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FROM: DUE: 03/30/04 EDO CONTROL: G20040126  
DOC DT: 02/19/04  
FINAL REPLY:

Vincent V. Abate  
Community Board No. 1  
The City of New York, New York

TO:

Chairman Diaz

FOR SIGNATURE OF : \*\* GRN \*\* CRC NO: 04-0091

Virgilio, NMSS

DESC:

ROUTING:

2.206 - Radiac Research Corporation

Travers  
Norry  
Paperiello  
Kane  
Collins  
Dean  
Burns/Cyr  
Miller, RI  
Zimmerman, NSIR  
Cyr, OGC  
Skay, NRR  
Goldberg, OGC

DATE: 02/24/04

ASSIGNED TO: CONTACT:  
NMSS Virgilio

SPECIAL INSTRUCTIONS OR REMARKS:

OFFICE OF THE SECRETARY  
CORRESPONDENCE CONTROL TICKET

Date Printed: Feb 24, 2004 09:20

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**ACTION OFFICE:** EDO

**AUTHOR:** Vincent Abate  
**AFFILIATION:** NY-NY  
**ADDRESSEE:** Nils Diaz  
**SUBJECT:** Renewal Application for Radiac Research Corp.

**ACTION:** Appropriate  
**DISTRIBUTION:**

**LETTER DATE:** 02/19/2004

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**FILE LOCATION:** ADAMS

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EDO --G20040126

4398

*The City of New York*



**COMMUNITY BOARD No. 1**

435 GRAHAM AVENUE - BROOKLYN, N.Y. 11211-2429

PHONE: (718) 389-0009

FAX: (718) 3890098

Email: [cb1brooklyn@nyc.rr.com](mailto:cb1brooklyn@nyc.rr.com)

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BROOKLYN BOROUGH PRESIDENT



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CHAIRMAN

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February 19, 2004

CHAIRMAN REC'D  
04 FEB 20 PM 3:44

Hon. Nils J. Diaz  
Chairman  
US Nuclear Regulatory Commission  
11555 Rockville Pike  
Rockville, MD 20852

Re: Radiac Research Corporation  
33 South First Street  
Brooklyn, NY 11211

Dear Chairman Diaz:

Community Board No. 1 is writing in regards to the renewal application for Radiac Research Corporation, a hazardous waste storage and transfer facility that poses substantial environmental, environmental justice and homeland security issues in New York State. We have voiced our opposition to the New York State Department of Environmental Conservation requesting that they deny the issuance of permits for this facility.

Currently, the Radiac Research Corporation is operating a waste storage facility for radioactive materials in Williamsburg under an administrative agreement and is in the process of completing a renewal application. The Board is concerned about the community's safety, health and welfare, especially in these trying times of heightened security. It has continuously voiced opposition to this facility in the past and will continue to do so in the future.

Radiac operates two contiguous storage and transfer stations – one for hazardous waste and one for radioactive waste. They are in a predominantly minority community in Williamsburg, Brooklyn. Radiac's block and its immediate neighborhood were mostly industrial when the facility first opened in the 1970s but since then have become primarily residential. Not only are there occupied apartments with small children immediately next door to Radiac -- there is now a public school with 1,200 students just a block away, and Grand Ferry Park, a public waterfront park located a half a block away.

In the hazardous waste facility, Radiac stores large quantities of flammable liquids, oxidizers, poisons, and other chemicals. In the contiguous radioactive waste facility, Radiac stores a wide variety of isotopes, and is even allowed to store plutonium. The two facilities have accumulated a long history of violations of the environmental, radiological, and health and safety regulations.

According to Radiac's own fire consultant, the fire suppression system is woefully inadequate to prevent a minor fire from becoming a conflagration of catastrophic proportions. It should go without saying that such a facility poses an unacceptable opportunity to terrorists and an unacceptable temptation to local vandals, especially in view of the inadequate security precautions.

Radiac was last subjected to a serious regulatory review in 1988. Its permit was renewed then based largely on the industrial character of the neighborhood. The permit expired in 1992, but it has remained in effect because Radiac applied for renewal before the expiration, and in the more than a decade since then NYS DEC has not acted.

We understand that NYS DEC has decided to hold hearings on the permit renewal. Community Board No. 1 strongly believes in consideration of the renewal application, that all of the regulatory agencies should apply current standards of environmental protection and fire safety. These standards would prohibit the concentration of such large quantities of incompatible wastes in such a small area, and would also ban their placement in a residential area.

Radiac is not the only facility that can handle these materials. There are other permitted facilities in New York City, Westchester County and Long Island – some for hazardous wastes, some for radioactive wastes. None of them has the design flaws of Radiac or its proximity to occupied residences. Moreover, much of the waste handled at Radiac is generated out of state – indeed, some of it comes from as far away as California. There is no reason that so much of the nation's hazardous and radioactive wastes should be funneled through the streets of Brooklyn into this unsuitable facility.

It is the position of the Community Board No. 1 members, based on a recent "Risk Assessment" that Radiac poses a potential "dirty bomb" hazard to Lower Manhattan, Brooklyn and part of Queens, depending on wind direction at

the time of an accident. We have forwarded these concerns to the Federal Bureau of Investigation (FBI), and include a copy with this correspondence.

After considering the evidence that will come forth at the hearings, we believe that the US Nuclear Regulatory Commission will agree that the Radiac permits should not be renewed and that the facility should be immediately closed.

Sincerely,

A handwritten signature in cursive script that reads "Vincent V. Abate". The signature is written in black ink and is positioned above the printed name and title.

Vincent V. Abate  
Chairman

VVA/mbw  
Attachments: 1

*The  
City  
of  
New York*



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MEMBER-AT-LARGE

January 29, 2004

Mr. Robert S. Mueller III  
Director Federal Bureau of Investigation (FBI)  
935 Pennsylvania Avenue, N.W.  
Washington, D.C. 20535-0001

Dear Mr. Mueller:

We are writing to urge the FBI to conduct an inspection of Radiac Research Corporation, and to review related permits and violations. It is the position of Community Board No. 1 members, based on a recent "Risk Assessment", that Radiac poses a potential "dirty bomb" hazard to Lower Manhattan, Brooklyn, and part of Queens, depending on wind direction at the time of an incident.

Radiac is a hazardous chemical waste and radioactive waste storage and transfer facility located at 33 South First Street in the Williamsburg section of Brooklyn. Radiac's second entrance is on Kent Avenue, the most significant truck thoroughfare in Williamsburg. It sits in the middle of a large, and growing, residential population. It is one-half block from P.S. 84, an elementary school which has 1,100 children. The immediate population, according to recent census figures, is 110,000 residents. The attached map shows the proximity of Radiac to residences, schools, and other uses. It is several blocks North of the Williamsburg Bridge. The operations manager of the facility is John Tekin Jr., whose telephone number is (718) 963-2233.

Local environmental organizations including the Community Board No. 1's Environmental Committee, Neighbors Against Garbage (N.A.G.), Williamsburg Watch, and El Puente, working in concert with all of our local elected officials, are being represented in the current New York State Department of Environmental Conservation ("DEC") permit response by Michael Gerrard and Richard Webster, of the law firm of

Arnold & Porter. We have a hearing before the Nuclear Regulatory Commission tentatively scheduled for February 20<sup>th</sup> in Washington, D.C.

Michael Gerrard has also made presentations at meetings with the Mayor's Community Assistance Unit (April 2003), EPA Region 2 Administrator Jane Kenny (May 2003), NYSDEC Chief Counsel Jim Ferrier in Albany (May 2003), Region 2 Director Thomas Kunkel, NYS DEC and Commissioner of Legal, Jim Ferrier. NYS DEC, in L.I.C. (September 2003), and Homeland Security New York Director Andrew White (December 2003), in a meeting organized by Congresswoman Velazquez. Michael Gerrard can be reached at (212) 715-1190.

In each meeting we presented the Risk Assessment developed by Arnold & Porter for the legal response to the DEC Permit renewal. Marcia Bystryk of the League of Conservation Voters wrote a letter to the US EPA which she had signed by every major environmental organization in the tri-state area.

#### **I. Hazard Identification**

As you can see from the enclosed risk assessment that Arnold & Porter sent to the NRC on November 4, 2003, Radiac stores up to 15,094 gallons of oxidizers, poisons, flammable materials, explosives, reactive wastes, acids and bases in a small 3,300 square feet warehouse in an increasingly residential neighborhood. Adjacent to the hazardous waste store is a radioactive waste store that is authorized to store a number of types of radioactive materials, including enriched uranium and plutonium in quantities up to just below the critical mass; this part of Radiac is permitted by the federal Department of Labor; Radiac receives radioactive wastes from 12 states. The hazardous waste facility is still operating under a federally-delegated (EPA) permit issued by the DEC that expired in 1994; NYS DEC and US EPA are now considering whether to renew this permit. Past inspections by NYS DEC and US EPA have revealed numerous violations of the permit that could cause or contribute to a catastrophic accident, including use of corroded drums, stacking drums too high, using damaged pallets, failure to separate incompatible wastes, failure to properly train workers and falsifying training records.

Radiac's own fire consultant has found that the fire suppression system in the hazardous waste warehouse is inadequate and has recognized a number of violations of National Fire Protection Association ("NFPA") standards. In particular, he found that if a 55-gallon drum of heptane spilled and the resulting pool of heptane was ignited, the fire suppression system would not prevent flashover occurring in under one minute. This could result in a catastrophic fire at the facility. Up to 88 bulk 55-gallon drums of heptane may be stored at the facility at any one time. The fire consultant made numerous recommendations that would improve safety. Some of the recommended improvements are quite simple such as the use of metal rather than plastic drums and additional restrictions on the types of waste that can be accepted simultaneously. Others are more costly, such as installation of a new fire protection system, replacement of ordinary electrical equipment and the current forklift with models designed for operation in potentially flammable atmospheres, and ventilation of the shed in which the gases and

reactive chemicals are stored. We understand that Radiac has indicated it will not invest in new equipment until its DEC permit is renewed.

As you can also see from the letter to the NRC, Arnold & Porter's analysis of current conditions at the facility and relevant NFPA standards indicates that there are a number of current violations of NFPA codes that were not addressed by the fire consultant. We are extremely concerned that this facility is continuing to operate when Radiac's own consultant has highlighted serious hazards associated with the current operation. This facility would never be permitted today under NFPA codes (each of 15 different chemicals would require their own concrete chamber with a 50' width). A greater danger now exists within the community because Mayor Bloomberg has closed Engine 212, the closest firehouse to Radiac, the only firehouse that could have responded to a fire at Radiac within 1 minute, and the one engine company that had Haz Mat capability within Greenpoint/Williamsburg.

## **II. A Major Fire or Terrorist Attack at Radiac Could Lead to a Catastrophic Release of Toxic Materials**

In general, security at Radiac is poor. The main entrances to the radioactive and hazardous waste storage areas are located on public streets, and when loading and unloading occurs, facility doors are wide open; the interior areas are completely exposed and easily accessible. Even the most unsophisticated terrorist or vandal could cause an explosion and fire by shooting barrels of waste stored by either door with a handgun or throwing in a Molotov cocktail. In light of September 11th, the US Department of Transportation found a "critical need" to ensure security around facilities such as Radiac. A recent GAO report warned that chemical facilities are attractive targets and urged US EPA, the lead agency in protecting hazardous materials facilities from terrorism, and Homeland Security to develop a national strategy. Community Board No. 1 is requesting that the FBI intervene in the NYS DEC permit renewal and encourage the NYS DEC to deny the permit of a facility that is next to impossible to defend against terrorist threat or (an - take out) accident.

## **III. Chemical Safety and Hazard Investigation Board**

The dangers of placing hazardous chemicals in densely populated areas are vividly illustrated by the accident at Kaltech Industries on April 25, 2002. 42 people were injured, 12 of them critically, when a mixture of hazardous chemicals exploded in the basement of a loft building in the Chelsea section of Manhattan. The Chemical Safety Board (CSB) lead investigator found that a secondary fire started, but a catastrophic chemical fire was averted only because the sprinkler system was able to extinguish the flames. The investigator pointed to lack of inspection of the facility by the Fire Department and gaps in the New York City Fire Code. CSB chair Merritt said:

Despite federal, state, and local regulations already on the books, in this case a small business was able to handle large volumes of hazardous waste without following effective safety practices. We hope our findings

ultimately can help local authorities get the regulatory and enforcement tools they need to ensure safe chemical handling. The headline in the New York Times from the CSB Preliminary Findings on Kaltech Industries was: "Explosion in New York Cites Improper Mixing of Waste Chemicals, Lack of Workplace Safety Procedures" (April 16, 2003).

This accident -- not so different from what could happen at Radiac -- illustrates that a danger of having many different agencies regulating Radiac is that no one agency has all the information and takes full responsibility. US DOL regulates the radioactive waste and NYS DEC regulates the hazardous chemical waste; the agencies do not appear to communicate about the two permits even though the two halves of Radiac exist within one property.

To facilitate effective inter-agency communication on the hazards presented by the Radiac facility we believe it would be useful for all the agencies involved to closely coordinate their actions. We hope that we can meet with the FBI, and possibly other agencies, in the near future to discuss this situation.

