detailing the number and quality of all residential wells currently in use which are potentially impacted by the site.

6. In the past, residents raised concerns regarding exposure to contaminated residential well water. These community concerns have been partially alleviated by the availability of public water. However, potable wells in the area of the site may still be impacted by metals contamination.

7. Maximum concentration of lead detected by NJDEPE in residential areas adjacent to the NLI site presented potential exposure doses for childrens and adults, that were below levels where adverse health effects would be likely. It should be noted that exposure dose calculations were based upon the maximum reported concentration of lead in residential soils, and thus represent a worst case exposure scenario. Data describing potential site related air contamination were compiled during 1977 to 1982--these data showed elevated level of lead in ambient air. The inhalation of site related contaminants entrained in air, ingestion of lead contaminated water from private wells, and the ingestion of soil contaminated with lead could have exposed the residents living near the site to a higher dose of lead than calculated for soil ingestion pathway alone.

RECOMMENDATIONS

1. Remedial activities at the NLI site should incorporate a private well census and sampling for site related contaminants. The public health significance of data should be evaluated under current criteria.

2. Those residents whose potable well water has been contamination in past or future sampling events should receive health education identifying the potential health risk associated with continued use.

3. New environmental, toxicological, health outcome data, or changes in conditions as a result of implementing the proposed remedial plan, may determine the need for additional actions at NLI site.

RECOMMENDATIONS OF THE HEALTH ACTIVITIES RECOMMENDATIONS PANEL (HARP)

The data and information developed in the Site Review and Update for the site, NL Industries, Inc., Pedricktown, Salem County, New Jersey has been evaluated by ATSDR's Health Activities Recommendation Panel (HARP) for appropriate follow-up with respect to health activities. The panel determined that community health education and health professions education are indicated. The NJDOH, in conjunction with the county health department, will conduct community health education. The NJDOH will conduct health professions education.

PUBLIC HEALTH ACTION PLAN

The purpose of the public health action plan (PHAP) is to ensure that this Site Review and update not only identifies public health hazards but also provides a plan of action designed to mitigate and prevent adverse human health effects resulting from exposure to hazardous substances in the environment.

Actions Planned:

The NJDOH will evaluate the results of future private well sampling as they become available.

The NJDOH, in conjunction with the local health department, will educate those persons whose private wells have been contaminated, during past or future sampling events, of the health risks associated with their exposure.

The NJDOH will conduct health professions education.

CERTIFICATION

The Site Review and Update for the N.L. Industries, Inc., site was prepared by the New Jersey Department of Health under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the site review and update was initiated.

Technical Project Officer, SPS, RPB, DHAC

The Division of Health Assessment and Consultation (DHAC), ATSDR, has reviewed this site review and update and concurs with its findings.

Director, DHAC, ATSDR

DOCUMENTS REVIEWED

1. Record of Decision (ROD) - Operable Unit 1, NL Industries, Inc. Site, Pedricktown, Salem County, New Jersey. USEPA. February 23, 1994.

2. Residential Tap Sampling Report, NL Industries, Inc. Site, Pedricktown, Salem County, New Jersey. USEPA. November 22, 1991.

3. Record of Decision (ROD) - Operable Unit 2 , NL Industries, Inc. Site, Pedricktown, Salem County, New Jersey. USEPA. September, 1991.

4. Draft Focused Feasibility Study (Operable Unit 2), NL Industries, Inc. Site, Pedricktown, Salem County, New Jersey. USEPA. June, 1991.

5. Health Assessment for the , NL Industries, Inc. Site, Pedricktown, Salem County, New Jersey. ATSDR. April 1989.

6. Remedial Investigation/Feasibility Study Workplan, NL Industries, Inc. Site, Pedricktown, Salem County, New Jersey. USEPA. May, 1987.

7. Agency for Toxic Substances and Disease Registry. Draft Toxicological Profile for Barium. Atlanta, ATSDR, March, 1989.

