DURACELL INC.

NORTH TARRYTOWN, NEW YORK

HAZARDOUS WASTE
STORAGE FACILITY
CLOSURE PLAN
ADDENDUM REPORT NO. 1

PROJECT #425-1

REVISED APRIL 1986

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April 11, 1986
File #425-1

Mr. James Reidy, P.E.
Regional Hazardous Waste Engineer
New York State Department of
Environmental Conservation
202 Mamaroneck Avenue
White Plains, New York 10601

Dear Mr. Reidy:

In accordance with our meeting of March 12, 1986, enclosed is the revised Hazardous Waste Storage Facility Addendum Report No. 1.

Please feel free to call if you have any questions.

Very truly yours,

EDER ASSOCIATES CONSULTING ENGINEERS, P.C.

Gary A. Rozmus
Vice President

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I. INTRODUCTION

The Hazardous Waste Storage Facility Closure Plan prepared for Duracell Inc., North Tarrytown, New York by Eder Associates Consulting Engineers, P.C. (Eder), October 1985, was submitted to the New York State Department of Environmental Conservation (DEC) on October 28, 1985. On November 19, 1985, Mr. James Reidy, P.E., DEC Regional Hazardous Waste Engineer, sent a letter to Duracell requesting information on how areas outside of the Hazardous Waste Management Facility would be shown to be free of hazardous waste residues. This report provides the additional information requested in Mr. Reidy's letter.

In addition to the Closure Plan, Eder had also submitted two other reports in response to the DEC's request for information under Article 27, Title 13 of the Environmental Conservation Law (ECL). These reports are titled "Engineering Report Evaluating On-site Residues" (On-Site Report) and "Engineering Report Evaluating Off-site Residues" (Off-Site Report). Much of the additional information requested regarding the Closure Plan is contained in these reports and is referenced and developed as appropriate. Data tables, figures and drawings from these reports which are referenced in this Addendum report are presented in Appendix C.

When the Resource Conservation and Recovery Act (RCRA) regulations became effective in 1980, Duracell was manufacturing lithium batteries at the North Tarrytown plant. This manufacturing activity generated regulated hazardous wastes. As part of its RCRA hazardous waste management program, Duracell constructed a hazardous waste storage facility, consisting of two storage rooms and a concrete pad, in the southeast yard area adjacent to the plant building.

In 1985, Duracell undertook an evaluation of the plant to identify feasible future uses including establishing alternative manufacturing operations, other corporate uses or divestiture of the property. In October, Duracell concluded that the hazardous waste storage facility would be closed, the building would be demolished and the land offered for sale.

To assist in the evaluation, Eder was retained to investigate plant conditions with respect to the potential presence of residues. The investigation is summarized in the On-Site Report.

Duracell proposes to clean the building so that traces of lead, mercury and zinc that may remain from materials handling and/or as fugitives from production activities are removed to the point where the demolition debris can be disposed of in a C&D landfill. Moreover, Duracell will remove on-site soils containing these metals in excess of the level determined to be appropriate to protect public health. After cleaning the building, Duracell proposes to close the hazardous waste storage facility in accordance with the Closure Plan. Duracell contends that the Closure Plan should be limited to the physical improvements related to the storage of hazardous wastes and nothing submitted to the DEC should be viewed as a waiver of that position.

Cleaning the plant and removing soils for the purposes intended would remove any theoretical residues resulting from the generation and handling of hazardous wastes outside the storage facility. There is therefore no necessity for the Closure Plan to address any areas in addition to the hazardous waste storage facility. Duracell believes that its Closure Plan combined with the on-site cleanup program constitutes a level of effort sufficient for federal and state regulatory purposes.

Eder intends to develop specifications for cleaning and closing the site after receiving the DEC's approval of the concepts as presented in the Facility Closure Plan, the On-Site Report, and this response to DEC's inquiry (Addendum #1 to the Plan). The specifications would be submitted to the DEC for review and approval prior to implementing the work.

Revised May 23, 1986

Disposal facilities for demolition debris and industrial and hazardous wastes generated during the site remediation will be selected at the time of contract award to the cleaning contractor. Sites available for the disposal of hazardous wastes include the Cecos International facility, Niagara Falls, New York; Chemical Waste Management of New York, Model City, New York and Chemical Waste Management of Indiana, Fort Wayne, Indiana. Some liquid wastes generated during the site remediation may be transported to a Treatment, Storage and Disposal (TSD) facility for treatment to separate contaminants. Residual sludge containing the separated contaminants would be disposed, depending upon its characteristics, either to the industrial or hazardous waste disposal facility. Some cleaning contractors have the capability of performing this treatment at their facility. Other contractors may subcontract the treatment to TSD facilities such as Envirite, Plymouth Meeting, Pennsylvania. The treatment could be also performed on-site and acceptable treated liquid could be discharged, with approval, to the sewer system.

1. "Process flow diagrams to identify the generation points of the hazardous wastes"

Since the mid 1970's, two types of batteries have been produced at the plant, i.e., Lithium-SO_2 and Lithium solid cell batteries. Figures 4 and 5 of the On-Site Report present process flow diagrams for the production of these cells. The generation of hazardous wastes is discussed in response to Item 3.

2. "Lay-out of the Sewer System Indicating but not limited to:

   a) Floor drains in process areas.

   b) Sewer lines conveying industrial wastewater, lab wastes, manholes, connection to City sewer system."

Drawing No. 2 of the On-Site Report presents a floor plan of the plant and shows the location of known drain pipes, floor drains, trenches and manholes. Three main drain pipe connections to the sanitary sewer are known to exist.

A branched floor trench, referred to as the East Floor Trench, runs parallel to the east wall and discharges through a drain pipe to the sanitary sewer at the north wall. Floor drains in Areas 4 and 5 and sinks (not shown) in Area 3 discharge to this floor trench. Presumably the lavoratories, in Rooms 9 and 10 of Area 1, also discharge to this drain pipe.

Two drain pipes discharge to the sanitary sewer through the west wall. One drain pipe in the northwest part of the plant serves floor drains in Area 8. Fixtures in Room 31 of Area 9 and lavoratories in Rooms 24 and 25 of Area 2 and Rooms 62 and 63 on the second floor are also presumed to discharge to this drain pipe. A drain pipe located in a floor pipe trench, referred to as the West Floor Trench, extends from the center of the plant to the west wall. This drain pipe presumably serves showers and lavoratories in Rooms 41A, 42 and 43 of Area 3 and possibly floor drains in Area 10 and the second floor cafeteria in Room 65. This pipe trench does not have a connection to the sanitary sewer. Wastewater was not intentionally discharged directly into this floor trench.

The interconnection of some floor drains, interior manholes and storm drains is not completely defined. For example, the interconnection of the manhole in Room 28 of Area 7 is not presently known. A manhole may exist in Corridor 27 outside Room 12 of Area 3. These and other interconnections will be exposed during building demolition.

Each building drainage system will be removed in sections, during the demolition following removal of the plant floor slab, and handled as a hazardous waste. Bedding materials around each system will be wetted, excavated and placed in separate on-site stock piles underlain and covered with plastic sheeting. Piping sections would then be lifted slightly to permit wrapping in a plastic bag and then removed either to the on-site cleaning area or transported to an off-site TSD facility for cleaning depending upon contractor capability and costs. On-site cleaning would be performed in Area 15, consisting of three rooms 52, 53 and 54 including the then closed Hazardous Waste Management Facility. This would be the last structure to be removed from the site. One room to be used for cleaning would be provided with a sill to contain wash water runoff. The other rooms would be used for storage of sections to be cleaned and those which had been cleaned. A representative number of cleaned sections will be wipe sampled to document the level of cleanliness achieved. Typically a composite sample of the first, middle and last section of each main drain removed will be taken and analyzed for lead, mercury and zinc areal concentrations. Cleaned sections will then be disposed to a construction and demolition (C&D) landfill. After cleaning of the piping is completed, the room used for cleaning will be decontaminated by power washing and wipe sampled to document the level of cleanliness achieved. All wash waters will be collected and transported to a TSD facility. Finally the rooms will be demolished and disposed to a C&D landfill. The criteria for cleanliness of piping and the room and acceptability for disposal to a C&D landfill will be the same as that developed in the test cleaning (refer to Item 7). If the piping sections are cleaned at a TSD facility, wipe sampling of cleaned sections will be similarly performed prior to disposal at a C&D landfill.

Representative samples of each bedding material stock pile will be taken using a tube sampler in the same manner as that described for bulk solids samplings in Item 10. These samples will be analyzed for lead, mercury and zinc content. If the content is less than the acceptable soil metal concentrations identified in the On-Site Report, it will be backfilled into the excavation. If the metal content exceeds the acceptable concentrations, EP toxicity testing for lead and mercury will be performed. Soil demonstrated to be non-hazardous will be disposed to an industrial waste landfill and those demonstrated to be hazardous will be handled and disposed of as a hazardous waste. An investigation of soil conditions surrounding the pipe bedding will be undertaken to identify the extent of elevated concentrations and develop a remediation program.

Plastic bags used to wrap piping sections will be handled and disposed of as a hazardous waste. Plastic sheeting used to contain stock piles will be handled in accordance with the results of the soil sample analysis.

The production of lithium batteries did not generate a wastewater discharge. Under the Westchester County Industrial Pretreatment Program investigation, Duracell was classified as a non-significant industrial user. The investigation had shown that only domestic wastewater and non-contact cooling water were discharged to the sanitary sewers. Documentation of this classification is presented in Appendix A.

There have been no reported spills of hazardous wastes inside the plant building and none are known. Although this report contemplates the theoretical possibility of spills, such considerations are only for the purposes of explaining the consequences of such theoretical spillage. If small unreported spills to the floor were to have occurred, only a small fraction of such spillage would have entered the building drainage systems. As discussed in response to Item 3, most of the hazardous wastes were either solid and non-flowable, would evaporate quickly if spilled and not wiped up or were generated in locations remote from drains. If hazardous wastes entered any drains, the materials would have been flushed to the sanitary sewers and diluted to undetectable levels. With the exception of oil, most of the hazardous wastes were readily soluble in water. The only residue of hazardous wastes generated by the production of lithium batteries which could be present in the drains is oil and possibly carbon.

Since there are no residues of RCRA regulated hazardous wastes remaining in the drains, decontamination of the drains, as part of the Closure Plan is not required. Cleaning of the drains will be performed to remove other potential residues so that the drains can be disposed to a C&D landfill.

3. "Description of how the hazardous waste generated during manufacturing operation was collected."

Nine types of hazardous wastes, identified in Table 1 of the Closure Plan, have been generated. Table 1 summarizes the relative quantities and characteristics of the wastes. About 26 percent of the total waste generated were reactive solids, 34 percent were flammable, 30 percent were toxic, 6 percent were corrosive and less than 4 percent were miscellaneous laboratory chemicals classified as either oxidizers, corrosive or poisonous liquids.

Lithium Batteries

Samples of product cells were electrically tested for compliance with performance specifications prior to battery assembly. Testing was performed in the center of Room 26 in Area 3. Product cells which did not conform to specifications were disposed of as hazardous wastes. The cells were transferred to the hazardous waste storage facility where they were packaged in cardboard containers with separators to prevent contact between cells. Internal spaces of the containers were filled with vermiculite to prevent movement and contact. The containers were placed in 55 gallon steel drums and internal spaces were also filled with vermiculite.

Lithium Metal

Small quantities of lithium metal fragments were rejected during production and disposed of as hazardous wastes. Since lithium reacts with water, the material must be handled under dry conditions without exposure to moisture. Most of the rejected lithium fragments originated from the anode cutting operation for Lithium - SO_2 cells performed in Room 44 of Area 11. This room has a humidity controlled environment, is isolated from other areas of the plant and does not have any connections to drains. Rejected lithium fragments were placed in steel drums filled with mineral oil.