The NYS DEC must take a hard look at whether Radiac should be allowed to continue operating in its current location, given the increasingly residential nature of the local community, the very real threat of terrorism at such a facility, Radiac's long history of permit violations that could contribute to a catastrophic event, and the practical difficulties of making the facility safe for the surrounding area. The FBI must consider that the serious physical and psychological consequences of a release of radioactive waste in an urban area make this facility particularly attractive as a target and vulnerable to attack.

Sincerely,



Deborah Masters  
Environmental Protection  
Committee Chair, CB #1



Vincent V. Abate  
Chairman

DM/VVA/mbw  
Enclosures

November 4, 2003

The Executive Director for Operations  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

**Petition Pursuant to 10 C.F.R. 2.206 Re: Radiac Research  
Corporation, Brooklyn, New York**

Dear Sir:

I received a letter from Martin J. Virgilio, dated July 31, 2003, advising me that my June 18, 2003 letter did not meet the criteria for consideration under 10 CFR 2.206, because it alleged insufficient facts to support consideration under NRC's common defense and security jurisdiction. Because we believe that a threat to common defense and security exists at Radiac, and this threat is not being considered by the local licensing agency, we are now submitting this petition that lays out in detail, with documentary support, why we believe such a threat exists. We believe this submission meets all the requirements for a petition under 10 CFR 2.206 and ask for consideration of this matter under the procedures specified by that regulation. We also request a meeting or teleconference between ourselves and the Petition Review Board prior to the Board review of this Petition.

My firm represents Neighbors Against Garbage, an environmental organization whose members include many individuals who live in the immediate proximity of the Radiac Research Corporation and who send their children to an elementary school less than a block away. Radiac's adjoining hazardous and radioactive waste storage and transfer facilities are located at 33 South First Street and 261 Kent Avenue in the Williamsburg section of Brooklyn. The attached map (Exhibit A) and photographs (Exhibit B) show the proximity of Radiac to residences, schools, and other uses.

The main entrance to the radioactive waste store is located on a public street (Kent Avenue). The hazardous waste store main entrance is located around the corner on another public street (South First Street). When loading or unloading is taking place, the roll-up doors are open and the interior areas are completely exposed -- but for the truck receiving or delivering the wastes. It would be a simple matter for a terrorist, or even a local vandal, armed only with a hand grenade or with a handgun and a molotov cocktail, to cause a conflagration that would release a plume of radioactive toxic waste into the air

of this residential community, a block from a schoolyard. The same result could be obtained by parking an explosive-laden automobile or truck in front of one of the entrances and detonating it remotely, at virtually no personal risk to the attacker. Even a plausible threat of such an attack -- such as parking a vehicle in front of the facility and then making a telephonic claim that it is rigged with explosives that will detonate upon contact -- would trigger a major crisis, in which the authorities would be faced with very difficult questions about the radius of evacuation and how to deal with the caller's demands. The response would be complicated by the easily foreseeable reactions of the parents of the 1,200 students at the public school a block away.

Further aggravating the risk of a terrorist attack are the following factors:

1. the adjoining hazardous waste store is permitted to handle flammable liquids, reactives, oxidizers, and other hazardous materials and has inadequate fire prevention and suppression systems;
2. the facility is located in a major population center close to lower Manhattan;
3. the Department of Justice ("DOJ") has stated that the risk of a terrorist attack on an industrial chemical store is "real and credible" and where a store is close to major population centers this risk is elevated;
4. security at the facility is poor;
5. the serious physical and psychological consequences of a release of radioactive waste in an urban area make this facility particularly attractive as a target and vulnerable to attack.

Although the State radioactive materials license was renewed recently, we did not receive notice of this renewal -- indeed, so far as we are aware, there was no public notice at all -- and therefore were not able to submit our views prior to final action being taken. As far as we can tell from responses to freedom of information requests and response to our letters by the New York State Department of Labor ("DOL"), the risk of an event at the hazardous waste store causing release of radioactive materials was not considered at all during the renewal process for the State radioactive materials license. I have also expressed health and safety concerns to DOL in my letter of June 18, 2003, attached as Exhibit C. DOL has attempted to respond to our concerns in a letter dated July 16, 2003, attached as Exhibit D. DOL did not dispute our allegation that the chance of an incident at the facility is greater than one-in-a-million per year, but instead offered assurance that the activity licensed to be present at the facility could not have a serious impact on the neighborhood. We have analyzed the evidence behind this assurance and have demonstrated in Section VI. of this petition that it compels a contrary conclusion.

Ordinarily a facility licensed to handle radioactive wastes will have a substantial buffer on all sides, and a secure perimeter; the Radiac facility is bounded on one side by a public road, on another side by a facility licensed to store flammable liquids and other hazardous wastes, on a third side by a residential building, and on a fourth side by a commercial business. We urge the NRC to use its residual power under its delegation agreement with New York State to protect the common defense and security.

#### **I. Jurisdiction Under Common Defense and Security**

We were disappointed that in its July 31, 2003 letter, NRC chose to rely on a distinction between "public health and safety concerns" and common defense and security concerns in order to abdicate its responsibility for ensuring the people of New York City are secure from terrorist attack at this radioactive materials storage facility. Ultimately, nearly all common defense and security concerns are based on concern for public health and safety. NRC has in fact repeatedly invoked common defense and security jurisdiction to respond to the terrorist attacks of September 11, 2001. According to the NRC website, NRC has issued orders that are designed to protect against "an insider terrorist attack, waterborne, airborne, and land-based assaults, as well as threats from a vehicle bomb." <http://www.nrc.gov/what-we-do/safeguards/911/faq.html#2>.

Just before our letter was sent, the Chairman of NRC stated that responses to security concerns may transcend jurisdictions for certain threats and that NRC, the states and others must work closely in developing responses. Nils J. Diaz, Remarks at the Joint NRC/DHS State Security Outreach Workshop, 3 (June 17, 2003). In this case, we acknowledge that some of our concerns raise issues that require co-ordination between NRC and DOL, but primary responsibility for protecting facilities that store radioactive materials against terrorist attack lies squarely with NRC. We are alleging that the Radiac radioactive waste store is a threat to common defense and security, because it is highly vulnerable to terrorist attack and is located in an area that makes it a very attractive target. This cannot be dismissed as a health and safety concern. It is at the core of NRC's responsibility to ensure that a hostile attack on a nuclear materials storage facility would not cause major harm to the American public. Therefore, we respectfully request that you address our concerns substantively and not attempt to pass the buck onto the State agency.

#### **II. NRC Risk Criterion**

On March 10, 2003 the NRC Licensing Board denied an application for an NRC license to build and operate a facility for storing spent fuel rods. NRC Atomic Safety and Licensing Board, Private Fuel Storage LLC, Partial Initial Decision, LBP-03-04 (March

10, 2003). The proposed site for the store was on the reservation of the Skull Valley Band of Goshute Indians, around 50 miles southwest of Salt Lake City close to a major military air-base. The reason for this decision was that there was more than a one-in-a-million chance per year of an F-16 aircraft crashing into the proposed facility. The Board ruled that it could not issue the license unless the applicant either lowered the risk of the event or showed that such a crash would not have appreciable health and safety consequences. The threshold risk level was based on the notion that facilities that store radioactive materials should be designed to withstand "credible" events. For nuclear power reactors, events having at least a one-in-ten-million per year chance of occurring must be taken into consideration during reactor design. The NRC adopted the one-in-a-million standard for the proposed spent fuel rod storage facility by reasoning that a crash into the spent fuel storage rod facility would have lower consequences than a crash into a nuclear power station because less radioactivity is present. NRC, CLI-01-22 Memorandum and Order, 54 NRC 255 (November 14, 2001).

We recognize that Radiac stores less activity than was proposed for the Utah facility, but the location of the Radiac facility in a very densely populated area with over 100,000 people within a mile increases the probable number of people that would be significantly adversely affected by a release of radioactivity. If similar reasoning to that used for the Utah facility is applied here, the decrease in the source term would be offset by the increase in the probable population affected.

We believe that the risk of a major event at the facility is orders of magnitude higher than one-in-a-million per year for the reasons discussed below. We further believe that it should be the burden of the licensee to demonstrate safety, once a credible risk of an incident is established. That is the practice the NRC followed for the Skull Valley decision and it should be followed in this instance. Although the burden is with the licensee to demonstrate safety, we would like to take this opportunity to demonstrate that a major event at the facility could have appreciable direct consequences for health and safety, as well as serious consequences in terms of post-event clean-up costs, economic impacts, and psychological effects. Below we lay out the basis for these beliefs.

### III. Description of the Existing Radiac Facility

According to the existing New York State Department of Environmental Conservation ("DEC") permit, Radiac Waste Corporation Permit No. 20-86-0035 (September 28, 1993), the hazardous waste portion of the facility is a warehouse that measures 100 feet by 33 feet. Entry is through a 20' overhead door which opens onto the street. Looking from the street, flammable solids, possibly including explosives, are stored on the front right hand side along the wall, with flammable liquids behind them.

Water reactive chemicals and up to 15 gas cylinders are stored at the back in a "shed." Oxidizers, poisons, acids, and bases are stored along the left hand wall. A total of 15 feet separates the flammable materials from the other waste types, with the exception of the water reactivities and gas cylinders, which are closer. The sprinkler system pump room is very close to the external door on the left hand side.

The DEC permit allows Radiac to store the following quantities of hazardous wastes (in gallons):

3,056	Poisons
7,000	Flammable liquids
1,760	Flammable solids
108	Reactive wastes
240	Oxidizers
<u>3,930</u>	<u>Acids and bases</u>
15,094	Total gallons

According to the manifest data for Radiac from 1990 to mid-2002, waste has been received at Radiac from all over the United States, including Alabama, California, Connecticut, Florida, Indiana, Kansas, Kentucky, Massachusetts, Maryland, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, Ohio, Pennsylvania, Rhode Island, Texas, Virginia and Wisconsin. Regular shipments are received from Connecticut, Massachusetts, New Jersey and Pennsylvania, in addition to New York. Overall, the facility serves about equal amounts of New York and out of state waste.

The radioactive waste store and the hazardous waste store both have separate truck entrances that are located on separate heavily trafficked public streets. It is not unusual for large semi trucks to travel along these streets. Because the entrances lie adjacent to the public highway, there is no room to place barriers that could prevent a truck being deliberately driven into either store through the steel roll up doors that seal both entrances. A door (normally kept open) at the back of the hazardous waste warehouse leads to the radioactive waste store.

The radioactive waste store is separately licensed by DOL. This license was recently renewed, but the terms of the current license, attached as Exhibit E, were redacted by DOL for security reasons before being released to us. We understand from DOL that the terms of the license are very similar to the previous license, attached as Exhibit F. Based on this license and discussions with DOL, we believe Radiac is allowed to store 50 curies of source and byproduct radioactive material, 100 curies of tritium, and

may store special nuclear materials, including plutonium and enriched uranium, at just below the regulatory definition of critical mass.

#### **IV. The Local Community**

The community within 1 mile radius of the facility consists of 115,000 people of whom 51,000 (44%) are hispanic, 10,000 (9%) are African-American, 7,000 (6%) are Asian. EPA Region II has classified the area as an Environmental Justice community, based on its ethnic mix and the high density of polluting facilities in the area. At the time the DEC permit was issued in 1988, this was a primarily industrial neighborhood, but in the ensuing years it has become increasingly residential. For example, a 70-unit apartment building was built half a block away in 2001.

Radiac occupies four adjoining buildings (one each for hazardous waste, LLRW, garage and office) on a block of attached buildings. Several of the other buildings on the block are occupied residences, including one that is on the other side of a wall from Radiac's office and parking area, and several that are within 40 feet of the hazardous waste and radioactive waste stores. In addition, an elementary school with 1,100 students and a large open-air playground is located a block away.

#### **V. Risk of a Major Event at the Facility**

The initiator of an event at the facility could be either an intentional attack or an accident. Because fire prevention systems at the facility are inadequate it is likely a small initial fire could rapidly escalate and turn into a major event.

##### **A. Fire Prevention is Inadequate**

In 2000, to assist EPA and DEC in evaluating issues arising from the permit renewal application, Radiac engaged a fire consultant, Rolf Jensen and Associates. The fire consultant's report, attached as Exhibit G, discussed two accident scenarios in detail - a pool fire resulting from the failure of a 55-gallon drum of heptane, and a similar scenario with a five-gallon drum of heptane. The current permit allows Radiac to store up to 88 bulk drums each containing 55 gallons of heptane. The fire consultant erroneously believed that heptane was not permitted to be stored in bulk at the facility, Exhibit G at 4, when in fact up to 88 bulk 55 gallon drums of heptane are permitted to be

stored in the hazardous waste store.<sup>1</sup> For this reason, he improperly dismissed the probability of such fires as "unlikely." For the 55 gallon drum fire, the fire consultant found that if an ignition source were present "the resulting fire would produce an enormous amount of heat within seconds" and that "flashover" would occur within a minute. The consultant found that the dry pipe sprinkler system that is currently installed at the facility would not activate until 20 seconds after the fire starts and the system may not deliver water until one minute after activation. He found a "high probability of catastrophic loss" and "the existing fire suppression system is inadequate to suppress a fire originating from a 55 gallon container of heptane."