8. Agency for Toxic Substances and Disease Registry, Draft Toxicological Profile for Cadmium, Atlanta, ATSDR, 1989.

9. Agency for Toxic Substances and Disease Registry, Draft Toxicological Profile for Lead, Atlanta, ATSDR, 1990.

INTERVIEWS/PERSONAL COMMUNICATIONS:

1. Emergency & Remedial Response Division/USEPA:

   -Remedial Project Manager/Environmental Engineer

2. Salem County Department of Health:

   -Senior Sanitary Inspector

3. NL Industries, Inc./ Corporate Environmental Services:

   -Senior Environmental Engineer

PREPARER OF REPORT

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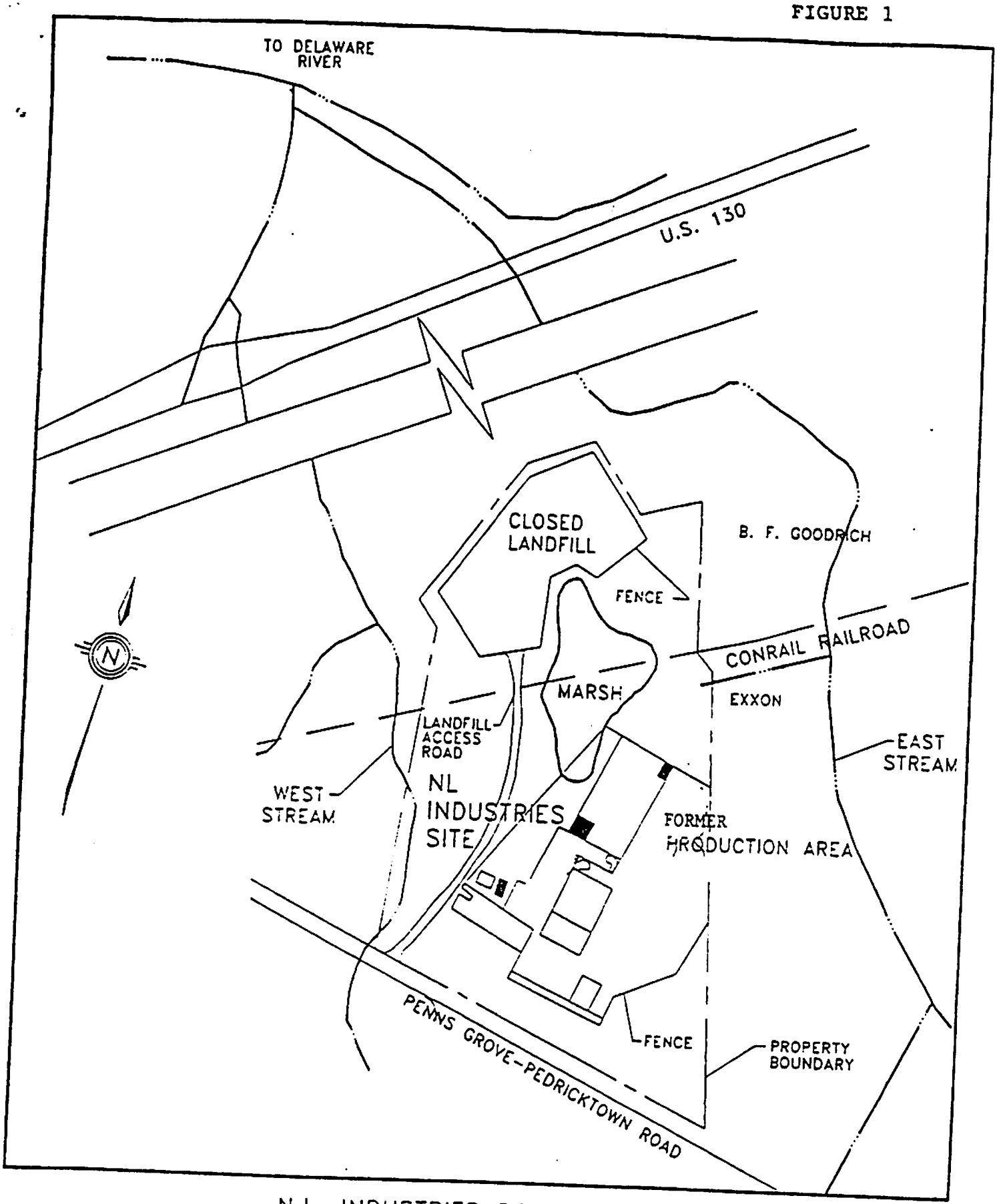
FIGURE 1