DURACELL INCORPORATED

NORTH TARRYTOWN, NEW YORK

TABLE 1

HAZARDOUS WASTE GENERATION

Type	Percent of Total(1)	Hazardous Waste Number	Characteristic
Lithium Batteries	26	D003	Reactive
Lithium Metal	.1	D003	Reactive
Waste Alcohol	8.9	D001	Ignitable
Electrolyte	2.8	D001/D002	Ignitable/Corrosive
Solvent	17.3	D001	Ignitable
Freon	29.4	F002	Toxic
Alkaline Solution	5.1	D002	Corrosive
Oil	6.5	D001	Ignitable
Laboratory Wastes	3.8	--	---

Note:

(1) 1983 through August, 1985

Small amounts of rejected lithium fragments also orginated from the anode punching operation for lithium solid cells performed in glove boxes located in Areas 7 and 8. The rejected fragments were transferred in closed containers from the glove boxes to Room 44 for packing in the oil filled drums. The drums were sealed and transferred to the hazardous waste storage facility using a hand truck.

Waste Alcohol

In the production of cathodes for lithium - SO_2 cells, a paste consisting of carbon, propanol, water and teflon dispersant was applied to an aluminum screen. The impregnated screen was pressed between rollers (calendar) and dried. Alcohol and water pressed out by the calendar was collected in drip pans which drained into small safety containers. Periodically the container was hand carried to the hazardous waste storage facility and the contents were transferred to 55 gallon drums.

Paste was formulated in Area 4. This area has a floor drain connected to the East Floor Trench. The screen processing line, including the calendar, was located along the east wall of Area 3, about 35 feet from the East Floor Trench.

This waste is considered hazardous because of ignitability. Propanol evaporates quickly and is highly soluble in water. The paste is viscous and any spillage to the floor would not have readily flowed to floor drains. Residues remaining on equipment and any spillage to the floor would have evaporated leaving a residue of carbon. Cleaning of equipment was not normally required. Residues on paste formulation equipment were left in place. Vacuuming of the screen processing line was occasionally performed to remove carbon residues. If spillage entered the drainage system, the soluble waste would have been flushed to the sanitary sewer. Some carbon residues could remain in the drainage system.

Electrolyte

The electrolyte for lithium - SO_2 cells consisted of sulfur dioxide (SO_2) mixed in an organic solvent, acetonitrile, with an inorganic salt, lithium bromide. Electrolyte which did not conform to specifications was disposed of as hazardous waste.

The electrolyte was formulated in a closed system consisting of four interconnected glass cylinders which were located in Area 9. Acetonitrile was received in 55 gallon drums and stored in the concrete block addition along the west wall of the plant, Room 34. The acetonitrile was pumped by air pressure from the storage drums through valved piping into the cylinders. When the cylinders were filled, sealed glass containers with dry lithium bromide were attached to the top of the cylinders using a valved connection. The salt was transferred to the cylinders under vacuum. The valve was then closed and the empty container was removed. SO_2 from pressurized cylinders was then added to the cylinders through valved piping. The electrolyte was mixed by pumping between cylinders and a sample was withdrawn for analysis through a syringe connection. If acceptable, the electrolyte was pumped into a closed storage tank of about 40 gallons capacity. Cells were filled by pumping electrolyte from the tank through a manifold.

If electrolyte did not conform to specifications, the cylinders were vented to a ventilation system discharging through the scrubber. The cylinders were then drained into a plastic lined 55 gallon drum. Periodically the system was cleaned by flushing with acetonitrile which was also drained into the drums. The drums were sealed and transferred to the hazardous waste storage facility by hand trucks.

Acetonitrile waste is considered hazardous because it is ignitable. Acetonitrile and SO_2 evaporate quickly and are soluble in water. Lithium bromide is reactive and soluble in water. Acetonitrile remaining on equipment after cleaning would evaporate. If electrolyte were spilled to the floor and not wiped up, acetonitrile and SO_2 would evaporate leaving a residue of lithium bromide. Evaporated acetonitrile and SO_2 would be exhausted through the scrubber system. If any spillage entered the drains, the soluble electrolyte would have been flushed to the sanitary sewers.

Solvent

Lithium - SO_2 cells were washed by dipping in a tank containing a biodegradable detergent wash solution followed by a water spray rinse and dipping in solvent tanks to remove water carryover and in a freon tank to remove solvent carryover. This operation was performed along the west wall of Room 30, Area 8. The capacity of each dip tank was between 30 and 40 gallons. There are no floor drains near these tanks.

Solvent and freon were the only wastes from the washing operation. The detergent wash solution was discarded on rare occasions to the sanitary sewer since only minute amounts of contaminants were removed from the cells. Periodically, makeup detergent was added to the wash tank. Rinse water was recycled to the detergent wash tank.

The solvent was Stoddard Solvent also known as mineral spirits. Periodically, when the solvent tank became contaminated by water, it was discarded by pumping into drums. The sealed drums were transferred to the hazardous waste storage facility by hand truck.

This waste is considered hazardous because of ignitability. The solvent evaporates quickly. It has a specific gravity less than 1 and being insoluble in water would tend to float. Residual solvent remaining in the tank or spillage to the floor would evaporate if not wiped up. If any spillage entered the drains, the floating waste would have been flushed to the sanitary sewers.

Freon

Freon (Trichlorotrifluorethane) contaminated by water and solvent was reclaimed in a still. The contaminated solution was heated to evaporate freon which was condensed, collected and returned to the freon dip tank. The dip tank and still formed an enclosed system.

Periodically, the still bottoms were discarded by draining into drums which were sealed and transferred to the hazardous waste storage facility by hand truck.

This waste, consisting of freon contaminated by solvent and water, is considered hazardous because of toxicity. Freon evaporates quickly, has a specific gravity greater than 1, and is slightly soluble in water. Residues of this waste remaining on equipment or spillage to the floor would evaporate if not wiped up. If any spillage entered the drains, the soluble waste would have been flushed to the sanitary sewers. Any heavy freon accumulating on drain bottoms would eventually dissolve into the carrier liquid.

Alkaline Solution

The lithium-SO_2 electrolyte cell filling manifold, located in Area 9, was cleaned daily by dismantling the system and dipping the parts in small quart baths of dilute sodium hydroxide. Contaminants removed in cleaning include residual acetonitrile and salts. SO_2 remaining in the acetonitrile would be neutralized by the cleaning solution. The used cleaning solution was transferred into drums which were sealed and transported to the hazardous waste storage facility by hand truck.

This waste is considered hazardous because of corrosivity. Residual solution remaining on equipment or spillage to the floor would evaporate, if not wiped up, leaving a residue of sodium hydroxide, lithium bromide and possibly sodium sulfites. If spillage entered the drains, the soluble waste would have been flushed to the sanitary sewers. The alkaline waste would have been neutralized by the buffering capacity of domestic sewage.

Oil

Waste oil was generated by draining vacuum pumps and hydraulic equipment. The oil was drained into pans, the contents of which were transferred to drums. After sealing, the drums were transported to the hazardous waste storage facility by hand truck.

This waste is considered hazardous because of ignitability. Spillage to the floor would remain as an oily residue. If any spillage entered the drains, most of the oil would be flushed to the sanitary sewers, but some deposits may have formed. Residues and deposits would primarily create unsightly nuisances which could possibly clog drains or pose a safety hazard because of slippery surfaces.

Laboratory Wastes

Laboratory wastes have included the following types of chemicals:

Year	Chemical	Approximate Quantity
1982	phosphoric acid	360 gallons
1983	methylene chloride	55 gallons
	trichloroethane	55 gallons
1984	corrosive	600 lbs
	oxidizer	400 lbs
	poison	400 lbs
1985(1)	corrosive	1050 lbs
	oxidizer	800 lbs
	poison	600 lbs

(1) Through August

Some of these wastes were purchased chemicals which were never used and remained in their original shipping container. Other wastes were generated from a variety of test and experimental activities. When discarded, the chemical was transferred into a 55 gallon drum which was sealed and transported to the hazardous waste storage facility by hand truck. Small quantities of a variety of chemical wastes were generated during 1984 and 1985. The chemical containers were placed in lab paks, grouped according to compatibility and were placed in 55 gallon drums. The voids between paks were filled with vermiculite and the drums were sealed and transported to the hazardous waste storage facility by hand truck.

Because of the wide variety of chemicals used, no general statements can be made concerning the potential effects of spillage or residues. Since the volume of laboratory chemical wastes is small in comparison to other waste materials, the quantitative effect of potential spillage is small.

Summary of Handling Practices

There were no reported spills of these hazardous wastes during collection and handling inside the building and none are known. Theoretical unreported spills of most liquid wastes to the floor would, if not removed, have evaporated leaving negligible amounts of residue. With the exception of oil, these wastes have a significant vapor pressure. Residues which may remain on plant surfaces include primarily oil and carbon and possibly small amounts of lithium bromide, sodium hydroxide and sodium sulfites. Since there are no known residues of these RCRA regulated hazardous wastes remaining on the plant surfaces, decontamination of the building, as part of the Closure Plan, would not be required. Cleaning of the building will nevertheless be performed to remove other residues containing mercury and lead so that the debris resulting from demolition can be disposed to a C&D landfill.

One reported spill of waste alcohol at the Hazardous Waste Storage Facility occurred on May 31, 1984. Relevant documentation is presented in Appendix B. The waste alcohol had been stored on the facility concrete pad pending evaluation of an experimental reclaiming process to permit reuse as cathode paste for Lithium SO_2 cells. Employees of an outside contractor mistakenly emptied the drum contents onto the paved yard area.

As described in the internal memorandum of June 13, 1984, the spill flowed along the driveway beside the south property line into Andrews Land and finally into a storm drain on Beekman Avenue. Most of the spillage in the storm drains was removed and surface spillage was soaked up with sand which was removed and disposed of by Chemical Waste Management as a non-hazardous waste. A small amount of spillage remaining in the storm drain was washed out by subsequent precipitation runoff.

The waste alcohol consisted in a mixture of water, propanol, carbon and teflon dispersant and is considered hazardous because of ignitability. Propanol evaporates quickly and is highly soluble in water. The spillage had been soaked up with sand potentially leaving only a minute amount of residue on the driveway and street surfaces. Residual propanol would have evaporated or, together with carbon and teflon, would have been washed into the storm sewers by rainfall runoff where it should have been diluted to undetectable levels.

The spillage was contained on paved surfaces and none would have leached into the ground. The paved driveway has a curb along the south property line to retain runoff. Street curbs would have prevented overflow to unpaved areas.

The southeast yard area is paved with the exception of two small strips and the east side yard as shown in Figure 1. Soils in these areas will be removed under the on-site soil remediation plan. If any unreported spills at the Hazardous Waste Management Facility were to have occurred, the spill would probably have been minimal and would have occurred on the paved surfaces. If not removed, most of the spill would have evaporated leaving negligible amounts of residues or would have been removed by storm water runoff either to storm sewers or possibly unpaved areas. Under the most severe theoretical scenario, only negligible amounts of spillage would have been transported to unpaved areas. Since it is planned to remove soils in these areas, no potential residues will remain on-site.

4. "What is the inventory of hazardous waste that is being removed prior to cleaning operations?"

Production equipment, maintenance and experimental materials and finished lithium batteries remain in the plant. Duracell is currently in the process of reviewing this inventory to identify which items will be sold, used in their other facilities and which will be discarded. This review will also identify those items to be discarded as hazardous wastes. The quantity and characteristics of hazardous wastes cannot be precisely determined until the review is completed.