Even for the five gallon drum fire, the consultant found that "the probability of ignition of secondary fuels is high" and the current sprinkler system would be "inadequate to control the fire." The consultant then stated that "Radiac has agreed to change the five gallon bulk flammable liquid containers from plastic to metal containers." When the analysis was repeated with this assumption, the consultant still predicted secondary ignition of 24 five gallon containers, but the fire was deemed controllable with the existing sprinkler system.

The standards of the National Fire Protection Association ("NFPA") were supposed to be met at this facility because it cannot achieve the 50 foot buffer distance required by RCRA and its New York equivalent.<sup>2</sup> Unfortunately, the facility does not currently meet NFPA 30 standards in several respects, most of which are discussed in the fire consultants report. However, the fire consultant failed to state that the NFPA 30 standard requires a four hour fire resistance rating between "liquid storage areas" and "any adjacent areas not dedicated to liquid storage." This was confirmed by a letter dated July 2, 1987 from the NFPA, attached as Exhibit H, which stated that "the only materials allowed to be stored in liquid warehouses are flammable or combustible liquids" and "[i]t would be foolish for a code to set limitations on products that fall within its jurisdiction, and then permit unlimited amounts of other products that pose different hazards." In fact, at present many different kinds of chemicals, including flammable liquids, explosives and oxidizers, are permitted to be stored in one room.

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<sup>1</sup> When OSHA inspected the hazardous waste store on May 5, 2003, it contained 5,400 gallons of flammable hazardous wastes, including benzene and other Type I, II and III flammables. Exhibit I at 6.

<sup>2</sup> See Letter from Conrad Simon, Director, Air And Waste Management Region II, EPA to N.G. Kaul, Acting Director Division of Hazardous Substance Regulation, DEC (February 12, 1988).

Although the fire consultant recommended many improvements to the fire suppression system, we understand that Radiac has refused to invest in new equipment until their DEC permit is renewed. This renewal has been pending since 1994. Thus, Radiac has knowingly chosen to operate the facility in an unsafe condition. This was recently confirmed when the Occupational Health and Safety Administration ("OSHA") inspected the hazardous waste store and cited Radiac for violations that had been highlighted over a year previously by Radiac's own fire consultant. See OSHA, Citation and Notification of Penalty (September 19, 2003), attached as Exhibit I. We do not believe that a licensee should be permitted to deliberately overlook a major deficiency that contributes to a high risk of release of radioactive materials.

#### **B. Risk of Terrorism or Intentional Attack**

Radiac's fire consultant also failed to consider the vulnerability of the facility to terrorism or other intentional attack. It is notable that the pump room for the sprinkler system is placed at the front of the facility, around 2-3 feet from the access door, and that flammable solids (possibly including some explosives) are permitted to be stacked 16 feet from this opening. With a grenade, or a handgun and a Molotov cocktail, an unsophisticated attacker could easily puncture the drums, cause a fire, and start a conflagration; a more sophisticated approach might start by disabling the sprinkler system near the front door. This final step is unnecessary because, as discussed above, the fire protection systems are inadequate. An alternative approach would be park an explosive-laden vehicle close to the entrance of one of the stores and detonate it remotely, or drive such a vehicle directly into one of the stores through the closed roll-up doors, which might not withstand a fast-moving car or truck.

The U.S. Department of Transportation ("DOT") has referred to the "critical need to assure the security of hazardous materials at fixed facilities" in the light of the "potential for continuing terrorist threats." 66 Fed. Reg. 59,200 (November 27, 2001). DOT put out a risk management framework aimed at enhancing the security of hazardous materials shipments against acts of terrorism or sabotage. DOT, Enhancing Security Of Hazardous Materials Shipments Against Acts Of Terrorism Or Sabotage Using RSPA's Risk Management Self-Evaluation Framework (January 2002). A GAO report found that chemical facilities may be attractive targets and recommended that the Department of Homeland Security and EPA develop a comprehensive national strategy to deal with the issue. GAO, Homeland Security: Voluntary Initiatives Are Under Way at Chemical Facilities, but the Extent of Security Preparedness is Unknown, 3-5 (March 2003). This report specifically stated that the Department of Justice "has concluded that the risk of an attempt in the foreseeable future to cause an industrial chemical release is both real and credible." Id. at 9. The report goes on to state that facilities are at higher risk "where

they contain large amounts of toxic chemicals and are located near population centers.” Id. at 9. The report is also careful to include facilities that house hazardous chemicals at below the threshold amounts to trigger the requirement for a Risk Management Plan as potential targets. Id. at 27.

The security at Radiac is extremely poor. The large roll-up doors that allow trucks entry to the stores could easily be penetrated by driving a truck or car directly into them. The radioactive waste store adjoins the hazardous waste store and the door between them provides an emergency escape route and therefore is not locked. This means that once entry is gained to one store, access is provided to both. Earlier this year, an activist climbed onto the roof of the facility in the middle of the afternoon to take some photographs illustrating the proximity of residences and schools. She was able to remain on the roof of the building for over an hour without challenge. Further evidence of unauthorized access to the roof is provided by the presence of graffiti “tags” on the roof parapet of hazardous waste store. See Exhibit B, Photograph 1. This shows that graffiti artists have also been on the roof. Finally, the gate to the parking area is almost always open and no security cameras are mounted on the exterior of the facility. It would be a simple matter for even a relatively unsophisticated attacker to gain entry. As illustrated above, once inside, an attacker could in a matter of seconds cause a fire that would “flashover” in under a minute. If the attacker left via the radioactive waste store and left the fire doors open, a release of radioactive materials as well as a huge cloud of toxic chemicals would be likely.

We believe that this facility is almost impossible to secure properly. It adjoins residential buildings whose occupants have access to the roof and open space behind the rear wall of the hazardous waste store. It adjoins public highways along which large semi-trucks regularly pass and sometimes park. In this age of severe and ongoing terrorist threat, it is, at minimum, extremely inadvisable to store radioactive materials within the population center that has proved the most attractive target for terrorists. The potential consequences of a release of radioactive materials from Radiac are discussed below.

### C. Chance of Accidental Event

Radiac’s fire consultant’s report also found that ignition sources are present in the facility such as ordinary electrical equipment, a forklift truck and wastes with the potential to spontaneously ignite. Disappointingly, over a year after Radiac’s own fire consultant highlighted these issues, OSHA found the first two problems were still present when it inspected the hazardous waste store on May 5, 2003. Exhibit I.

The fire consultant did not attempt to quantify the current probability of any of the fire scenarios. In addition, no assessment of the likely consequences was made. Normally, risk of an event is defined by the product of frequency with consequence, because we can tolerate a relatively high probability of a minor incident, but cannot tolerate more than a tiny probability of a catastrophic incident. Minutes of a meeting among the fire consultant, Radiac, EPA and DEC on December 1, 2000 show that the agencies wanted the consultant to carry out such an analysis, but that this was not agreed at the meeting.

The fire consultant's report failed to highlight potential failure modes that could initiate a spill. Such a spill could result from a drum being dropped while being unloaded or the forklift or a truck accidentally striking and puncturing a container in the very cramped space provided. To illustrate anecdotally that such a spill is quite possible, on March 3, 2001 heptane did spill from a five gallon bulk container that Radiac was collecting in New Jersey.

A particular hazard is presented by the way that loading operations take place at Radiac. Documents in the file confirm that 48 foot tractor-trailer trucks load and unload at the facility by backing into the container management area. A diagram drawn by DEC illustrates the situation when a tractor-trailer truck unloads at the facility. DEC, Comments on Radiac's November 15, 1999 Response to the NIA Dated September 19, 1999, 10 (January 31, 2000) attached as Exhibit J. The tractor trailer width is shown as 8.5 feet. The Container Management Area is only 9 feet wide at present. The street is 30 feet wide. This means the 48 feet long trailer has to be reversed into a narrow aisle that is lined by flammable and poisonous chemicals, while it is simultaneously turning. The chance of the reversing trailer striking and rupturing one or more drums is hardly trivial.

Additionally, a drum could fail in storage if it is in poor condition, is stressed by the weight of drums stacked on top or falls from a damaged pallet. Radiac has been fined in the past for violations that could lead to such conditions. It is also possible that drums could be ruptured by waste in another drum exploding or decomposing violently.

The fire consultant's report fails to mention that in case of a large fire, massive amounts of toxic fumes would arise from both the combustion products and evaporation of the extremely toxic chemicals in the store and that residences are within 40 feet of the property boundary. It also fails to assess whether such a catastrophic fire could result in release of radioactive waste from the adjacent LLRW store. The provisional consequence analysis presented below starts to address these issues.

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We believe that the stark findings of the fire consultant are actually based on optimistic assumptions. His assumption that the response time of the sprinkler system is 45 seconds is optimistic, because he also found that the dry pipe sprinkler system that is currently installed at the facility may not deliver water until one minute after activation. In addition, he assumed in the analysis that "no meaningful amounts" of Class 1A liquids will be found at Radiac's facility. In fact the facility is currently permitted to accept Class 1A materials in lab-packs. He also assumed that Radiac no longer stores plastic five gallon bulk drums of flammable chemicals. While we hope this is the case, it is not a regulatory requirement.

Another possibility not reflected in the fire consultant's report is a fire in a truck trailer that would be shielded from the sprinklers. DEC noted that a similar fire actually happened at another facility that, like Radiac, had operated without any fire for 20 years. Exhibit J at 9. In that case an organic peroxide started to decompose spontaneously at room temperature.

According to an NRC document, NUREG-1140, fire loss rates in unsprinklered commercial and industrial buildings are 0.006 per year. NRC, NUREG-1140: Regulatory Analysis on Emergency Preparedness for Fuel Cycle and Other Radioactive Material Licensees, 108 (January 1998). That is 6000 times greater than the one-in-a-million (0.000001) per year chance of a major accident used to reject the application for the Skull Valley facility. We believe the probability of a major incident at Radiac is considerably greater than 0.006 per year because, as demonstrated above, it is less safe than the average industrial building.

## **VI. Provisional Consequence Analysis**

We believe that if there is a major event, the licensed amount of radioactivity in the radioactive waste store is sufficient to cause appreciable health effects due to a short-term radiation dose delivered to those close the release, as well as long term effects due to contamination of the area with radioactivity.

### **A. Discussion of License Limits for Mixed Isotopes**

Condition 16 of the radioactive material license restricts the possession of any single material or a combination of materials to below the screening levels given in Table 7 of New York Industrial Code Rule 38. DOL took the position in a letter of July 16, 2003 (Exhibit D) that serious harm to neighbors was not possible because the activity limit of 50 curies is over two orders of magnitude lower than the activity limit of "packaged mixed waste" in Table 7, which is 10,000 curies. The screening levels in

Table 7 are derived from the analysis of potential health effects of releases caused by fire given in NUREG-1140. The screening level in Table 7 for "[a]ny other alpha emitter" is 2 curies and that for "[p]ackaged waste, alpha" is 20 curies. This indicates that the 10,000 curie limit probably does not apply to alpha wastes, which instead have a limit that is 500 times lower. This is because they are more dangerous when inhalation of the waste is possible, as could happen if there is a fire at the facility. In the alternative, if the phrase "packaged mixed waste" in the license was intended to include alpha wastes, this means that Radiac would be licensed to possess over two times the amount of alpha waste predicted in NUREG-1140 to have appreciable off site consequences.

Table 13 of NUREG-1140 gives the quantity of "[p]ackaged waste, beta gamma" predicted to cause 1 rem dose equivalent at 100 m in the event of a severe facility fire as 10,000 curies. This figure is derived by taking one tenth of the amount of "[m]ixed radioactive waste, beta-gamma, except I-131 and I-125" to produce the same effect. NUREG-1140 at 83. The factor of a tenth is due to assumed protection provided by the packaging. *Id.* Thus, NUREG-1140 makes it even clearer that the 10,000 curie screening value relied upon by DOL is not applicable to wastes that decay by emitting alpha particles, nor should it be used for iodine-131 or iodine-125. Because inhalation is the main exposure pathway, *id.* at 81, it is to be expected that alpha emitting wastes will be most likely to cause appreciable health impacts. Furthermore, the reduction in release by a factor of ten, assumed for the protective effect of the packaging, may be excessive in view of the intensity of the potential fire at the facility due to the permitted storage of large amounts of highly flammable chemicals, oxidizers and, possibly, explosives in a room adjoining the radioactive waste store. In addition, according to DEC annual reports on radioactive waste transport, some of the radioactive waste is stored in wood or fiber boxes or plastic pails. See e.g. DEC, 2001 New York State Low-Level Radioactive Waste Transportation Report, 7 (October 2002).

For "[a]ny other alpha emitter," Table 13 of NUREG-1140 gives the level of activity to cause 1 rem of exposure at 100 m as 2 curies. For packaged alpha waste, a factor of 10 is applied in a similar way to that for mixed beta-gamma wastes, leading to screening level for "[p]ackaged waste, alpha" of 20 curies. These are the same levels of activity as are given in Table 7. Once again we question whether the factor of 10 is appropriate for conditions at Radiac.