N.L. INDUSTRIES SITE LOCATION

NOT TO SCALE

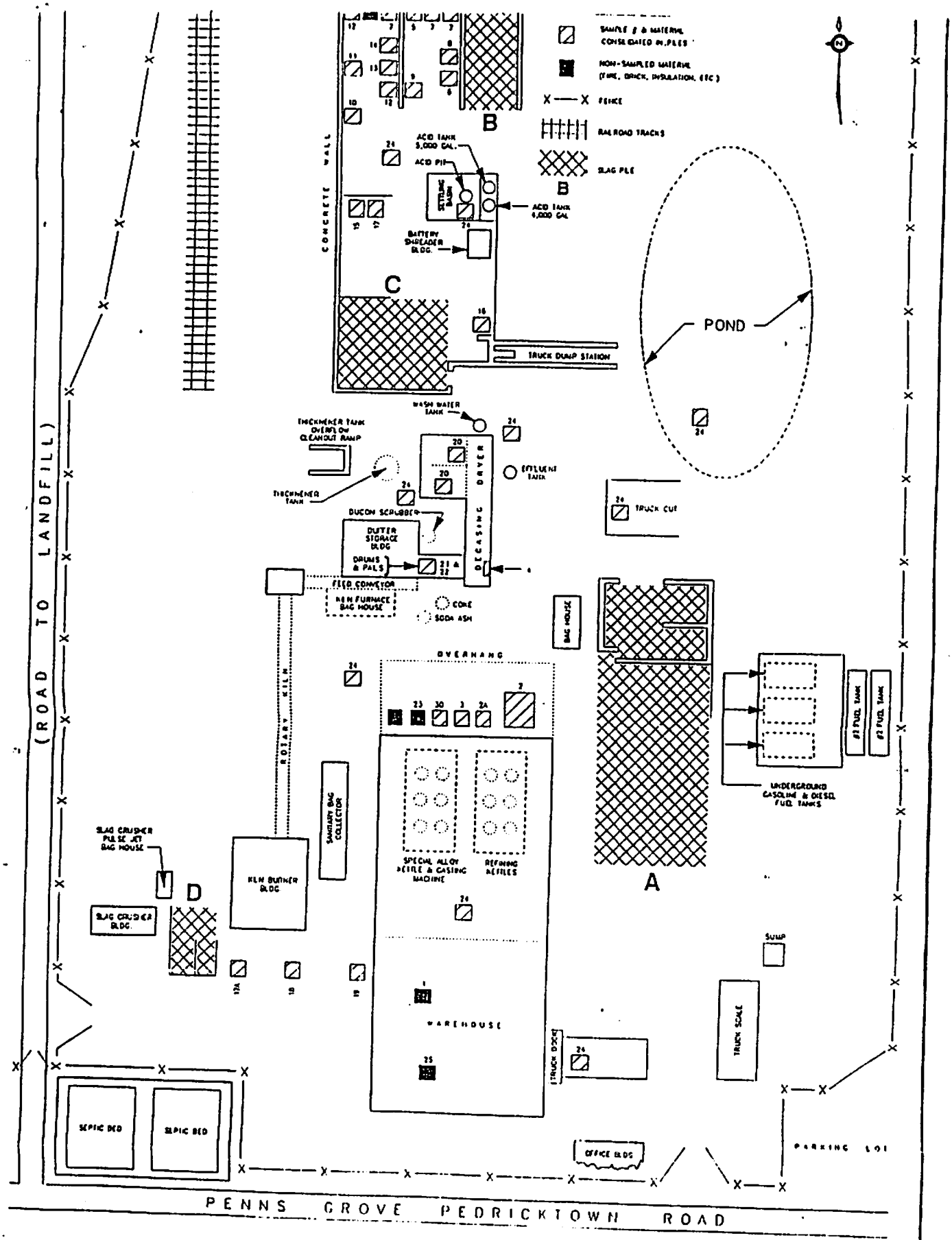


FIGURE 1-2

NL INDUSTRIES

PEDRICKTOWN, NEW JERSEY

DWN. NOT TO SCALE