Among the materials remaining is an estimated 2,500 gallons of potassium hydroxide (KOH) in the storage tanks located in the southeast areaway. The results of sampling and analysis of this material is presented in Table 13 of the On-Site Report. The KOH has a pH of 13.8 and would be considered a hazardous waste because of corrosivity. Alternatives for disposal of this material include on-site treatment by pH adjustment and disposal to the sanitary sewer or hauling to an off-site treatment, storage and disposal (TSD) facility. RCRA regulations permit on-site elementary neutralization without a TSD permit (40 CFR 264 Subpart A). On-site treatment and disposal to the sanitary sewers requires approval from the Westchester County Department of Environmental Facilities and compliance with its discharge limitations.

Other materials remaining in the plant include 30,000 lithium batteries and about 300 gallons of miscellaneous laboratory and maintenance chemicals including two drums of boiler water treatment chemicals. The inventory review will identify which of these materials will be discarded as hazardous wastes. It is anticipated that not more than 15 drums of hazardous wastes will be generated.

The present inventory of materials stored in the hazardous waste storage facility include one drum each of waste alcohol and electrolyte, and four drums of unknown material. The contents of these drums are presently being identified.

The hazardous waste storage facility has a maximum capacity of 50 drums. The quantity of hazardous wastes to be generated will not exceed this storage capacity.

5a) "What equipment was used or came in contact with hazardous wastes and how will that equipment be decontaminated?

b) List what equipment that was used in handling hazardous waste which has already been shipped off the site."

Manufacturing equipment which generated hazardous wastes include:

Waste	Generating Equipment
lithium batteries	none
lithium metal	anode cutters and punches
waste alcohol	blender and calendar
lithium-SO_2 electrolyte	mixing cylinders and cell filling system
solvent	solvent tank
freon	dip tank and still
alkaline solution	cell filling system
oil	vacuum pumps, hydraulic systems
potassium hydroxide	tanks
laboratory wastes	none

Except for the KOH tanks, all of the equipment listed was emptied when manufacturing ceased.

Lithium battery anodes are prepared by cutting or punching lithium metal under humidity controlled conditions. Waste lithium metal fragments remaining on the cutting and punching equipment were manually removed and handled and disposed as hazardous solid waste. The equipment was transferred to another manufacturing facility for continued use.

The blender and calendar equipment used for preparing and applying the cathode paste in lithium-SO_2 cell production have been disposed as scrap. Residual alcohol remaining on the equipment after production ceased would have evaporated leaving a residue of carbon.

The mixing cylinders used for preparing lithium-SO_2 electrolyte have been disposed as scrap. The cell filling system including the electrolyte storage tank and cell filling manifold has been transferred to another manufacturing facility for continued use. Prior to off-site shipment, the equipment was drained and flushed with acetonitrile. Residual acetonitrile remaining on the equipment would have evaporated. The cell filling manifold was dismantled and cleaned by dipping in baths of dilute sodium hydroxide. Drainage and cleaning solution was handled and disposed as a hazardous waste.

The solvent tank has been disposed as scrap. Prior to removal, the tank contents were pumped into drums and handled and disposed as hazardous wastes. Residual solvent remaining in the tank would have evaporated.

The freon still has been disposed as scrap. Prior to removal, the still bottoms were drained into drums and handled and disposed as hazardous wastes. Residues consisting of freon, solvent and water remaining in the still would have evaporated.

Equipment containing oil was variously disposed as scrap, shipped to another manufacturing facility for continued use or remains on-site. Equipment to be shipped off-site was drained. Waste oil was handled and disposed as a hazardous waste.

On-site treatment of KOH by neutralization can be performed in the storage tanks. Following treatment, the tanks would contain non-hazardous wastewater which, with approval, can be disposed of to the sanitary sewers. If the KOH is transported to an off-site TSD facility for treatment, the tanks will be rinsed to remove residual wastes. The collected rinsewater will removed with the KOH.

A hazardous waste is exempt from RCRA regulation until it exits the manufacturing equipment unless the equipment ceases to be used for manufacturing and the waste is contained therein for more than 90 days (40 CFR 261.4(c)). Thus, none of the manufacturing equipment is subject to RCRA regulation except the KOH tanks. Equipment contacting hazardous wastes after exiting manufacturing equipment is subject to RCRA.

All hazardous wastes, except waste alcohol, were collected into the drums used for on-site handling, storage in the hazardous waste storage facility and off-site transportation. Lithium batteries and metal were placed directly into the drums. Lithium-SO_2 electrolyte and freon still bottoms were drained into the drums. Waste solvent was pumped into the drums. Alkaline solution and oil was generated or collected in small containers which were manually emptied into the drums. Waste alcohol was collected by drip pans into a safety container which was hand carried to the hazardous waste storage facility where the contents were transferred into a 55 gallon drum.

The only equipment used in handling hazardous wastes after it exited manufacturing equipment were waste alcohol drip pans, solvent pumping equipment and small containers. Wastes would have drained from these equipment and remaining residues would have evaporated leaving negligibles residues. These items were disposed as scrap.

6a) "Description of the removal of accumulated residues, sludges and debris from floor trenches, interior manholes and duct work.

b) Please indicate trenches, manholes and ducts in a drawing.

c) Indicate that all accumulated residues, sludges and debris removed from floor trenches, interior manholes and duct work are either hazardous wastes or data will be supplied to demonstrate that they are not hazardous waste. Until approval is obtained from DEC that waste is non-hazardous, the waste should be handled as hazardous wastes and disposed of at an approved hazardous waste facility."

Drawing No. 2 of the On-site Report presents a floor plan of the plant indicating floor trenches, manholes and duct systems.

The East Floor Trench has an overflow dam at the north end. Liquids and sludge deposits remain in the upstream length of the trench. The results of sludge sampling and analysis are presented in Table 12 of the On-Site Report. The sludge would be considered a hazardous waste when discarded.

The west floor trench is a pipe trench with sand and debris on the bottom. The manhole in Room 27 of Area 7 also contains sand at the bottom. There may be other manholes inside the plant which will be identified during the building clean-up. The results of sampling and analysis of the residues in this trench and manhole are presented in Table 12 of the On-Site Report. Residues in the floor trench would be considered a hazardous waste when discarded. Residues in the manhole would not be considered a hazardous waste when discarded.

The results of sampling and analysis of the residues inside duct systems are presented in Table 9 of the On-Site Report. The highest concentration of heavy metals analyzed were detected in duct work systems ED-1, ED-2 and ED-3. Other duct work systems showed lower concentrations.

The floor trenches and manholes will be cleaned of liquids, sludges, sand and debris which will be collected in separate sets of drums. It is estimated that about 300 gallons of liquid will be removed from the east floor trench and will be pumped into one set of six drums. Sludge in this trench will be then pumped and shoveled into a second set of drums. It is estimated that about 6.7 tons of sludge will be removed filling about 26 drums. Sand and debris in the west trench and manholes will be vacuumed into drums. It is estimated that 3.3 tons of materials filling about 9 drums will be removed from the west trench and 2.5 tons of materials filling about 7 drums will be removed from each manhole.

A RCRA absorbent will be added to drums containing sludges from the East Trench to eliminate free liquids. These drums and the drums containing sand and debris from the west trench, which contain materials defined as hazardous wastes by previously reported analysis, will be disposed of to a hazardous waste disposal facility. Drums containing liquids from the east trench and sand and debris from the manhole will be transferred to the hazardous waste storage facility and will be sampled and analyzed to determine their characteristics so that appropriate disposal methods can be selected.

Representative samples from each drum containing liquids will be obtained and combined on an equal volume basis. Samples from each drum containing solids will be obtained using a tube sampler and combined on an equal volume basis. The two composite samples will be analyzed for EP toxicity and corrosivity if the samples are liquid.

The appropriate disposal method will be selected based on the analysis results. Alternatives for the disposal of liquid wastes include: 1) direct discharge to the sanitary sewer if the wastes are non-hazardous; 2) neutralization if the wastes are corrosive and discharge to the sanitary sewer and 3) transportation to an off-site TSD facility. Discharge to the sanitary sewer requires the approval of the Westchester County Department of Environmental Facilities and compliance with its discharge limitations.

If the analysis demonstrates that the solid wastes are non-hazardous, they will be disposed of to a landfill approved for industrial wastes. If the solid wastes exhibit hazardous waste characteristics, they will be disposed of to a hazardous waste landfill.

Trenches and manholes will be power washed with a detergent using the methodology selected for plant surface cleaning (refer to Item 7). Separate wipe samples of each trench and manhole will be taken during the wipe sampling program to document the level of cleaning achieved.

All duct work inside and outside the plant will be dismantled, handled and disposed of as hazardous waste even though some systems showed relatively low concentrations of metals. The cleaning of connected equipment such as air handling units, fans and air pollution control equipment is described in response to Item 7. Duct work will be cut into short sections, placed in polyethylene bags and carried to the hazardous waste storage room to be compressed and placed in drums. An estimated one ton of duct work will be generated filling about 6 drums.

7a) "Indicate in a drawing what walls are going to be cleaned and decontaminated.

b) How will the wastes generated from cleaning and decontamination of walls be collected?

c) Indicate that all wastes generated from cleaning and decontamination of walls are either hazardous wastes or data will be supplied to demonstrate that they are not hazardous wastes. Until approval is obtained from DEC that waste is non-hazardous, the waste should be handled as hazardous wastes and disposed of at an approved hazardous waste facility.

d) Describe cleaning of Air Handling Units and pollution control equipment."

Drawing No. 2 of the On-site Report presents a floor plan of the plant showing interior walls. All interior surfaces of the plant including ceilings, walls and floors will be cleaned. In addition, gravel on the roof above Area 10 and 11 will be vacuumed into a bulk collection vehicle and disposed of to a hazardous waste landfill.

It is proposed to clean these surfaces by a combination of vacuuming loose dust and power washing. The specific methodology will be established through a test program for cleaning the interior surfaces of a selected room. Variables to be evaluated in the test program include:

detergent selection;
requirements for rinsing; and
treatment and recycling of wash water.

After cleaning, wipe sampling will be performed to demonstrate the cleanliness which can be achieved. Samples will be analyzed for lead, mercury and zinc. The method that achieves a level of cleanliness sufficient to allow the disposal of the building demolition debris to a C&D landfill will be used to clean the remainder of the building.

Present area metal concentrations, presented in Table 7 of the On-Site Report, are summarized as follows:

	Area Metal Concentrations, mg/sf	
	Average	Range
Mercury	1.7	.076 - 30.
Lead	5.9	.062 - 220.
Zinc	6.4	.61 - 44.

The minimum mercury concentration occurred in Area 11a, which is the upper side of the center of the hung ceiling above the "dry room", Area 11. This part of the hung ceiling is a supply air plenum through which filtered conditioned air flows into Area 11. The maximum mercury concentration occurred on shelf areas, called ceiling samples, in Area 4. Other areas of high mercury concentration were Area 13, the attic floor, where 17 mg/sf was measured and Area 14, the boiler room, where 9.3 mg/sf was measured on floor and shelf areas. None of these areas of high concentration were regularly cleaned and the accumulation of residues probably resulted in the high mercury measurements.

The minimum lead concentrated also occurred in Area 11a. The maximum concentration occurred on the floor of Area 5, the room where lead compounds were blended to prepare the cathodes of lithium solid cells.

The occurrence of zinc does not appear to be related to the location of either past manufacturing processes or cleaning activities. The lowest concentration occurred in Area 11c, which is the upper side of that part of the hung ceiling above the "dry room" serving as the return air plenum and the floor area of mechanical room 56B which is exposed to return air. The highest concentration occurred on shelf areas in Area 12, the second floor, which had been used mostly as an office area.