## **B. Discussion of License Limits for Individual Isotopes**

Referring to the screening levels for individual radionuclides given in Table 7, some are as low as 2 curies and 15 are below 50 curies. To take some examples, iodine-125 and iodine-131, both of which are used for medical purposes, have screening levels

of 10 curies, well within the licensed 50 curie maximum for byproduct and source material. Lead-210, which also has medical uses, has a screening level of 8 curies. Curium-245 and neptunium-237 have screening levels of 2 curies. As far as we can tell, Radiac is licensed to store all of the isotopes mentioned above up to the screening activity level. The language of DOL's July 16, 2003 letter (Exhibit D) could be read to suggest that where mixed isotopes are present in waste, only the 10,000 curie limit is currently applied, without regard to the individual components of that mixed isotope waste. This interpretation would not be at all protective of health and safety because the screening levels for individual isotopes could be exceeded if the activity of the individual components stored is not calculated and only the 50 curie overall limit is applied. The most protective interpretation of the license conditions is that all of the activity of a particular isotope, whether held as a mixture of isotopes or individually, is counted and compared to the limits in Table 7. Even if this interpretation is applied, it is plain from comparing the terms of the license with Table 7 that the two order of magnitude margin of safety referred to by DOL is not provided by the terms of the license, because the screening level for a number of individual radionuclides is less than 50 curies.

### **C. Predicted Effect of Short Term Exposure to Radioactivity**

In NUREG-1140, NRC proposed a criterion of 1 rem effective dose at 100 m as the trigger point for action because EPA recommends considering protective measures from radiation if whole body doses are 1 to 5 rems. *Id.* at 14-16. The 1 rem level is appropriate if "there are no major local constraints in providing protection at that level, especially to sensitive populations (children and pregnant women)." *Id.* at 14. The lower level should be used for this site because families with young children are living less than 50 m from the radioactive waste store. For thyroid doses, the EPA lower limit is 5 rems. *Id.* at iv. Therefore, we believe that if a credible event at the facility could cause a dose that is greater than the lower limit, it should be regarded as having appreciable health and safety consequences.

NUREG-1140 states that a major fire at a radioactive waste store could breach the storage drums and yield the largest releases of the accident scenarios considered. NUREG-1140 at 94-95. We have largely based the following analysis on the predictions of NUREG-1140.

#### **1. The Standardized Approach of NUREG-1140 Predicts Appreciable Health and Safety Impacts**

Comparison of the Radiac license and NUREG-1140 show that we have ample basis for our concerns that the level of radioactivity allowed to be held at Radiac could

lead to harmful levels of radiation exposure. NUREG-1140 quotes a study which showed that a child's thyroid dose due to a major fire at a warehouse facility storing 20 curies of iodine-131 could be up to 40 rem. *Id.* at 95. Using a different method, the report predicted that if 5 curies of iodine-131 are stored, the dose at 100 m resulting from a severe fire at the facility would be 1 rem effective dose equivalent. *Id.* at 79. For most plutonium isotopes, the amount that could cause 1 rem effective dose equivalent at 100 m is 2 curies, for thorium-232 (formerly used in glowing lamp mantles) it is 0.7 curies, and the minimum activity required to deliver such a dose is a mere 0.2 curies for actinium-227. *Id.* at 80. Table 13 of the report lists 26 different radionuclides that could deliver a 1 rem effective dose at 100 m if less than 50 curies of activity is present in the facility.

Table 1 provides a summary of the limits placed on Radiac by the DOL permit and those recommended by NUREG-1140. NUREG-1140 suggests that a restriction such as that in condition 16 does not serve to adequately protect public health and safety for two reasons. First, as discussed below, the unique site specific factors at Radiac (being contiguous to a hazardous waste storage facility and very close to occupied residences and a school) could lead to increased consequences beyond those estimated by the report. Second, the comparison of the limits from Table 13 from NUREG-1140 with those from Table 7 of the of Industrial Code Rule 38, given in Table 1, shows that the radionuclides that cause a 1 rem dose at the lowest activity levels are not listed in Table 7. For example actinium-227 and thorium-232 do not appear in Table 7. This means that Condition 16 does not serve to control the activity level of the most dangerous radioisotopes. In addition, some of the screening levels listed in Table 7 are up to twice as high as those listed in Table 13. For instance, in Table 13, the iodine-131 activity level to cause a 1 rem dose is 5 curies, whereas in Table 7, the screening level is 10 curies. This means that even using the generalized modeling assumptions adopted in NUREG-1140, Radiac is licensed to store levels of activity that could have an appreciable direct health and safety impact in case of fire.

**Table 1 Summary of Similarities and Differences Between DOL Limits and NUREG-1140 Limits**

No. of Curies	Derivation of Limit
10,000	DOL screening level for "packaged mixed waste" NUREG-1140 screening level for "packaged waste, beta gamma"
50	Total amount of waste licensed by DOL to be stored at Radiac (excluding special nuclear material, which is limited by a criticality requirement)
20	DOL and NUREG-1140 limits for "packaged waste alpha"
10	DOL limit for I-125 and I-125
8	DOL and NUREG-1140 limits for Lead-210
7	NUREG-1140 limit for I-125
5	NUREG-1140 limit for I-131
2	DOL and NUREG-1140 limits for Cs-245 and Np-237
2	NUREG-1140 limit for most plutonium isotopes – limited by DOL at Radiac by criticality requirement of <200 grams
0.7	NUREG-1140 limit for thorium-232 (no individual DOL limit for this isotope)
0.2	NUREG-1140 limit for actinium-227 (no individual DOL limit for this isotope)

**2. Exposure Could Be Higher Than Predicted By the Standardized Approach**

A number of factors indicate that the consequences at the facility could be greater than those suggested by NUREG-1140. In translating the amount of activity present into the exposure in the event of an event, when discussing potential releases from fires, the report did not consider the possibility of a radioactive waste store being sited adjacent to a hazardous materials store. See *id.* at 84-85 (discussing the need for a woodframe building, lack of sprinkler system, and ineffective fire fighting for a major fire to occur). The violence of a hazardous waste fire and possible explosions of volatile and explosive material would tend to increase the release fraction. Furthermore, the report states that, except for iodine exposure, doses were calculated for adults and that those for children could be expected to be 2 to 3 times higher. *Id.* at 18-19. This is of particular concern because there is an elementary school playground around 150 m from the facility and children play on the roof of a building adjacent to the radioactive waste store, as shown by the presence of children's trampoline on the roof. See Exhibit B, Photographs 7 & 10. In a worst case scenario, hundreds of children could be playing outside when an event occurs. In addition, there are many residents living closer than 100 m to the building,

some as close as 10 m. While it is difficult to estimate the exposure to such close-in individuals, it is likely that they would receive greater doses than individuals living further away.

**3. Exposure Predicted By Dr. Resnikoff Would Cause a Significant Impact on Health and Safety**

Our belief that the assumptions in NUREG-1140 are not conservative enough is confirmed by a study carried out by Dr. Marvin Resnikoff, a physicist who specializes in nuclear safety, attached as Exhibit K. As can be seen from the study, he modeled a release of 50 curies of iodine-125 from the facility using the computer program AIRDOS. He found that for such a release a person 300 m from the facility would receive a thyroid dose of 28 rems and a person close to the facility would receive at least 10 times that dosage. Reducing the results by a factor of 5 to take account of the restriction imposed by condition 16, that the iodine activity be less than 10 curies, yields a thyroid dose at 300 m that could be over 5 rems and for people close to the facility it could be over 50 rems. Thus, the level of exposure for those close to the facility could be over 10 times the level at which EPA recommends considering precautions.

**D. Long-term Harm to the Community from Radioactive Contamination**

NUREG-1140 only analyzed acute exposure during an accident, because it was designed to help decide whether to require emergency response plans from certain licensees. Without minimizing the effects of short term exposure, it has now become apparent that long term effects could also seriously harm the community. In 1997, EPA determined that the NRC criteria for termination of decommissioning at licensed facilities did not meet the requirements of CERCLA, which require a cancer risk range of one in 10,000 to one in a million. EPA, OSWER Directive 900.4-18, 1 (August 20, 1997). The NRC criteria of 25 millirem effective dose equivalent per year with exceptions allowing up to 100 millirem per year correspond to a lifetime cancer risk of one in 2,000 and one in 500 respectively. Id. Therefore, EPA concluded that a standard of 15 millirems per year, corresponding to a cancer risk of one in 3,333, was the maximum exposure standard that was protective of health, as required by CERCLA. This is the standard that is likely to be applied to a cleanup if radioactivity is released from Radiac. In September 2002, NRC and EPA agreed in a memorandum of understanding that NRC will consult with EPA where the license termination criterion for soil contamination are above certain specified levels. These levels range from 2 picocuries per gram for niobium-94 upwards.

At a meeting of the American Nuclear Society on radiological terrorism, two scientists from Lawrence Livermore National Laboratory evaluated the potential response

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that would be required by the release of a small amount of plutonium, based on the experience of the previous clean-ups that were required after plutonium was released. Harry C. Vantine & Thomas R. Crites, *Relevance of Nuclear Weapons Clean-up Experience to Dirty Bomb Response* (November 19, 2002) available at <http://eed.llnl.gov/ans>. At Rocky Flats, Colorado, release of approximately 3.5 curies of plutonium between 1952 and 1989 resulted in contamination of 500 acres of property. Id. Debate is still ongoing about the appropriate clean-up levels. Id. 15 curies of plutonium-238 were removed from a drainage canal at a plant in Ohio in 1969 at a cost of \$48 million. Id. The authors conclude that the dispersion of even a few curies of plutonium in an urban area may be expected to cost in the order of \$100 million to clean up, if EPA clean-up criteria are applied. Id.

In July, the specialist press has reported on the efforts of a task force that is attempting to set cleanup standards for radioactive contamination in the event of a dirty bomb attack. Geoff Koss, *Administration Struggles to Develop Cleanup Standard for 'Dirty Bombs'*, InsideEPA.com, July 23, 2003. The report refers to experts who state that the effect of a dirty bomb would be primarily psychological and economic, but that even a small bomb would trigger an expensive clean-up. Some scientists believe a clean-up to EPA superfund standards would be prohibitively expensive and technically impractical. Therefore, they fear that contaminated sites in urban areas could be simply closed to humans because the clean-up costs could exceed the property value. Id.

## VII. Violations History

Records of inspections at the radioactive waste store were obtained from DOL. Table 2 provides a summary of the violations notified to Radiac by DOL. Particularly troubling is the December 2000 repeat violation, where a drum was wrongly labeled as causing much lower exposure than was actually the case. The DOL notification letter for this violation is provided as Exhibit L.

The hazardous waste store was cited by OSHA for violating safety standards in September, 2003, as was discussed above. In addition, the hazardous waste operation has accumulated a lengthy history of DEC permit violations. As part of its permit application, Radiac provided a record of compliance in January 2002. It shows that Radiac entered into a consent order with DEC on April 4, 2000 and paid a \$20,000 penalty for storing containers of hazardous waste on damaged pallets, stacking the containers in too many layers, using containers that were in poor condition, failure to properly segregate different waste classifications, failure to give employees the required training, storage of waste for over one year, failure to label waste properly, failure to

record inspections properly, shipping waste to Canada without proper notification, failure to meet RCRA LDR requirements, and other violations.

**Table 2 Summary of Radioactive Material License Violations**

Date of Letter	Date of Inspection	Violation Summary
12/18/2000	12/11/2000	One drum not labeled with generator no. and wrongly labeled 0.5 mr/hr, when exposure was 30 mr/hour. Inspector noted a similar violation was observed earlier in the year
4/6/2000	2/15/2000	Radiac disposed of LLRW in Florida without the required permit
12/16/1994	12/15/1994	No record of the Emergency Contingency Plan drill
11/26/1993	11/12/1993	Minutes of Radiation Safety Committee were not available for inspection
12/8/1992	11/17/1992 & 12/4/1992	Cs-137 source improperly stored, failure to investigate abnormal exposure readings for an employee
9/13/1991	8/15/1991 & 8/11/91	Calibration data for liquid scintillator not seen and 90 microcurie source not covered by permit

An EPA inspection on June 17, 1999 found that two drums containing poisons were misplaced in the flammable area and emergency equipment was not tested. An internal DEC memorandum describing an inspection on March 3, 1999 identified two high priority violations: stacking waste drums too high; and not separating containers of incompatible wastes properly (repeat violation). In addition, the memo identified six medium priority violations, including: modifying daily and weekly inspection logs without authorization; failure to provide training records; storing drums on damaged wooden pallets which may collapse and cause the drum to rupture or leak. The memo stated that the facility should be treated as a Significant Non-Complier.

On July 23, 1998 Radiac was fined \$42,000 for failing to keep proper records. Two officers and directors of the company, Arthur F. Green and John V. Tekin, were fined \$1,000 each for forging training records to show employees had received training, when in fact they had not. In a fact sheet dated July 22, 1999, EPA characterized these offenses as criminal conduct.

On March 5, 1997, Radiac entered into a consent order with EPA that levied a penalty of \$12,100 for violations including: failure to test and maintain emergency

equipment; missing emergency equipment; stacking containers of hazardous waste too high; and failure to produce training records when requested at an inspection. In addition, the record of compliance shows various penalties and warnings for transportation violations in New Jersey, Pennsylvania and Ohio from 1999 to 2001.

### VIII. Radioactive Waste Throughput and Origin

Each year, DEC reports on Radioactive Waste Transportation in New York. The data in these reports shows that the volume and activity of waste handled at Radiac has varied considerably from year to year from a low of 5.11 curies in 1997 to a high of 255 curies in 1998. While in most years, the amount of waste in the store probably remains well below the 50 curie limit, in 1998 the 50 curie limit may well have been approached.