The "dry room" and the associated air plenums and mechanical equipment room were constructed in the 1970's after the production of mercury and silver oxide-zinc ceased. The supply air plenum to the room had been exposed only to conditioned filtered air during the time that solid lithium batteries were produced and lead was being handled in the plant. It would be expected, as wipe sampling had confirmed, that mercury and lead concentrations in this area would be low. Cleaning plant surfaces should reduce concentrations to levels similar to that in the supply air plenum. It is estimated that the average concentration of each metal remaining after cleaning should not exceed .1 mg/sf. The test program will demonstrate the actual concentrations which can be achieved.

The building contains about 250,000 square feet of interior floor, wall and ceiling area. The anticipated quantity of any one metal remaining after cleaning should be about 25 grams (.05 lbs). For mercury, this is two to four times less than the content of a typical indoor-outdoor thermometer or mercury electrical switch. Within this range of metal concentrations, the debris resulting from demolition should be acceptable for disposal to a C&D landfill.

For the test program, a sill will be placed at the entrance to the room to be cleaned and floor drains will be blocked. Wash water runoff will be collected using a wet vacuum and various treatment processes, such as elementary neutralization and sedimentation, will be evaluated to permit reuse, discharge to the sanitary sewer or to identify the requirements for off-site treatment at a TSD facility.

All other wastes generated during the test program will be collected in drums, transferred to the hazardous waste storage facility, analyzed for hazardous waste characteristics and disposed accordingly.

Interior surfaces of the plant will be cleaned on a room by room basis using the techniques established in the test program. The room or area being cleaned will be isolated using existing doors or by hanging polyethylene sheets across open access ways. A sill will be placed at each access way to retain wash water.

Prior to cleaning room surfaces, furnishings which are not firmly attached will be removed. Carpets will be vacuumed to reduce possible dust generation, rolled, packaged in polyethylene sheets and handled and disposed as hazardous wastes. Loose fixtures such as venetian blinds, open grill hung ceiling panels and lighting fixtures will be removed, vacuumed, power washed or manually scrubbed and placed in a 20 cubic yard roll off bin.

The room being cleaned will first be vacuumed if there is a considerable amount of loose dust present. Attic insulation and dirt on the interior roof surfaces of Area 10 will be vacuumed into a bulk container truck. Other loose materials will be vacuumed into drums.

Surfaces will then be pressure washed. Runoff to the floor including that generated by fixture washing will be collected by wet vacuuming and transferred to a storage tank prior to treatment or handling in accordance with the method(s) established in the test program.

The areaway at the southeast corner of the plant where the baghouses, cyclones and KOH tanks are located will be temporarily enclosed by polyethylene sheets to permit cleaning the cyclones and baghouses. Sheeting will be placed over and across the areaway to control fugitive dust. Sheeting will be placed under the baghouses and cyclones to collect any spillage which may occur during cleaning. Residues remaining in the cyclone, baghouses and hoppers will be collected in drums. These residues may have a reuse value. Filter bags will be removed and placed in drums. The interior surfaces of this equipment will be vacuumed into drums and power washed. Runoff will be collected through the hopper outlets and low points of conveyor troughs and drained or pumped into drums.

The filters in air handling units will be removed and placed in polyethylene bags and transferred into drums. The interior surfaces of the air handling units and fans will be vacuumed into drums and pressure washed. Runoff will be collected at low points of the equipment and drained or pumped into drums.

About 450 gallons of SO_2 scrubber liquid remains on-site. The results of sampling and analysis of this material is presented in Table 13 of the On-Site Report. The liquid would be considered a hazardous waste.

Scrubber liquid has been transferred into drums. The holding tank will be rinsed. The rinse water will also be collected in drums. These drums and those containing wash waters from air pollution control equipment and air handling units will be transported to a TSD facility.

After cleaning, temporary enclosures and sills will be removed. These and other miscellaneous materials used for cleaning and worker safety will be packaged in polyethylene bags. These bags and the drums containing vacuumed materials and filters will be transferred to the hazardous waste storage facility and handled and disposed of as hazardous wastes.

Finally a wipe sampling program, similar to that described in the On-Site Report, will be performed to document the level of plant surface cleanliness achieved. A representative number of loose fixtures, which had been cleaned and transferred to a roll-off bin, will also be wipe sampled to document the level of cleanliness achieved. The bin would be divided into four quadrants and one type of each fixture, i.e. lighting fixture, ceiling panel and venetian blind, will be randomly selected in each quadrant for wipe sampling. All wipe samples will be combined into a single composite sample. Wipe samples will be analyzed for lead, mercury and zinc.

8a) "Describe how will the hazardous wastes generated from cleaning and decontamination of equipment and walls will be packed for disposal at an approved hazardous waste facility.

b) There is a discrepancy between volumes of liquids and sludge indicated in Page 9 of report and the number of drums to be used to pack these volumes, indicated in Page 10 of the report. Please explain."

The estimated quantities of wastes to be generated during the plant cleaning is summarized in Table 2. Most of these wastes have been discussed in response to Items 6 and 7. Miscellaneous wastes include an estimated 20 cubic yards of loose fixtures which have been cleaned and about 10 drums of dust on plant surfaces removed by vacuuming. Safety equipment includes an estimated 10 drums of worker safety equipment and 10 cubic yards of materials used for isolation and fugitive dust control. These materials include polyethylene sheeting and support frames.

Wastes designated by an asterisk will be handled, transported and disposed as a hazardous waste. The 14 drums of scrubber liquid will be transported to a TSD facility. Sludges and solids will be disposed of to a hazardous waste disposal facility.

The six drums of liquids removed from the East Floor Trench and bulk wash water runoff will be sampled, analyzed and will be either pretreated, if required, for disposal to the sanitary sewer or will be transported to an off-site TSD facility (see Item 6). The 33 drums of wash water run-off from air pollution control equipment and air handling units will be sampled and analyzed to select the most appropriate method of disposal. A high level of contamination is anticipated and disposal to a TSD facility will probably be required.

Residues remaining in air pollution control equipment may have resale value and, if feasible, will be sold to a recycling facility.

DURACELL INC.
NORTH TARRYTOWN, NEW YORK

TABLE 2

ESTIMATED QUANTITIES PLANT CLEANING WASTES

	Liquids		Sludges		Solids		
	Bulk Quantity (gal)	Number of Drums	Total Quantity (tons)	Number of Drums	Weight (tons)	Number of Drums	Bulk Quantity (cy)
1. Floor Trenches, Manholes							
East trench		6	6.7	26*			
West trench					3.3	9*	
Manholes (two)					5.0	14	
2. Duct work					1.0	6*	
3. Roofing					48.		35*
4. Insulation					2.5		92
5. Air Pollution Control Equpment							
Residues					9.8	14*	
Bags					0.1	1*	
Scrubber Liquid		14*					
Wash water		11					
6. Air Handling Unit							
Filters					0.1	1*	
Wash water		22					
7. Interior Cleaning							
Area 10 Interior Roofs					0.8		6
Carpets					3.4		6*
Miscellaneous					10.1	10*	20
Wash Water	15,000						
8. Safety Equipment					5	10*	10*
	15,000	53	6.7	26	89.1	65	169

Note: * To e handled as hazardous wastes

Hazardous wastes will be packaged for off-site transportation in accordance with the U.S. Department of Transportation regulations (49 CFR 173, 178 and 179). The wastes, with a few exceptions, are classified as hazardous wastes, liquid or solid, N.O.S. within the hazard class "ORM-E". These materials may be transported either in packages conforming to P173.24 or by bulk vehicles which have all discharge openings securely closed during transportation. The exceptions are acidic or alkaline liquids and residues remaining in air pollution control equipment.

Liquids may be either waste acid, liquid, N.O.S. or waste alkaline liquid, N.O.S. within the hazard class "corrosive material". Such liquids will be shipped in drums or bulk containers conforming to Part 173, Subpart F, corrosive materials.

Air pollution control equipment residues are classified as waste mercury compound, solid, N.O.S. within the hazard class "Poison B". These residues will be shipped in drums conforming to Part 173, Subpart H, Poisonous Materials.

The quantity of waste materials presented on Page 9 of the Closure Plan was estimated based on information available at the time the report was prepared and differs from the quantities presented in this addendum report. The estimated number of drums presented on Page 10 of the Closure Plan, reflects these quantities as follows:

Solids: $\frac{21 \text{ tons}}{75 \text{ lbs/cf}} \times \frac{2000}{7.35 \text{ cf/drum}} = 75 \text{ drums}$

Sludges: $\frac{20 \text{ tons}}{9.17 \text{ lbs/gal}} \times 2000 = 4400 \text{ gal}$

Liquids: $= \underline{4000 \text{ gal}}$

SUBTOTAL $\frac{8400 \text{ gal}}{50 \text{ gal/drum}} = 170 \text{ drums}$

Waste quantities presented in the Closure Plan and this addendum report are summarized as follows:

Waste	Closure Plan	Addendum Report
Liquids	19,000 gal	18,000 gal.
Sludges	20 tons	6.7 tons
Solids	20 tons	89.1 tons

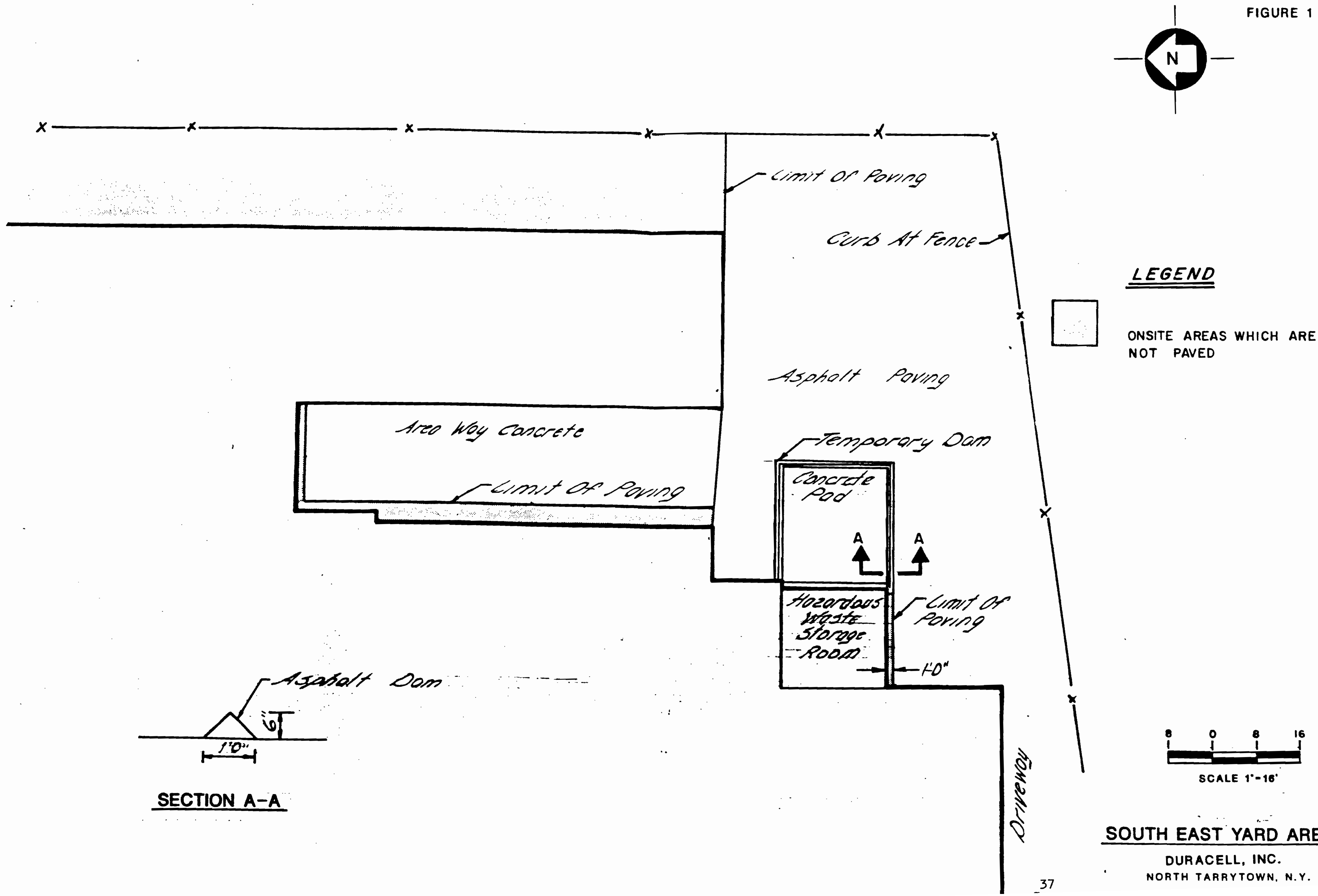
The estimated quantity of liquid wastes are about the same, sludge wastes have been reduced and solid wastes have been increased. Sludge quantities were reduced by refining the calculation methods. Solid quantities were increased through more detailed calculations of roofing, carpets, cleaned fixtures and bulk safety equipment quantities which were previously estimated.

9) "Page 11 of the report indicates that there is an "impervious surface around the storage area." But on Page 4, it is indicated that the backyard is "generally paved." These two statements should be consistent. Please clarify."

Figure 1 shows a plot plan of the southeast yard area with the Hazardous Waste Storage Facility consisting of two storage rooms and concrete pad. The temporary dam will be constructed to collect runoff from washing activities related to decontamination of the Hazardous Waste Storage Facility (refer to Item 11). Most of the yard area, including the driveway along the south property line, is either paved with asphalt or concrete. An asphalt curb is located along the south and east property line. The limit of paving is indicated at the southeast corner of the plant. Two thin strips of non-paved areas are located along the west side of the areaway and adjacent to the south wall of the storage rooms.

The soil remediation program, described in the On-Site Report, includes removal of soil from much of the southeast yard area. This includes most of the non-paved area in the areaway and adjacent to the storage rooms.

FIGURE 1



SOUTH EAST YARD AREA

DURACELL, INC.
NORTH TARRYTOWN, N.Y.

10) "How will Duracell determine what is hazardous wastes from cleaning the site? A Waste Analysis Plan for determining what is hazardous waste must be submitted to the Department as part of the Closure Plan."

Table 2 summarizes the wastes expected to be generated during plant cleaning. The asterisk designates those wastes to be handled and disposed of as hazardous wastes. The following wastes were demonstrated by prior sampling and testing, reported in the On-Site Report, to be hazardous:

- east trench sludge:
- west trench solids;
- roofing; and
- scrubber liquid.

The following wastes are defined as hazardous because of the probable high levels of contaminants:

- duct work;
- air pollution control equipment bags;
- air handling unit filters;
- carpets;
- miscellaneous wastes - drummed vacuumed materials; and
- safety equipment.

These wastes will not be sampled.

Air pollution control equipment residues were also demonstrated to be hazardous wastes but may have recovery value. If sale for recovery is feasible, these materials will not be disposed. These materials will also not be sampled.

Some wastes to be disposed will have been cleaned and will be disposed of as construction and demolition debris. This includes miscellaneous bulk wastes consisting of cleaned loose fixtures such as venetian blinds, ceiling panels and lighting fixtures. The acceptability for disposal of these materials to a C&D landfill will be demonstrated during the test cleaning (refer to Item 7).

The remaining wastes will be sampled and analyzed to determine the appropriate handling and disposal methods. These include:

- east trench liquids - drummed;
- manhole solids - drummed;
- insulation solids - bulk;
- air pollution control equipment wash water - drummed;
- air handling unit wash water - drummed;
- Area 10 interior roof solids - bulk; and
- wash water liquids - bulk.

Representative samples from each drum containing liquids will be obtained using a coliwasa type sampler. Samples from each drum containing solids will be obtained using a tube sampler. Samples from each type of waste will be combined on an equal volume basis. A sample representative of the entire volume of bulk materials will be obtained for analysis. Bulk containers will be divided into four quadrants and one sample, representative of the entire depth will be obtained in each quadrant and combined on an equal volume basis. Liquid samples will be obtained using a coliwasa type sampler and solid samples will be obtained using a tube type sampler. Composite samples from each bulk container will be analyzed separately. Samples will be analyzed for lead and mercury using EP toxicity procedures and corrosivity if the samples are liquid. Bulk safety equipment will not be sampled and will be disposed as a hazardous waste.

A Quality Assurance Plan, prepared for the remediation program, will be implemented to ensure the integrity and accurate analysis of samples. Samples will be collected, preserved and analyzed in accordance with "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-070, March 1983. EP toxicity and corrosivity will be determined in accordance with EPA Regulations for Identifying hazardous Waste 40 CFR 261. The laboratory will follow the Quality Assurance Procedures described in "Test Methods for Evaluating Solid Waste" SW-846, U.S. Environmental Protection Agency, April 1984 including duplication of sample analysis and the analysis of spiked samples and blanks.

11a) "Indicate in a drawing the dam to be built around the building as a containment for wash waters and rinse waters. Describe the dam height and how will the wastewater be collected in the dam; dam capacity; estimated volume of wastewater; dam material; dam removal after job is completed and dam disposal.

b) Page 9 indicates that liquids from building surface cleaning will be pumped into bulk tanker trucks. This does not seem to be consistent with the proposal to contain wash waters and rinse waters behind dam."

The proposed dam around the Hazardous Waste Storage Facility is shown in Figure 1. The area enclosed by the dam is:

Concrete Pad	18' x 21'	378 SF
Storage Rooms	17' x 19'	323 SF
		701 SF

and the containment volume is 2600 gallons. The estimated amount of wash and rinse water to be generated in cleaning the hazardous waste storage facility should not exceed 300 gallons. Runoff will be collected by wet vacuuming. Following cleaning, the dam consisting of 15 cubic feet of asphalt will be scrapped and packaged in polyethylene bags for disposal as hazardous waste.

Page 9 of the Closure Plan refers to cleaning the interior surfaces of the plant building, not the hazardous waste storage facility. Runoff from this cleaning operation will either be treated on-site for reuse or collected in bulk containers for transport to an off-site treatment facility.

12a) "What equipment will be used for cleanup operations?

b) How will that equipment be decontaminated?

c) Demonstrate that equipment is decontaminated.

d) Specify what equipment will be discarded and how it will be disposed of."

Specialized equipment to be used in cleaning the plant are listed in Table 3. Liquids and sludges in the East Floor Trench will be pumped and shoveled into drums. Sand and debris in the West Floor Trench and manholes will be vacuumed into drums. Duct work will be dismantled and cut using cutting torches and shears, manually compressed and placed in drums. Roofing gravel, attic insulation and dust on the interior roofs of Area 10 will be vacuumed into bulk haul trucks. Residues remaining in cyclones and baghouses may be collected in small containers which will be emptied into drums. Long handled brooms may be required to assist in emptying residues from the equipment. Filter bags will be cut using shears and placed in drums. Wash water runoff from air pollution control equipment and air handling units will be collected in containers and pumped into drums. Miscellaneous dust will be vacuumed into drums. Surfaces will be washed using portable power washers. Runoff will be wet vacuumed and pumped into bulk tanks for treatment or transportation off-site. Wet residues will be removed by sponge mopping. Worker safety equipment will be collected in drums. Materials used for isolation and fugitive dust control and wash water runoff retention will be collected in enclosed roll-off containers.

The unloading truck bays will be designated as a decontamination area to which all cleaning equipment will be brought. This area is easily isolated by roll up doors and has a natural slope to collect wash water. Temporary dams around truck levelers will be provided and floor drains will be sealed. Polyethylene sheeting will be placed to contain wash waters.

DURACELL INC.

NORTH TARRYTOWN, NEW YORK

TABLE 3

SPECIALIZED CLEANING EQUIPMENT

1. Floor Trenches	
East Trench	pump, shovels
West Trench	portable vacuum
Manhole	portable vacuum
2. Duct work	cutting torch sheetmetal shear
3. Roofing	bulk vacuum
4. Insulation	bulk vacuum
5. Air Pollution Control Equipment	
Residues	long handled brooms, containers
Bags	shears
Scrubber Liquid	pump
Wash water	containers, pump sponges
6. Air Handling Units	
Filters	--
Wash water	Container pump, sponges
7. Interior Cleaning	
Area 10 Interior Roofs	bulk vacuum
Carpets	shears
Miscellaneous	portable vacuum
Wash Water	wet vacuums, pump, tank sponge mops

Some low cost equipment such as shovels, brooms, shears, mops small containers and miscellaneous hand tools will be either discarded or cleaned. If discarded, this equipment will be packaged in polyethylene bags or will be cut if required and placed in drums for disposal as a hazardous waste. Vacuum filter bags, which prevent dust from entering blower assemblies, will also be discarded. Other equipment such as power washers, pumps and hoses, portable vacuum equipment will be flushed and washed with the detergent solution and rinse water. Wastewater will be handled with plant wash water runoff.

Representative equipment will be wipe sampled to demonstrate the level of decontamination achieved. After on-site decontamination is completed, polyethylene sheeting and temporary dams will be removed and disposed of as hazardous wastes.

The decontamination will be controlled by maintaining a log of equipment and personnel on the site to ensure that all items are decontaminated. The health and safety plan to be developed for the work will incorporate detailed decontamination procedures.

Bulk containers used to transport wastes to off-site disposal facilities will be decontaminated at the disposal facility. The wash water tank will be flushed and residues removed by sponge mopping. Roll-off containers will be washed at the disposal site after unloading. Wash water runoff will be discharged to the disposal facility wastewater treatment plant. The surfaces of bulk vacuum equipment which are exposed to collected materials will be wiped with a detergent solution and rinse water.

13) "Please submit itemized cost estimates giving unit costs and total costs."

The estimated cost for closure of the hazardous waste storage facility is presented in Table 4. The costs include installation of the temporary containment dam, cleaning the storage rooms and concrete pad, collection of wash water runoff, decontamination of equipment, and removal of the dam. Disposal costs assume that wash water runoff will be disposed of to a TSD facility and other materials to be discarded will be disposed of to a hazardous waste landfill. The cost of follow-up wipe sampling to document the results achieved, certification, preparation of closure documentation report and administration is included.

DURACELL INC.