Except for 1998, two New York based radioactive waste brokers were in operation from 1997 to 2001. In addition, two waste brokers from outside of New York have been consistently collecting waste in New York since 1997. One of the out of state brokers services mainly universities and hospitals. As can be seen from Table 3, in most years around half of the waste volume and most of the activity handled by the two New York brokers originates from outside of New York. In 1998, Radiac was the only New York State broker operating and 99.8% of its activity came from out of state. Of the 255 curies that Radiac collected in 1998, 254.347 curies came from New Jersey. In the same year, other out of state waste came to Radiac from Massachusetts, Pennsylvania, Connecticut and Ohio.

**Table 3 Radioactive Waste Origin for Both New York Brokers**

Year	% Non NY Waste in Waste Handled by NY Brokers (by volume)	% Non NY Waste in Waste Handled by NY Brokers (by activity)
1997	50.0	17.5
1998*	35.2	99.8
1999	28.3	6.1
2000	46.0	64.5
2001	47.5	73.6

\* Radiac was the only New York broker that operated in 1998.

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## IX. Conclusion

A major event at Radiac could cause the release of a significant amount of activity of mixed isotopes, including alpha emitters. The effect could be comparable to that of a small dirty bomb. In the short term, such an event could cause panic, expose some individuals to greater than recommended levels of radioactivity, and contaminate a large area with radiation. In the long run, large areas could need to be either cleaned up or abandoned. Obviously, such an event could have devastating effects on members of the community around Radiac.

According to DOJ, there is a credible risk of a terrorist attack at a hazardous chemical storage facility. The poor security, location in a densely populated area of New York City close to lower Manhattan, ease with which a major conflagration could be caused, and the potentially serious consequences make this facility particularly attractive to terrorists and vulnerable to attack. In addition, the chance of an accident at the facility is orders of magnitude greater than one-in-a-million per year and is worryingly credible. Because the radioactive waste store is impossible to secure effectively, we believe it should be closed before this vulnerability is exploited. While it is impossible to know when an attack could occur, we believe there is a need for urgent action, before knowledge of this vulnerability spreads to those with hostile intent. We therefore urge NRC to close this facility as a matter of urgency.

We would be pleased to provide any further documentation and or citations that may be required. Thank you for your consideration of this matter.

Sincerely,

Michael B. Gerrard

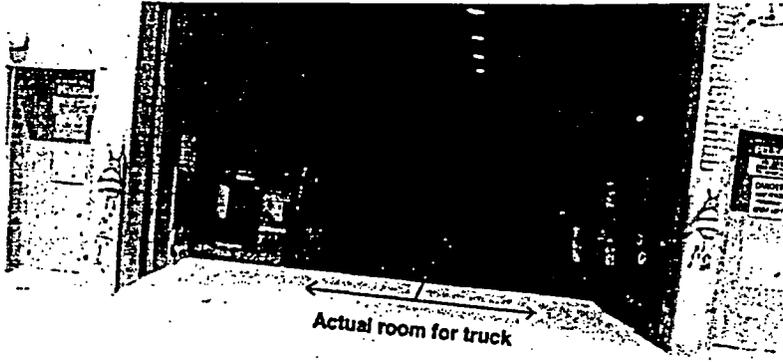
## Enclosures

c.c. Hon. Linda Angello, Commissioner,  
New York State Department of Labor  
Hon. Erin Crotty, Commissioner,  
New York State Department of Environmental Conservation  
Thomas West, Counsel for Radiac Research Inc.

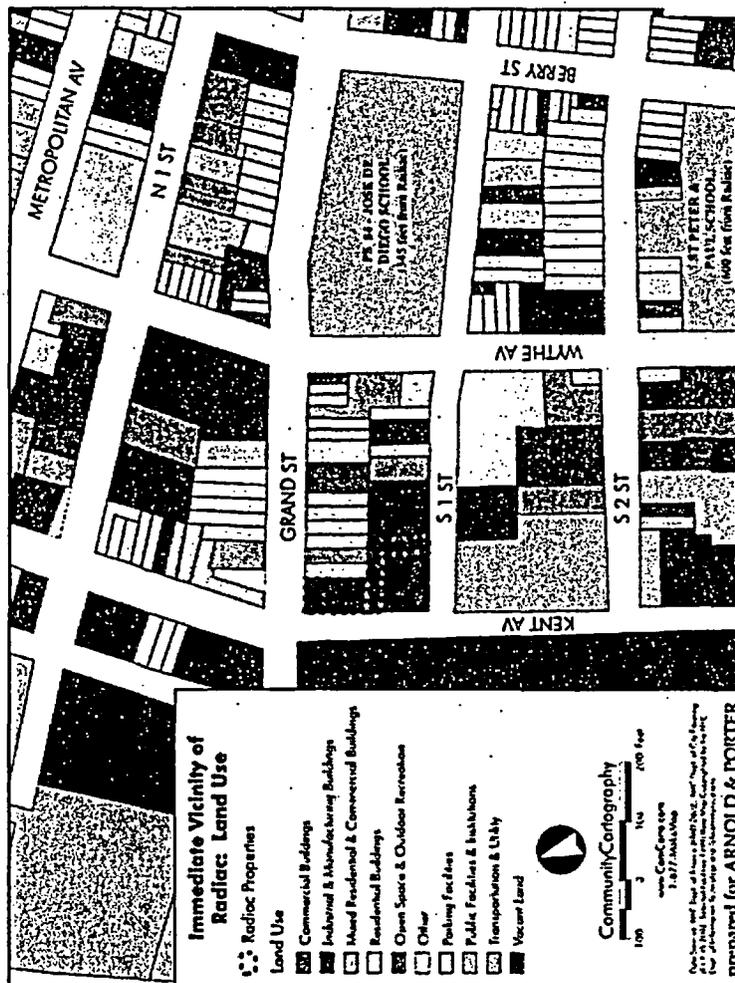
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b.c.c. Charles Cox, NRC

**ATTACHMENTS - RADIAC RESEARCH CORPORATION FACILITY**

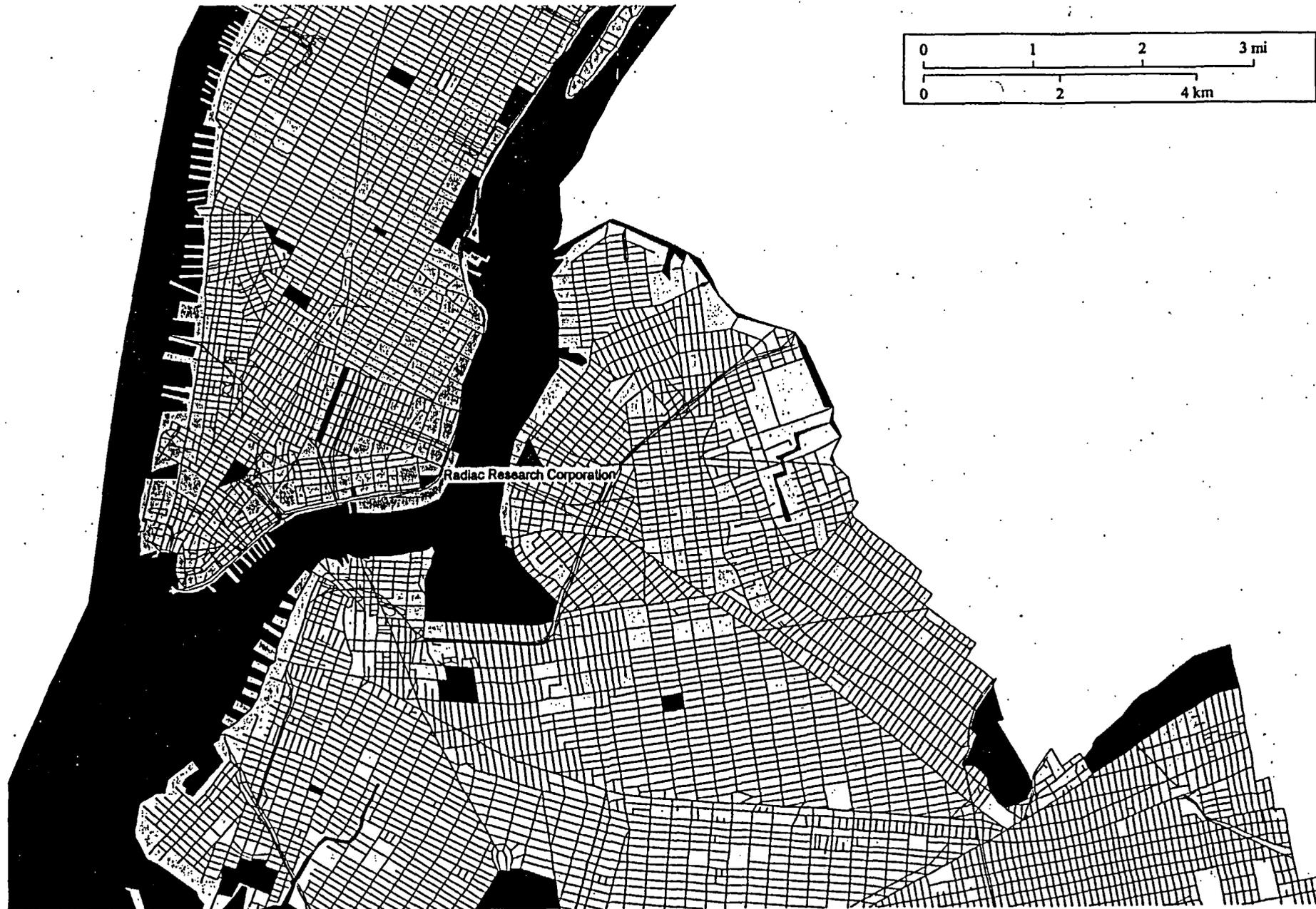


Radiac Chemical Waste Facility - 33 South 1st St. (fall 2003)  
 Note: - Extremely tight conditions for trucks backing in  
 - Height of stacked containers

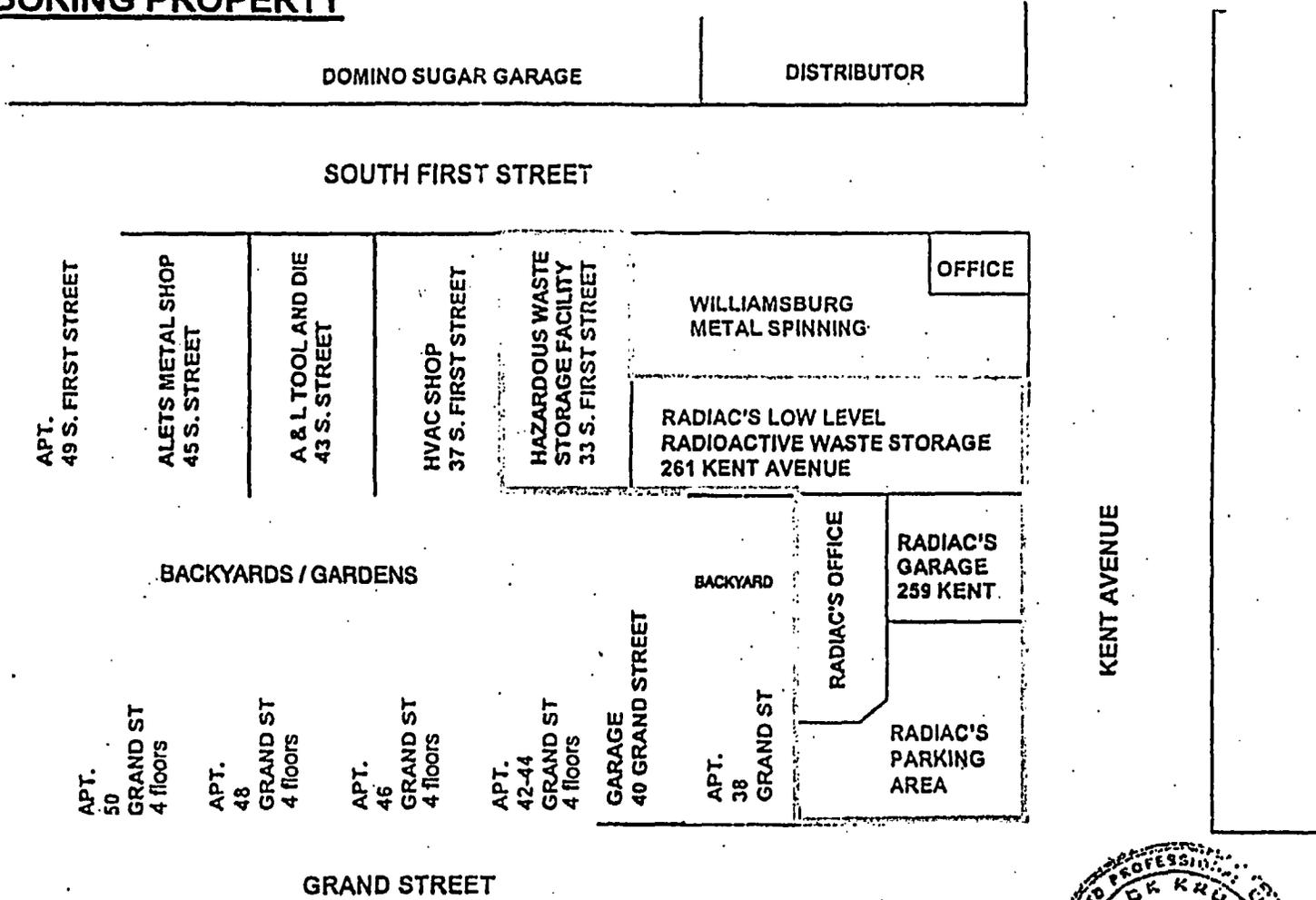
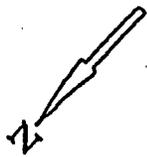