NORTH TARRYTOWN, NEW YORK

TABLE 4

HAZARDOUS WASTE STORAGE FACILITY CLEANING

1.	Mobilization/Demobilization	$ 800
2.	Dam Construction	1,200
3.	Clean (sweep and power wash)	1,800
4.	Decontamination and Dam Removal	800
5.	Disposal	1,500
6.	Wipe Sampling	500
7.	Certification & Closure Plan	4,500
		$ 11,100
8.	Administration @ 15%	1,700
		12,800
9.	Contingency @ 20%	2,600
		$ 15,400

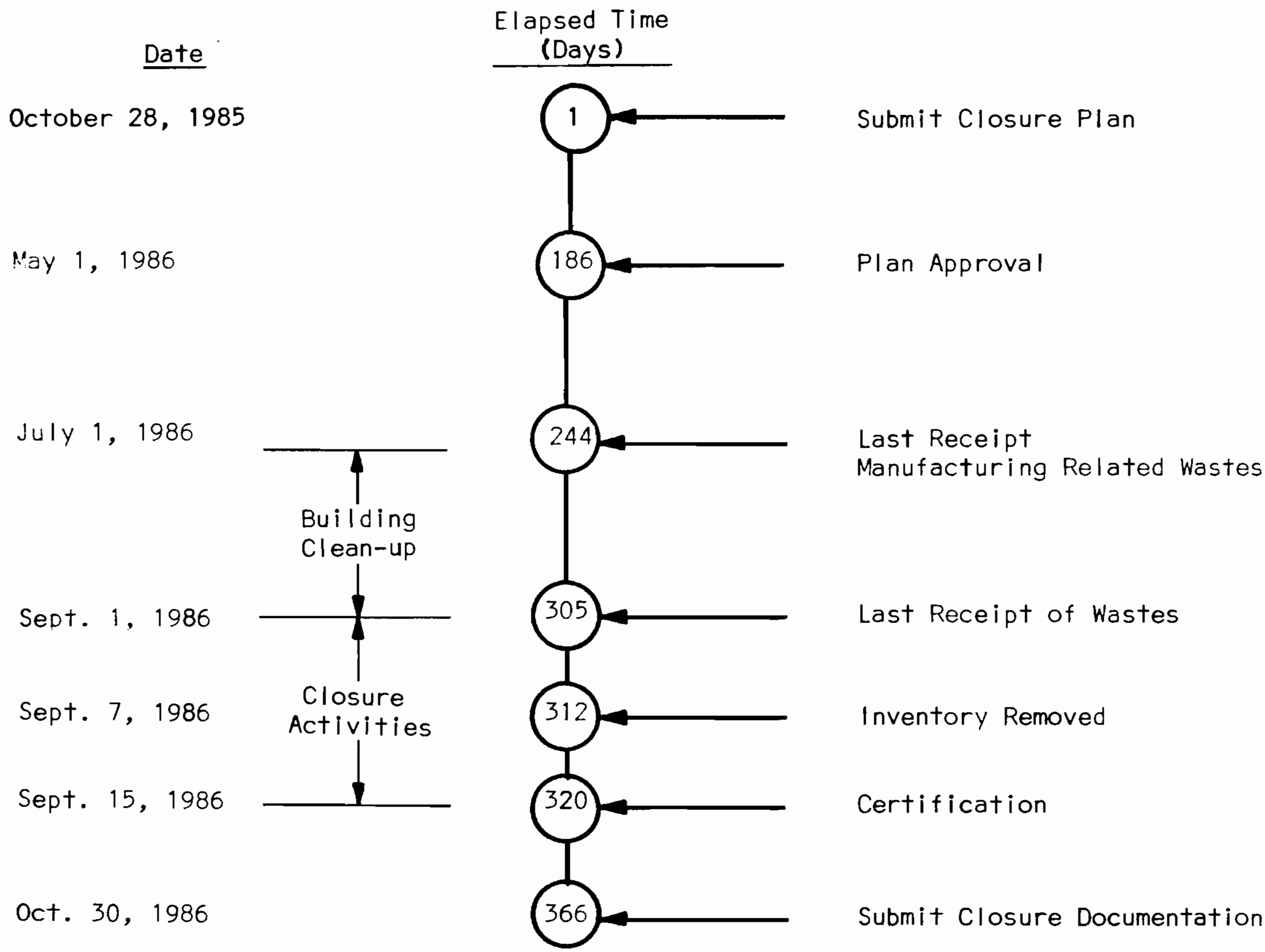
14) Revised Closure Schedule

The revised closure schedule is presented in Figure 2. The schedule is dependent upon the DEC approval of the remediation plans including building clean-up which must precede closure of the Hazardous Waste Management Facility.

FIGURE 2

DURACELL, INC.

NORTH TARRYTOWN, NEW YORK



Revised
Closure Plan

APPENDIX A

SEWER USE DOCUMENTATION

DURACELL INTERNATIONAL INC.
Lithium Systems Division

K. Forrest

60 Elm Street • North Tarrytown, New York 10591 USA
Telephone 914-631-4014 • TWX 710-564-0810 Telex 131548

February 2, 1983

O'BRIEN & GERE ENGINEERS, INC.
701 WESTCHESTER AVENUE
SUITE 107W
WHITE PLAINS, NY 10604
ATTN: JOHN M. PAVAN

RE: WESTCHESTER COUNTY INDUSTRIAL
PRETREATMENT PROGRAM

Dear Mr. Pavan,

The following is in response to your letter dated January 28, 1983, regarding reclassification of Duracell U.S.A., as a non-significant industrial user. Our personnel, following up your detailed inspection, have insured us that non-domestic waste water is not being discharged into the sanitary sewer system. We have checked out all of our outgoing waste water lines, and have determined, as you have indicated in your letter, only domestic waste water and non-contact cooling water enter the sewer system.

Your immediate response and expertise concerning our particular situation has been greatly appreciated.

Very truly yours,

Gifford Perman

GIFFORD PERMAN
DIRECTOR OF OPERATIONS

GP/tl

O'BRIEN & GERE

January 28, 1983

Mr. Kenneth Forrest
Facilities Engineer
Duracell International, Inc.
60 Elm Street
Tarrytown, NY 10591

Re: Westchester County Industrial Pretreatment Program

File: 882.009 #2

Dear Mr. Forrest:

Pursuant to our meeting at your facility on January 27, 1983, this letter is to serve as notification of the reclassification of Duracell International, Inc. as a Non-Significant Industrial User. This reclassification is based on the fact that after inspection of your industry's discharges, no process wastewater is discharged to the sanitary sewer system. Domestic wastewater and non-contact cooling water are the only wastewaters discharged to the County sanitary sewer.

In order to support this reclassification, a statement is needed from Duracell stating that no non-domestic wastewater is discharged to the sanitary sewer system. Upon receipt of this letter, your industry shall be considered a Non-Significant Industrial User.

Should any questions arise in this regard, please contact me at (914) 948-6766.

Very truly yours,

O'BRIEN & GERE ENGINEERS, INC.

John M. Pavan

JMP/df

APPENDIX B

DOCUMENTATION

NORTH TARRYTOWN FIRE DEPARTMENT
NORTH TARRYTOWN, N. Y.

File Copy

Fire Patrol
Org. 1876

Pocantico Hook and Ladder
Org. 1878

Rescue Hose Co. No. 1
Org. 1887

Union Hose Eng. Co. No. 2
Org. 1887

Columbia Hose Co. No. 3
Org. 1899

LAWRENCE P. KOSILLA, JR.
Chief Engineer

GORDON FERGUSON
First Assistant Chief

RICHARD GREEN
Second Assistant Chief

6/1/84

TO: MAYOR ZEGARELLI

FROM: CHIEF KOSILLA

RE: HAZ MAT SPILL DURACELL BATTERY

/31/84 →	12:55/pm	FIRST REPORT OF BAD SMELLING WATER NEAR DURACELL BATTERY . POLICE ON SCENE REQUESTS ALARM # 12
	1:04/pm	FIRE CHIEFS ON SCENE, CHIEF KOSILLA REQUESTS GENERAL ALARM. SPILL CONTAINS HIGHLY FLAMABLE LIQUID.
	1:10/pm	CHIEF SPOTA AND LT. BROPHYON SCENE. UNABLE TO CONTACT JOHN BIROS. TRUSTEE KING ON SCENE AND OKED ORDERS FOR SAND.
	1:40/pm	HEALTH DEPT., N.Y.S.DEPT. OF TRANSPORTATION, AND N.Y.S. DEPT. OF ENVIRONMENTAL CONSERVATION NOTIFIED.
	4:00/pm	RECALL SOUNDED.

HOURS OF SERVICE--3hrs 5min.

53 MEN RESPONDED TO THE ALARM

160 TOTAL MAN HOURS.

EACH APPARATUS USED APPROX. 5 GAL. FUEL AT AN AVERAGE COST OF $.1.25/GAL.=$ 50.00

WEAR AND TEAR ON APPARATUS APPROX.= $ 1,080.00

BROKEN OR DAMAGED EQUIPTMENT: 9 prs. GLOVES. TOTAL COST=$ 171.00
3 SHOVELS. TOTAL COST= $ 75.00

LENGTH OF SPILL: FROM DRIVEWAY AT REAR OF DURACELL DOWN ANDREWS LA. TO BEEKMAN AVE.,DOWN BEEKMAN AVE TO ENTRANCE OF G.M. ON LOWER BEEKMAN AVE.

NORTH TARRYTOWN, N.Y.

Fire Patrol
Org. 1876

Pocantico Hook and Ladder
Org. 1878

Rescue Hose Co. No. 1
Org. 1887

Union Hose Eng. Co. No. 2
Org. 1887

Columbia Hose Co. No. 3
Org. 1899

LAWRENCE P. KOSILLA, JR.
Chief Engineer

GORDON FERGUSON
First Assistant Chief

RICHARD GREEN
Second Assistant Chief

6/1/84

(CONTINUED)

AGENCIES THAT RESPONDED: KEN McHALE, HEALTH DEPT. COUNTY OF WESTCHESTER.

SUDHIR JAGIRDAR, N.Y.S. DEPT. OF ENVIRONMENT CONSERVATION.

KEN McHALE OF DEPT. OF HEALTH TOOK SAMPLES OF LIQUID FROM CATCH BASIN AT BOTTOM OF BEEKMAN AVE., BUT NO RESULTS WERE AVAILABLE AT TIME OF REPORT.

ACTION TAKEN: SPILL WAS DIKED AT END OF DURACELL DRIVEWAY TO PREVENT MORE SPREAD. SPILL WAS ALSO DIKED ON LOWER BEEKMAN AVE.

SAND FROM VILLAGE WAS THEN HEAVILY SPREAD OVER ENTIRE SPILL AREA.

THE SAND SPREAD ON THE SPILL ON ANDREWS LA WAS LOADED ON TO VILLAGE TRUCKS AND DUMPED ON DURACELL PROPERTY AS ORDERED BY SUDHIR JAGIRDAR, N.Y.S. DEPT. OF ENVIRONMENTAL CONSERVATION.

THE REMAINING SAND ON BEEKMAN AVE. WAS TO BE REMOVED BY DURACELL AS ORDERED BY SUDHIR JAGIRDAR.

PROPANOL -
BLACK CARBON - } mixture of both was spilled } per Duracell.

Duracell In.er-Office Mei.io

To: L. Uzel

Date: June 13, 1984

Copies: G. Perman

From: K. Forrest

Subject: SPILL AT NORTH TARRYTOWN FACILITY

On Thursday, May 31, 1984 an undetermined amount of water, alcohol, carbon black and teflon dispersion solution was accidently dumped onto the back-yard driveway. The spill happened between 12:30 P.M. to 1:00 P.M. The liquid solution black in color ran from our driveway down Andrews Lane, down Beekman Avenue to a catch basin at General Motors. One close by resident noticed the liquid and called our local Police Department . They summoned the Fire Department, which arrived and proceeded to stop the flow using sand along the gutters from our plant to GM.

I arrived on the scene and indicated to the Fire Department that there was no danger due to the fact there was very little alcohol in the solution. Very shortly thereafter, the County Health Department and N.Y.S. EPA arrived to inspect the spill. They were called in by the local Fire Dep-artment. After discussing the exact nature of the liquid involved and inspecting the area by which the liquid flowed, we decided to take a sample and have it analized in house for alcohol content. It proved to be 99% water and 1% all other materials.

The county at this time said we would have to clean the catch basin of liquids which had entered and clean the sand from the streets and remove as industrial waste by a licensed transporter. Friday, Saturday and Monday we proceeded to clean the streets of sand. We soaked up at 30% of the liquid in the catch basin Friday. It rained Friday night and the remaining liquid was washed out of the catch basin presumably to the Hudson River. It was estimated to be about 1 cubic foot of liquid due to the very thin layer that sat on top of the water already in the catch basin. All the sand accumulated was then put into 55 gallon drums, labeled non-hazardous industrial waste and removed June 7, 1984 by a lic-ensed transporter. After removal, I notified the County Health Department. They were pleased the job was done and have not heard from them since.

KENNETH FORREST
Facilities Engineer

P.S. The county did take samples of the liquid in the catch basin, but it was indicated to me that they were only going to check for alcohol.

..uctions

PLEASE TYPE

Part A:

DEPARTMENT OF ENVIRONMENTAL CONSERVATION

HAZARDOUS WASTE MANIFEST

DOCUMENT NO. NY 161501

GENERATOR NAME: DURACELL U.S.A. — PHONE: (914) 631-4014 — EPA ID NO.: NYD000692011

SITE ADDRESS: 60 ELM STREET, NORTH TARRYTOWN, NEW YORK 10591

TRANSPORTER NO. 1: CHEMICAL WASTE DISPOSAL — PHONE: (212) 274-3339 — NYD07744426

SITE ADDRESS: 42-14 19th STREET, ASTORIA, NEW YORK 11105

TRANSPORTER NO. 2 — PHONE

SITE ADDRESS

TREATMENT, STORAGE OR DISPOSAL (TSD) FACILITY: CHEMICAL WASTE DISPOSAL — PHONE: (212) 274-3339

SITE ADDRESS

THIS FORM IS NO. 1 OF A TOTAL OF 1 THE FIRST MANIFEST DOCUMENT NO. IS NY 1615014

To Be TYPED by Generator

	PROPER US DOT SHIPPING NAME	US DOT HAZARD CLASS	UN/NA NUMBER	FORM	NET QUANTITY	UNITS	CONTAINERS NO.	CONTAINERS TYPE	EPA HAZ CODE	EPA WASTE TYPE
1										
2										
3										
4										
5										
6										

SPECIAL HANDLING INSTRUCTIONS INCLUDING CONTAINER EXEMPTION (i.e. IDENTIFICATION OF ADDITIONAL WASTES INCLUDED IN SHIPMENT OF A NONHAZARDOUS NATURE WHICH DO NOT HAVE TO BE MANIFESTED) 40 (99) ea. 55 gallon drums consisting of sand with minute quantities of carbon black powder, teflon dispersion, alcohol water and surfactant - total moisture 99% water - 1% all other materials.

GENERATOR'S CERTIFICATION. This is to certify that the herein named materials are properly classified, described, packaged, marked and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation and the EPA. The wastes described herein were consigned to the transporter named. The TSD Facility can and will accept the shipment of hazardous waste, and has a valid permit to do so. This shipment also conforms with all applicable State regulations. I certify that the foregoing is true and correct to the best of my knowledge.

GENERATOR'S SIGNATURE: Kevin P. Bowe
Please type name also

DATE SHIPPED: 06 07 84 (Mo. Day Yr.) — EXPECTED ARRIVAL DATE: 06 07 8[illegible] (Mo. Day Yr.)

TRANSPORTER NO. 1 SIGNATURE "To the best of my knowledge the contents of the shipment I have accepted for transport conforms with the description on this manifest." A. BIGGERS

TRANSPORTER NO. 1 PERMIT NUMBER: 2A-[illegible]

DATE RECEIVED: 06 07 8[illegible] (Mo. Day)

COPY 3 Generator—Retained by Generator

Tear at this Perforation

Customer Signature Kevin Bowe Date 6/7/84

NOT RESPONSIBLE FOR ANY DAMAGE OR LOSS AS A RESULT OF THE USE OF ANY CONTAINER LEFT IN YOUR POSSESSION AND NOT IN OUR CARE OR CUSTODY

HAZARDOUS MATERIAL

. of
. Conservation
...tion No. 41-009

SERVICE TICKET AND INVOICE

NO. 17013

CHEMICAL WASTE DISPOSAL CORP.

STATE D.E.C. #
NY 2A-029
FEDERAL E.P.A. #
NYD077444263

42-14 19th AVENUE • ASTORIA, NEW YORK 11105
(212) 274-3339

SERVICE AND PICK-UP INFORMATION

Date: 6/6/84 P.O. #

Customer: DURACELL INTERNATIONAL

Department:

Address: 60 Elm Street

North Tarrytown, N.Y. 10591

Person to Contact: Ken Forest

Telephone: (914) 631-4014

Location:

CWD Representative: MNL

QUANTITY AND UNITS				HAZARDOUS MATERIALS DESCRIPTION AND MANIFEST LIST ATTACHED WHEN APPLICABLE	DOT CLASSIFICATION AND LABELING
55 GAL. DRUM	30 GAL. DRUM	5 GAL. CAN	OTHER DESCRIPTION		
				Potentially hazardous laboratory chemicals packed & removed for disposal	
				Solvents	
				Oils	
				Process waste	
				Acids	
				Caustics	
				OTHER:	

4 drum contaminated soil, sand, charcoal organics.
NY State Manifest # 1615014
NON-RCRA regulated industrial waste

Customer Signature Kevin Born Date 6/7/84

NOT RESPONSIBLE FOR ANY DAMAGE OR LOSS AS A RESULT OF THE USE OF ANY CONTAINER LEFT IN YOUR POSSESSION AND NOT IN OUR CARE OR CUSTODY

HAZARDOUS MATERIAL

APPENDIX C

REFERENCED TABLES, FIGURES AND DRAWINGS FROM ENGINEERING REPORT EVALUATING ON-SITE RESIDUES

DURACELL INTERNATIONAL
NORTH TARRYTOWN, NEW YORK

TABLE 7

AREA METAL CONCENTRATIONS

Area	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver	Zinc
1 floor	<.0014	.99	.011	.034	.35	.11	<.0014	.015	3.0
ceiling	<.0014	.12	.030	.070	.78	1.2	<.0014	.073	4.0
2 floor	<.0010	.84	.0084	.0068	.27	.39	.0019	.015	1.3
ceiling	.0035	1.5	.046	.25	1.2	.56	.0058	.13	21.
3 floor	<.0015	1.2	.069	.18	8.6	1.1	.0043	.11	3.6
ceiling	.014	.24	.26	.30	2.2	3.7	.0046	.34	13.
4 floor	.34	1.7	.41	.13	10.	3.4	<.0014	.11	3.7
ceiling	4.4	.96	.81	.37	4.6	30.	<.0020	.15	7.1
5 floor	.010	2.1	.36	.079	220	6.9	.012	.15	4.6
ceiling	.014	.06	.15	<.0023	56.	.56	.0023	.058	.98
6 floor	.016	.59	.14	.063	1.8	.82	.0035	.24	13.
ceiling	.035	.71	.72	.15	11.	5.6	.010	.36	36.
7 floor	.033	.23	.054	.043	4.5	1.2	.0036	<.0015	6.2
ceiling	.0068	.13	.28	.072	2.2	4.5	<.0011	.19	34.
8 floor	.0044	1.3	.028	.061	1.7	.21	.0035	2.6	5.1
9 floor	.014	1.9	.060	.17	2.7	.61	.0013	< .0015	9.0
10 floor	.048	.64	.099	.13	4.0	1.9	.0016	.086	5.7
a.2	.0054	1.3	.059	.044	7.2	.64	.00045	.071	6.5
11	<.00053	.070	.038	.027	.38	.30	<.00053	.028	.81
a.	.0078	.050	.0024	.0068	.062	.076	<.00060	.011	2.2
b.	.0054	.074	.078	.022	.17	.11	.00066	.027	.61
c.	.017	2.7	.063	.044	1.4	2.4	.0010	.083	10.
12 floor	.0037	3.0	.047	.085	1.7	.97	<.0012	.27	5.5
ceiling	<.0021	1.0	.060	.10	.91	.35	<.0021	.037	44.
13 floor	.039	1.5	.13	.46	5.0	17.	.0060	.63	12.
14 floor	.076	2.7	.11	2.5	3.1	9.3	<.0021	.14	28.
15 floor	.097	1.2	.041	.62	5.5	2.6	<.0022	.29	31.

NOTES: All units are mg/sf

DURACELL INTERNATIONAL
NORTH TARRYTOWN, NEW YORK

TABLE 9

DUCT WIPE SAMPLE ANALYSIS

Sample Designation	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver	Zinc
ED-1	3.4	8.4	11.	150.	170.	660.	4.4	< .23	260.
ED-2	1.3	12.	3.8	7.4	210.	14.	.078	< .092	3.0×10^4
ED-3	.0065	.18	.059	.050	1.5	680.	< .00072	130.	72.
ED-4	.0065	.29	.073	.31	1.3	.85	< .00074	.074	30.
ED-5	.012	.048	.020	.11	.70	.36	< .0013	< .0016	.62
ED-6	.068	.19	.039	.042	1.5	1.6	.0010	.0032	20.
ED-7	.018	.70	.024	.28	2.2	.83	< .0013	< .0015	.81
ED-8	.0034	.44	.037	.032	1.6	.22	< .0013	< .0014	2.7
SAD-1	.00079	.028	.010	.037	.22	1.08	< .00087	.011	15.
RAD-2	.012	.41	.24	.072	2.4	16.	.0060	.067	61.

NOTE: All units are mg/sf

DURACELL INTERNATIONAL
NORTH TARRYTOWN, NEW YORK

TABLE 12

MISCELLANEOUS E.P. TOXICITY SAMPLE ANALYSIS

Sample	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver	Zinc
RCRA Limits	5.0	100.0	1.0	5.0	5.0	.2	1.0	5.0	--
East Floor Trench	.01	< 1.0	< .01	< .01	< .03	1.79	< .01	.13	.52
West Floor Trench	< .01	< 1.0	.02	< .01	.04	2.27	< .01	< .01	.26
Manhole Area 7	.01	< 1.0	< .01	< .01	< .03	.007	< .01	.01	1.00
Baghouse 1, 2 & 3	< .01	< 1.0	< .01	< .01	<.03	23.95	.02	.14	4.32
Baghouse 4	< .01	< 1.0	<.01	< .01	<.03	1.09	.01	< .01	.07
High Vac	< .01	<1.0	.20	< .01	.24	27.75	.01	< .01	3.66
Area 3 Sheetrock	< .01	< .05	< .01	< .01	<.03	< .01	< .01	< .01	.11

DURACELL, INC.