MARPLOT



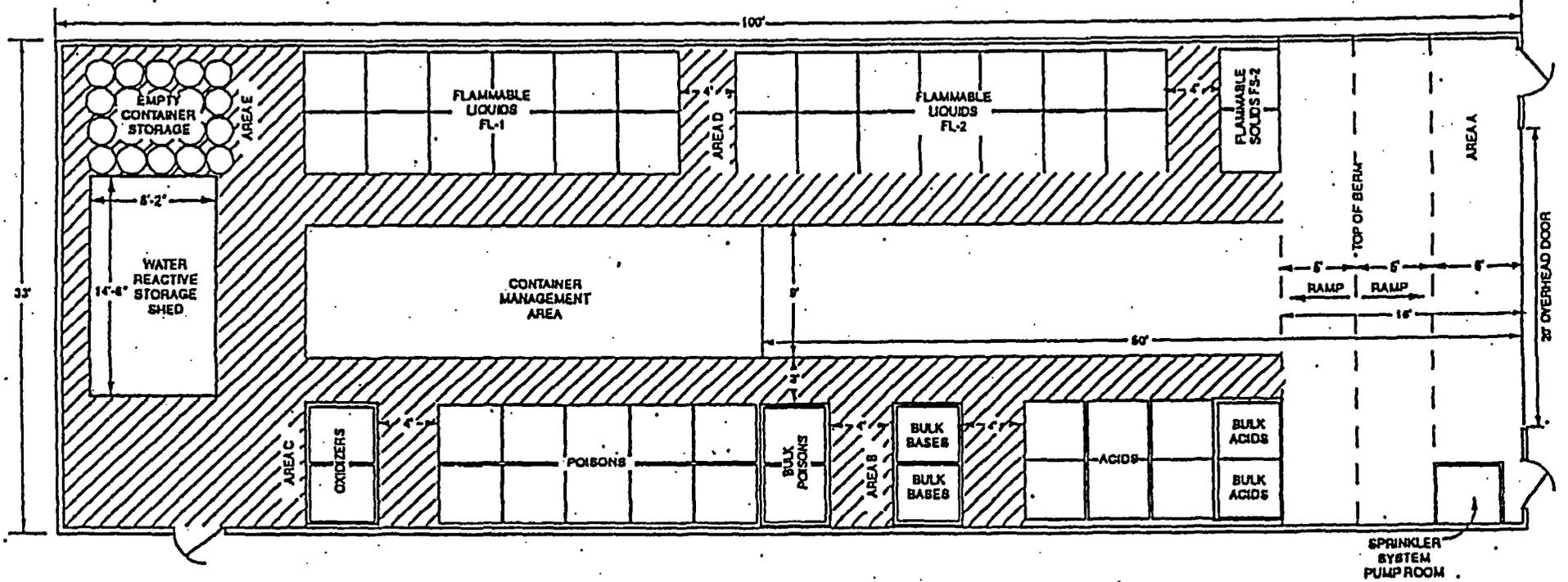
# RADIAC FACILITY'S NEIGHBORING PROPERTY



- APT. 2 FLOORS 49 GRAND ST.
- APT. 4 FLOORS 47 GRAND ST.
- APT. 3 FLOORS 45 GRAND ST.
- APT. 3 FLOORS 43 GRAND ST.
- COMMERCIAL 1 FLOOR 39 GRAND ST.
- MIXED USE 1 FLOOR
- COM. 1 FLOOR APT. 1 FLOOR



*Jack Krueger*



AREA A

- SCBA
- FIRE EXTINGUISHER (20LB)
- EYEWASH
- INTERCOM SYSTEM
- EXPLOSION PROOF PUMP
- ADT FIRE ALARM
- EMERGENCY CALL BUTTON
- FIRE EXT. (250LB)

AREA B

- FIRE EXTINGUISHER (20LB)
- EYEWASH
- FIRST AID KIT

AREA C

- ADT FIRE ALARM
- EMERGENCY CALL BUTTON
- SAFETY GLASSES
- TOOLS
- PROTECTIVE CLOTHING
- RESPIRATORS
- FIRE EXT. (250 LB)

AREA D

- EXPLOSION METER

AREA E

- RECOVERY DRUMS

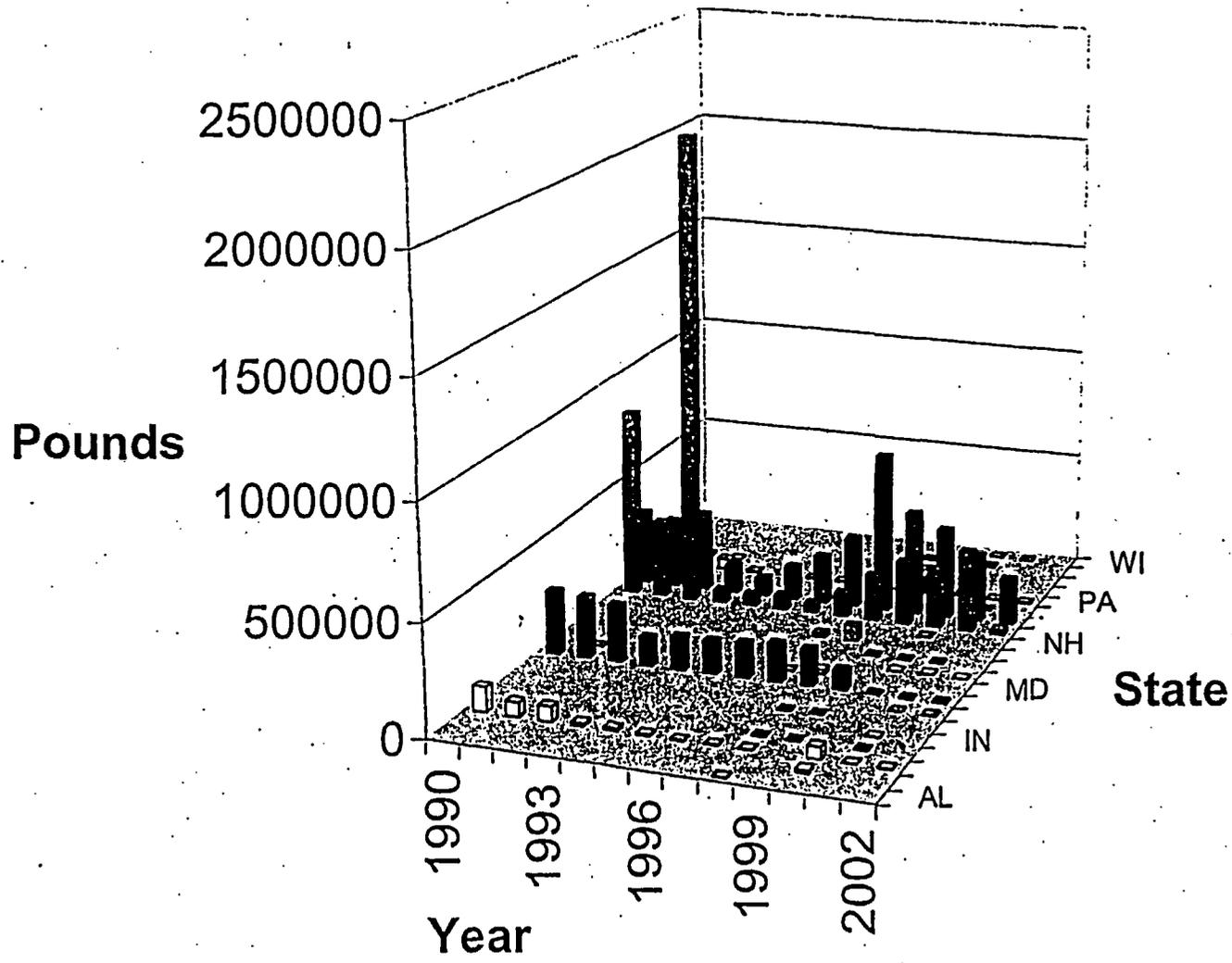
Exhibit G-1  
LOCATION OF  
EMERGENCY EQUIPMENT



# Examples of Permitted Chemicals

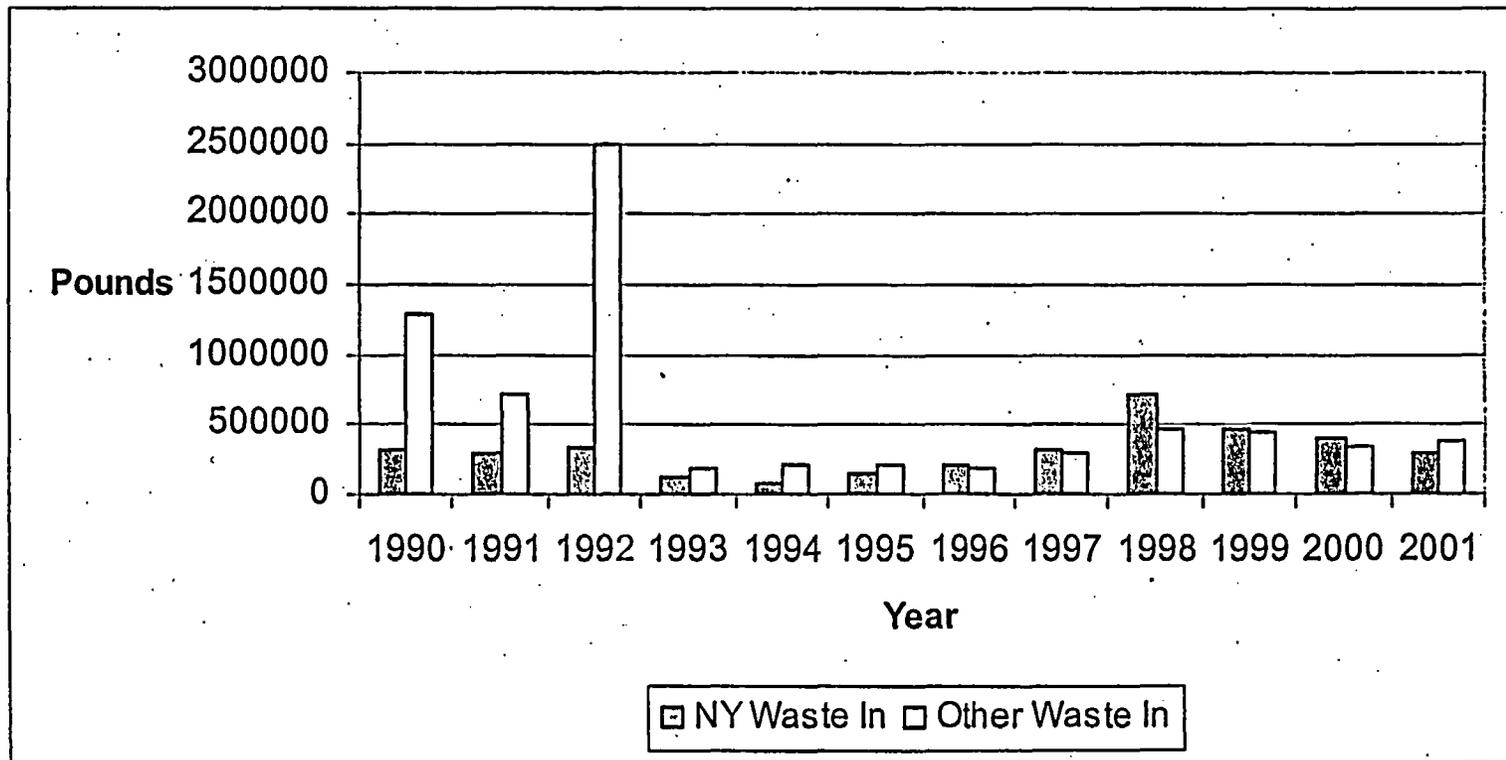
Waste Code	Chemical Name	Property (ref: Dangerous property of Industrial Materials-Fifth Edition, N. Irving Sax)
P017	Bromoacetone	Powerful lacrimator. A chemical warfare agent
P028	Chloromethyl benzene	Toxic and ignitable
P031	Cyanogen (gas)	Fire Hazard Very dangerous. When heated or contact with water decomposes to produce highly toxic fumes
P033	Cyanogen chloride	When heated or contact with water decomposes to produce highly toxic fumes.
P038	Diethyl Arsine	Spontaneous flame in air. Extremely toxic
P076	Nitric Oxide	A poisonous gas. Dangerous. When heated to decompose, emits highly toxic fumes
P078	Nitrogen Oxide	A poison gas. Dangerous. When heated to decompose, emits highly toxic fumes. Violent reaction with organics
P089	Parathion	Highly dangerous. When heated to decompose, emits highly toxic fumes.
P095	Phosgene	Highly toxic. 50 ppm in the air is rapidly fatal after even short exposure.
U249	Zinc Phosphide	It reacts violently with acids or acid fumes to emit highly toxic and flammable phosphine.