NORTH TARRYTOWN, NEW YORK

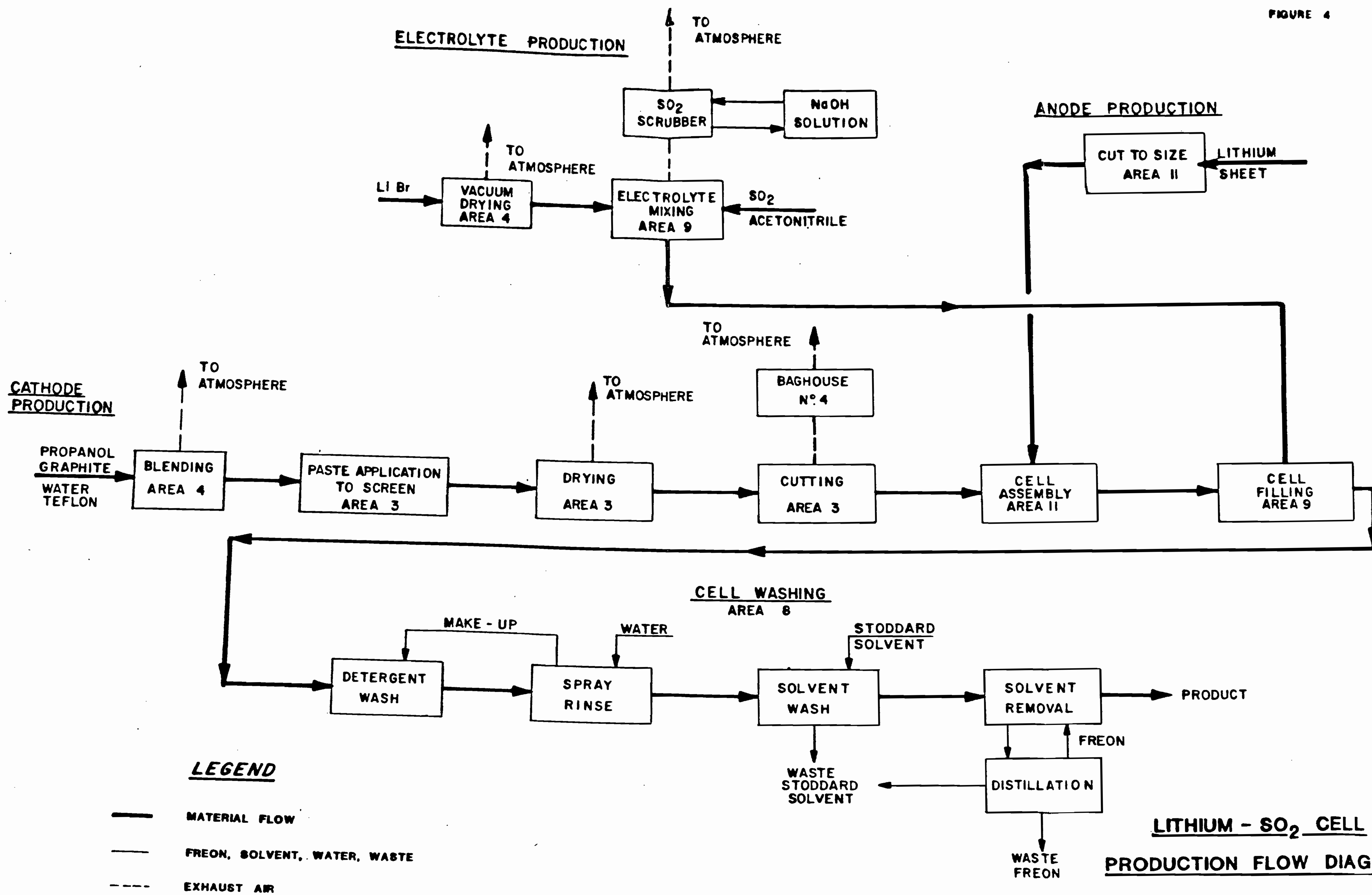
TABLE 13

MISCELLANEOUS TANK SAMPLE ANALYSIS

Analysis	RCRA Limits	KOH Tanks	Scrubber Tank	Concrete Pit
pH	2- 12	13.8	9.9	--
Reactivity	--	none	none	--
Arsenic	5.0	0.24	0.58	0.01
Barium	100.0	0.05	0.05	0.05
Cadmium	1.0	0.01	0.01	0.61
Chromium	5.0	0.79	0.01	0.01
Lead	5.0	0.48	0.03	0.03
Mercury	0.2	0.01	0.08	0.01
Selenium	1.0	0.01	1.21	0.01
Silver	5.0	0.10	0.05	0.01
Cyanide	--	--	--	0.02
Zinc	--	0.01	0.32	0.07

Note: all units are mg/l

FIGURE 4

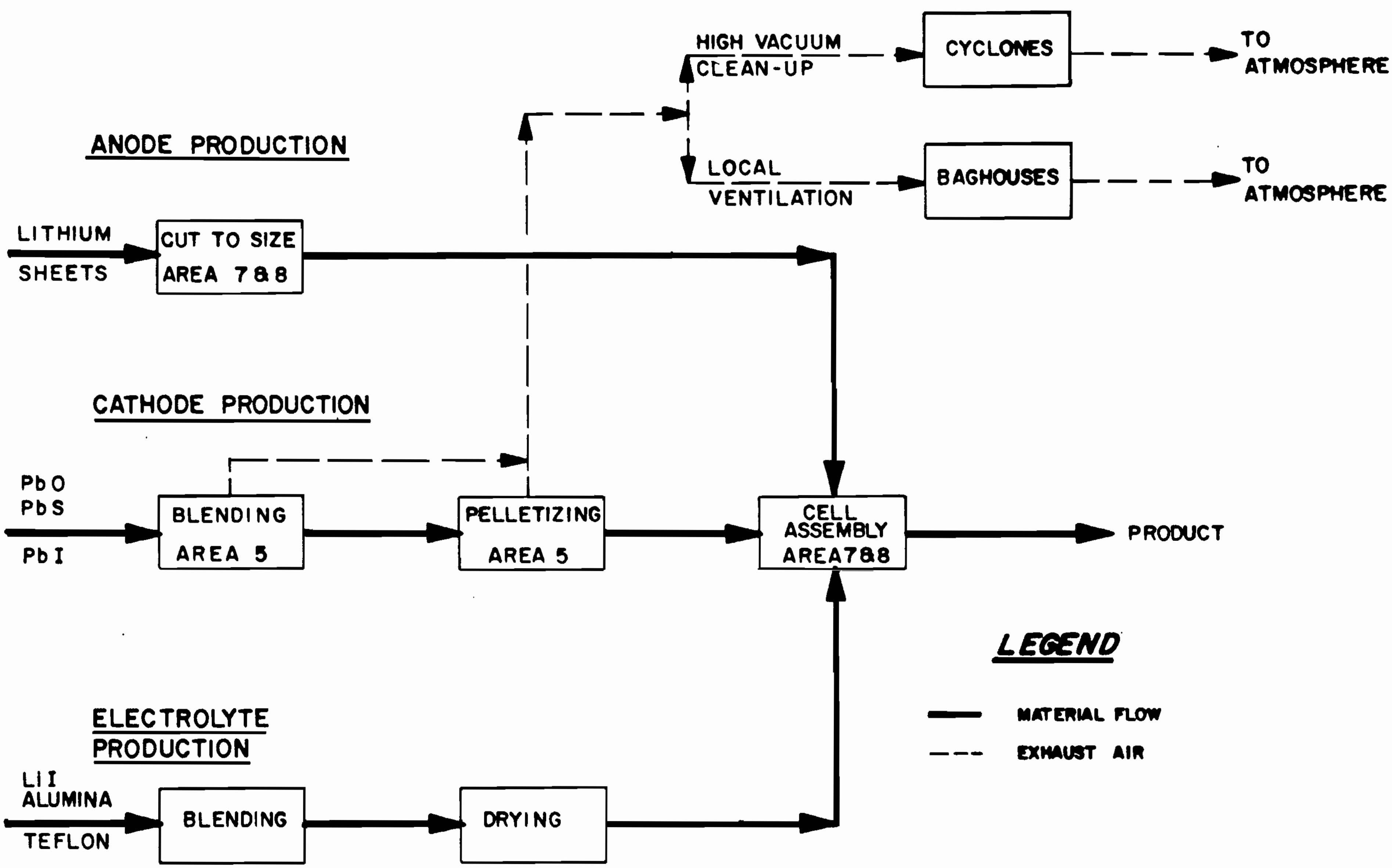


LITHIUM - SO_2 CELL

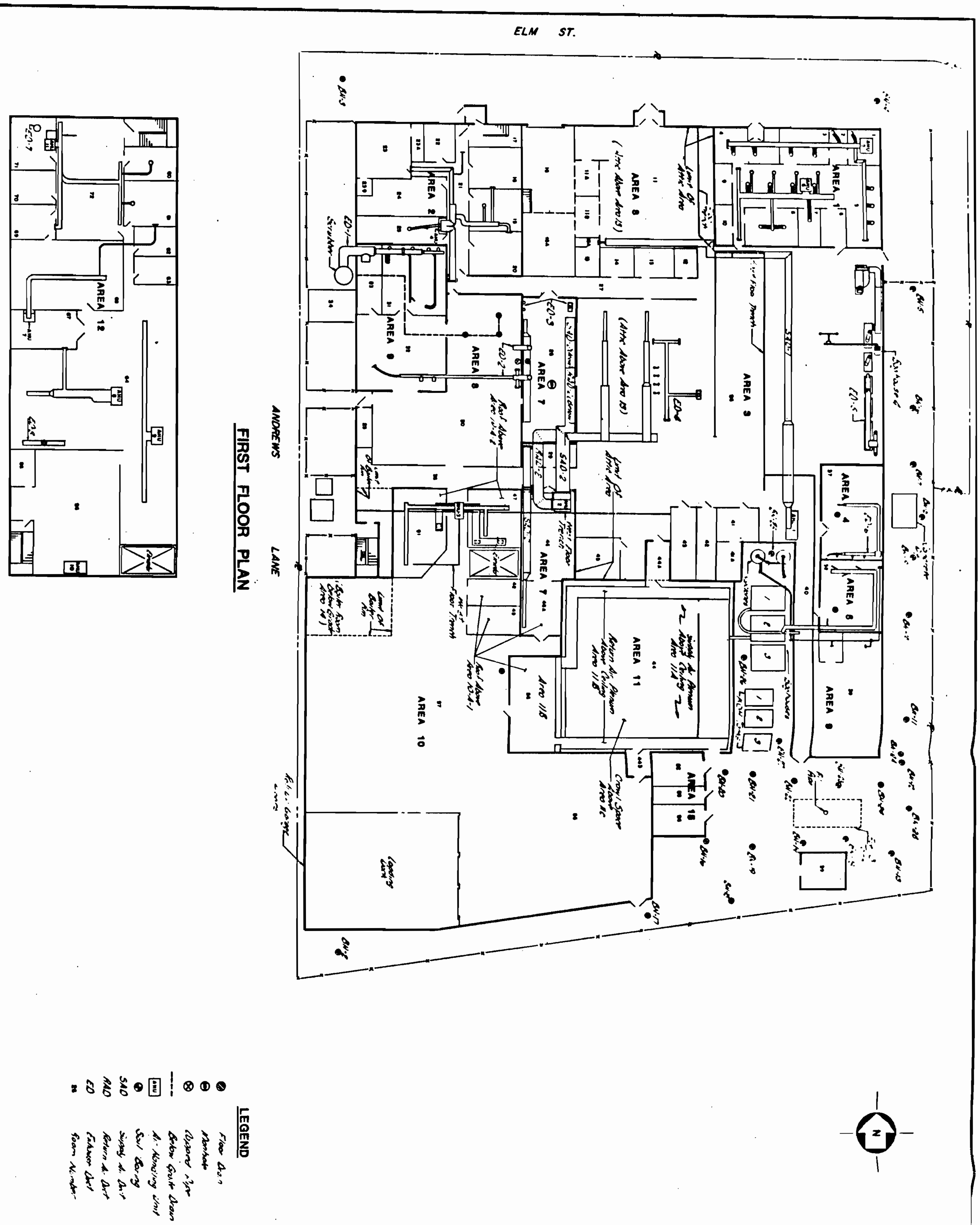
PRODUCTION FLOW DIAGRAM

DURACELL INTERNATIONAL INC.

FIGURE 8



LITHIUM SOLID CELL PRODUCTION FLOW DIAGRAM



ON-SITE RESIDUE EVALUATION STUDY

DURACELL INTERNATIONAL, INC.

NORTH TARRYTOWN, NEW YORK

eder associates consulting engineers, p.c.

PROJECT: ON-SITE RESIDUE EVALUATION STUDY, DURACELL INTERNATIONAL, INC., NORTH TARRYTOWN, NEW YORK

TITLE: BUILDING & SAMPLING PLAN

DWG No. 2

REVISIONS | DATE | BY