# Hazardous Waste Origin

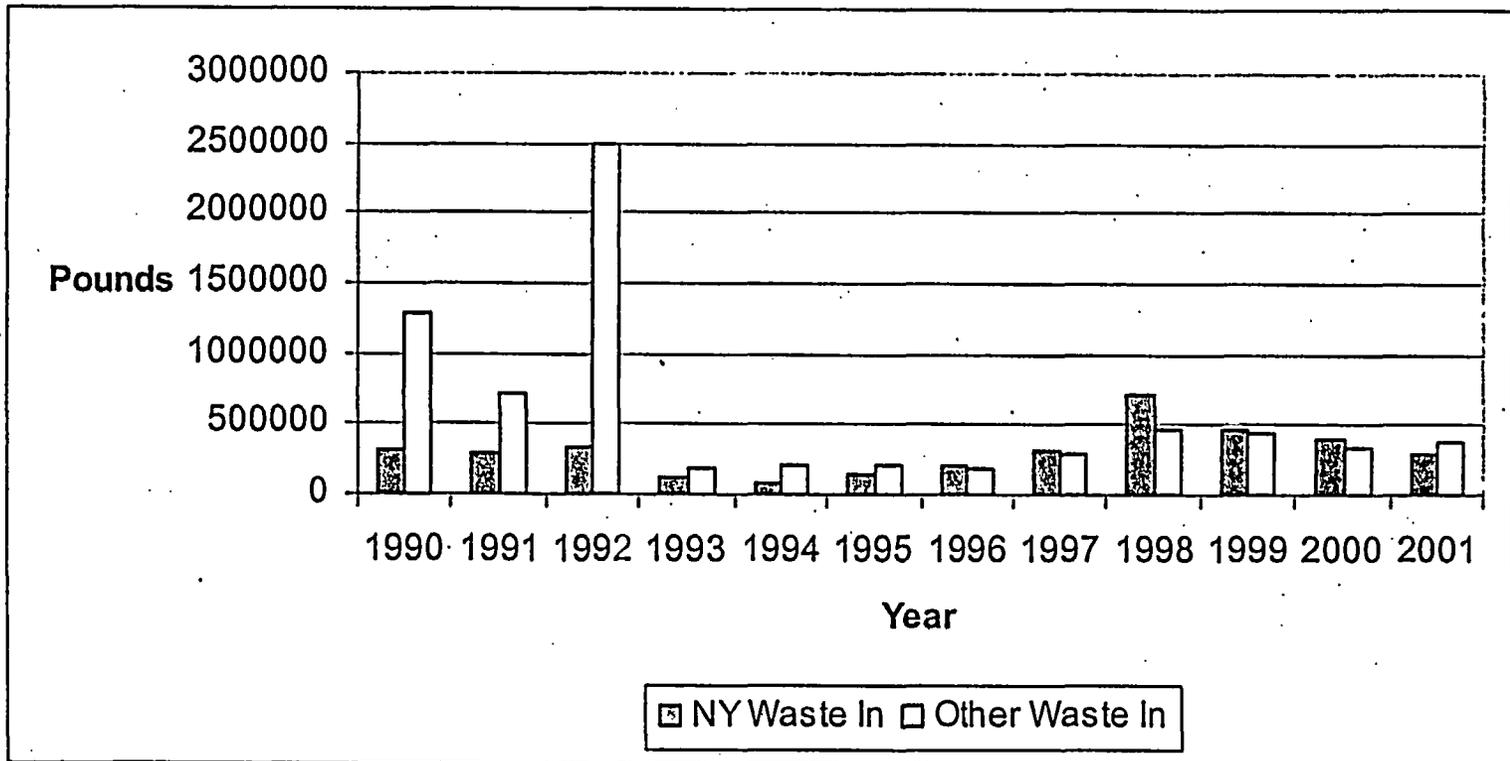


- AL CA CT FL IN KS KY MA MD MI MN
- MO NH NJ NY OH PA RI TX VA WI

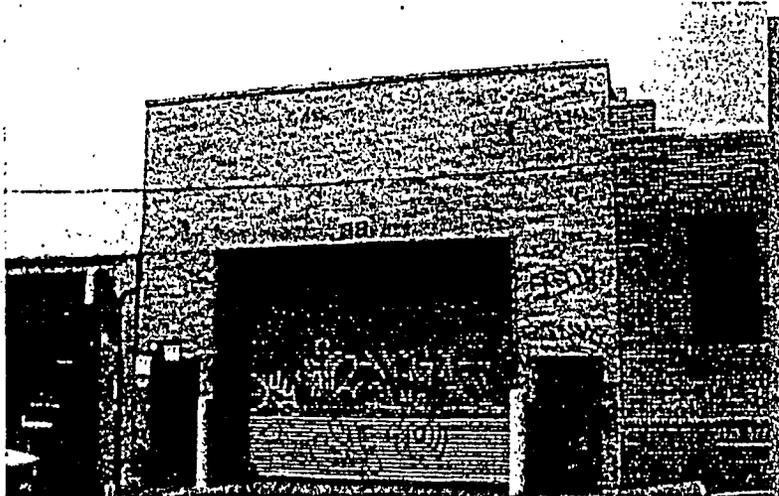
# New York vs. Other Waste



# New York vs. Other Waste



1



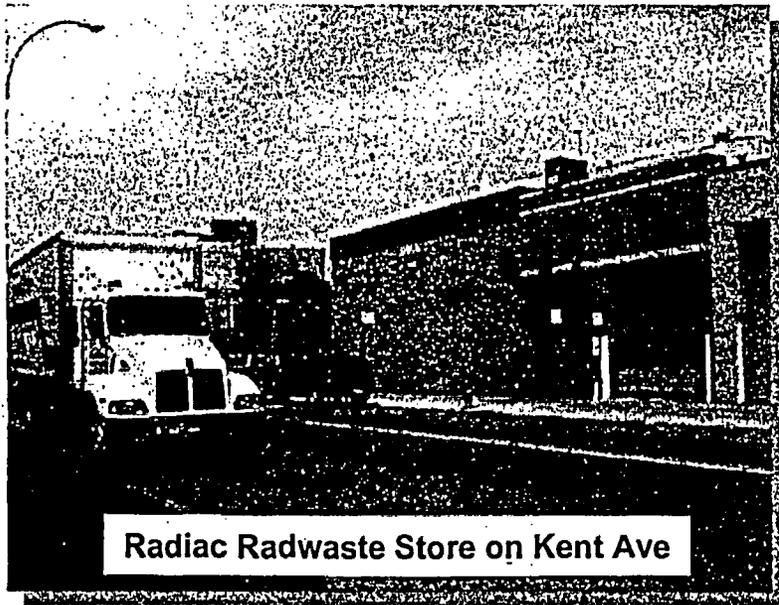
Front of Radiac Waste Store - 33 South 1st St.

2



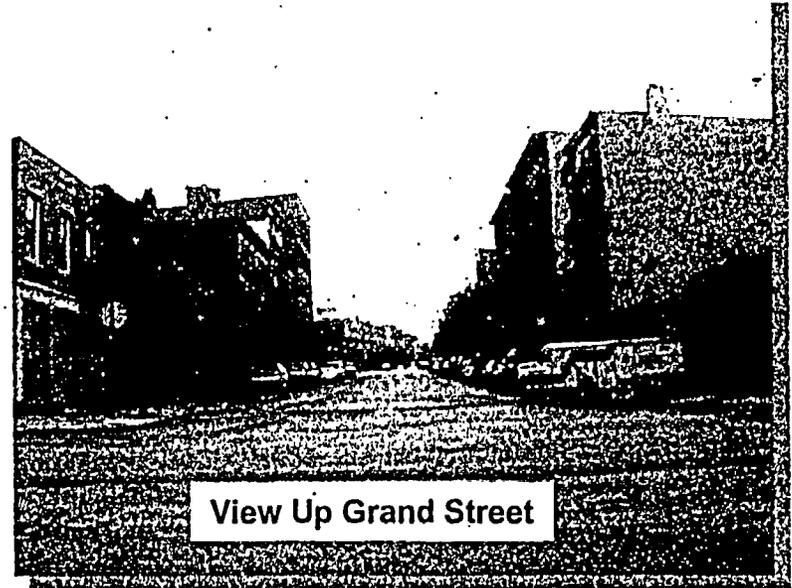
View Up South First Street

3



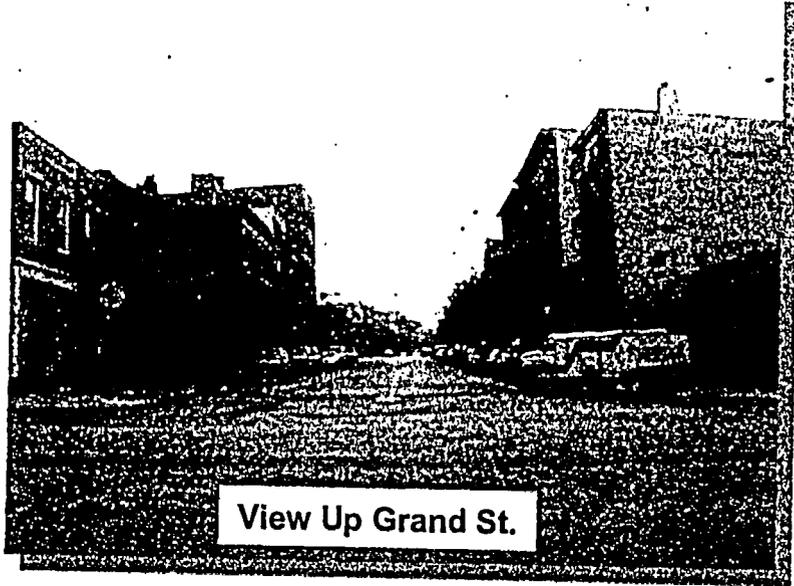
Radiac Radwaste Store on Kent Ave

4



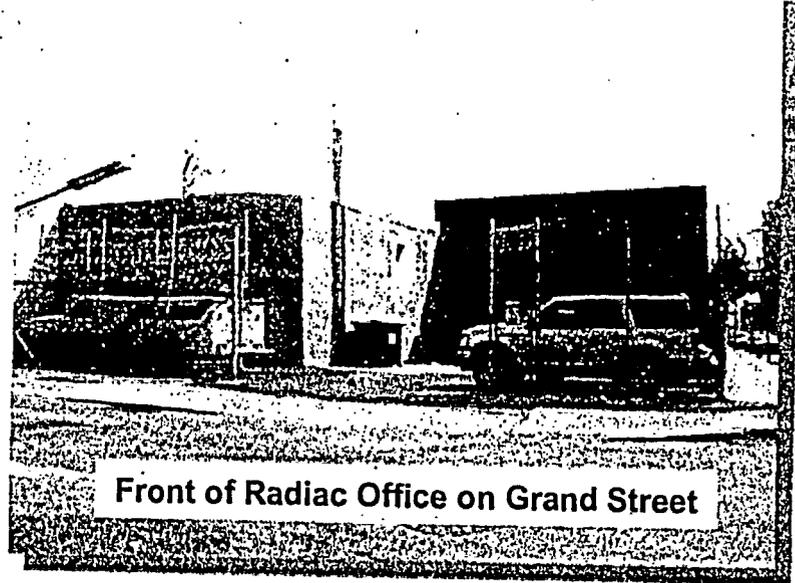
View Up Grand Street

5



View Up Grand St.

6



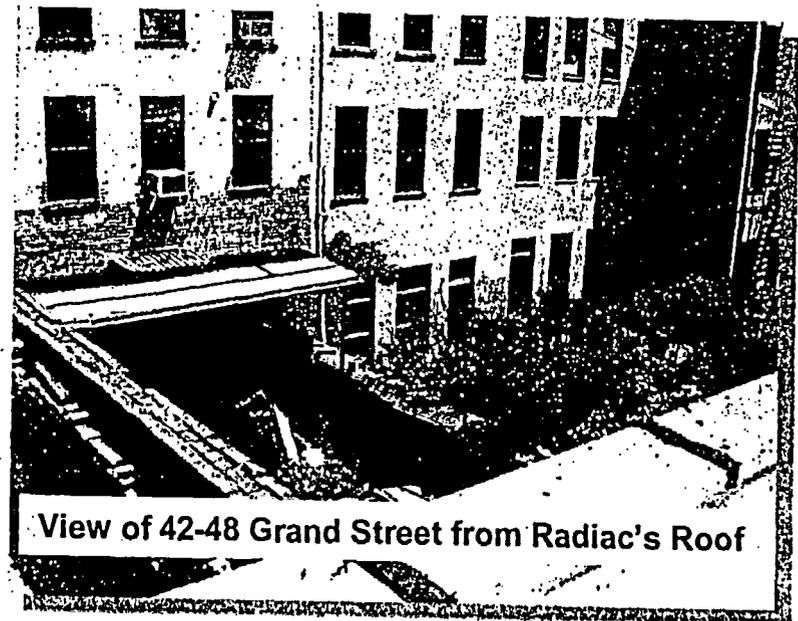
Front of Radiac Office on Grand Street

7



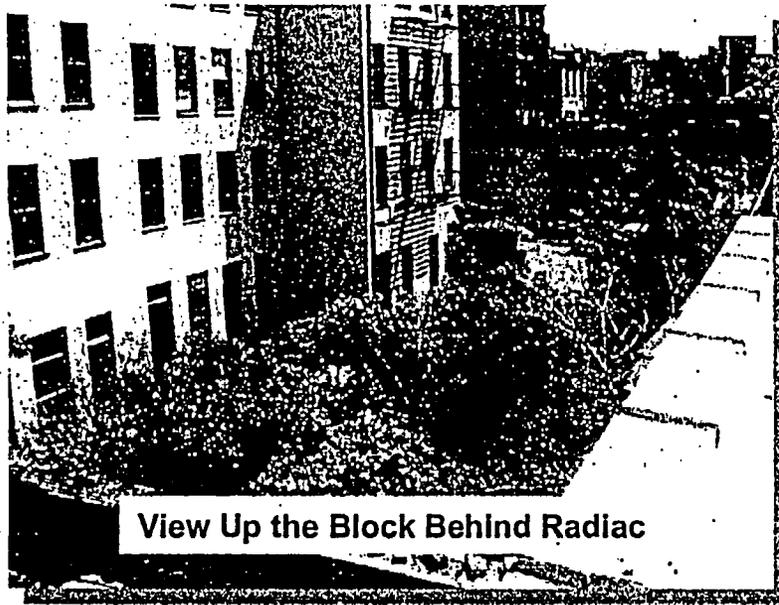
Views of 42-44 Grand St. From Radiac's Roof

8



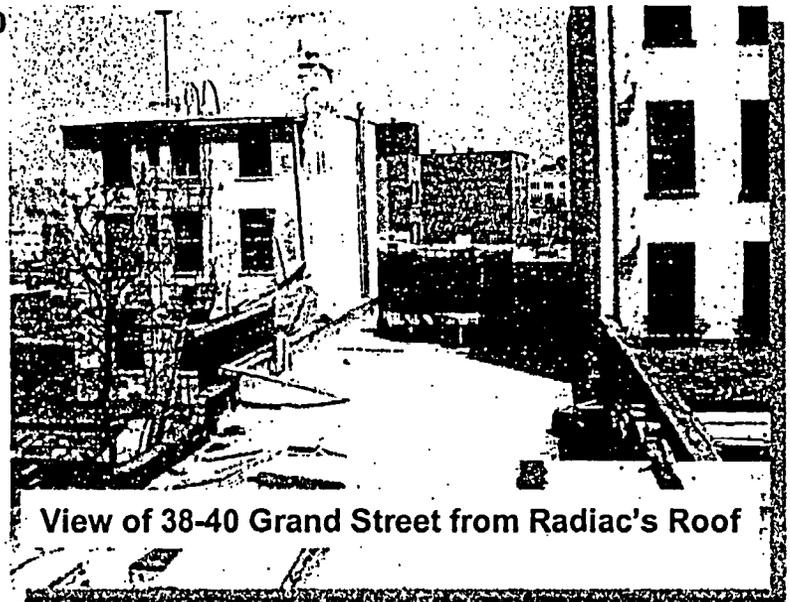
View of 42-48 Grand Street from Radiac's Roof

9



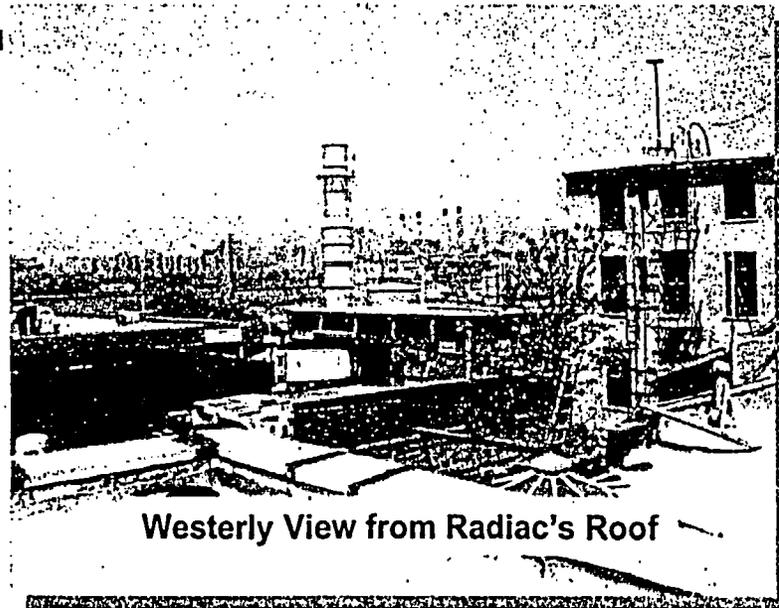
**View Up the Block Behind Radiac**

10



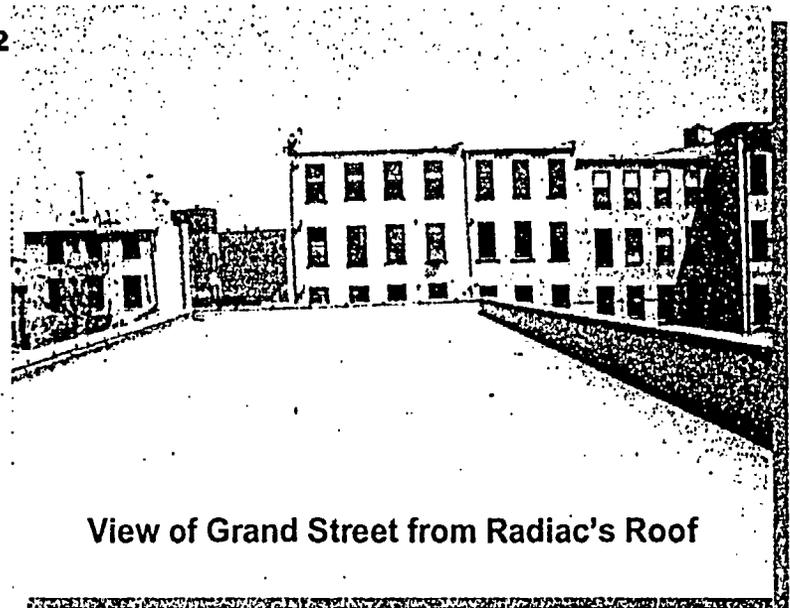
**View of 38-40 Grand Street from Radiac's Roof**

11



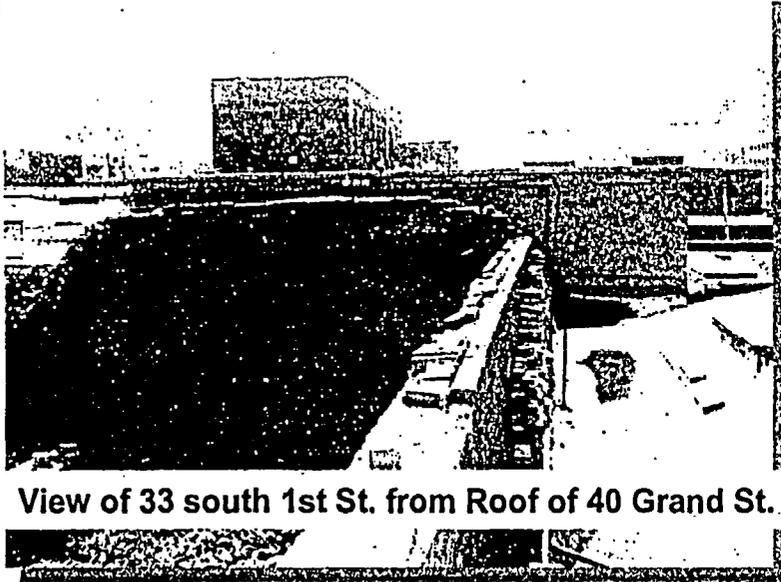
**Westerly View from Radiac's Roof**

12



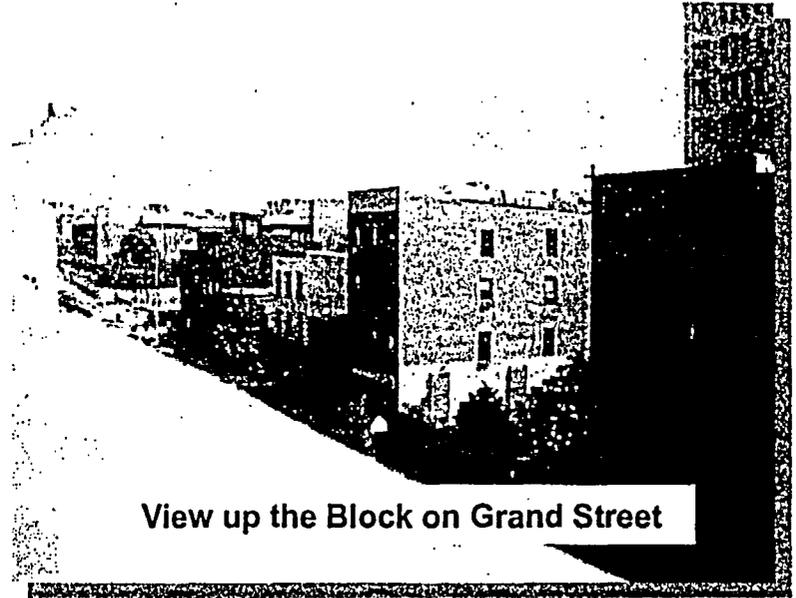
**View of Grand Street from Radiac's Roof**

13



View of 33 south 1st St. from Roof of 40 Grand St.

14



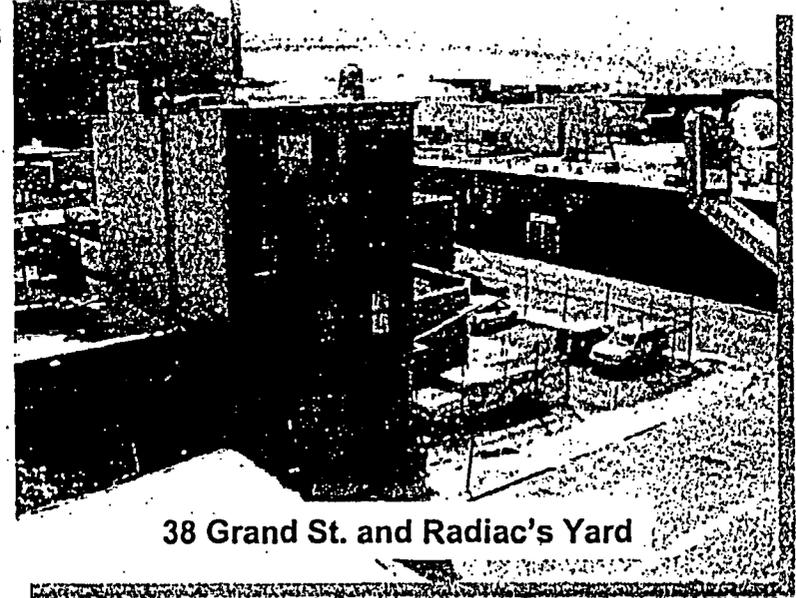
View up the Block on Grand Street

15

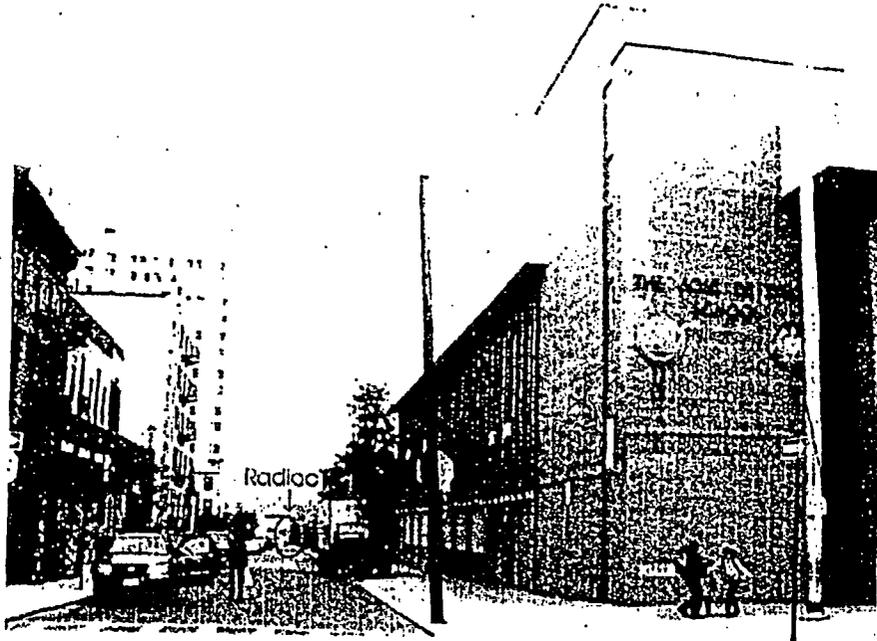


40-46 Grand St. (Radiac at Rear)

16



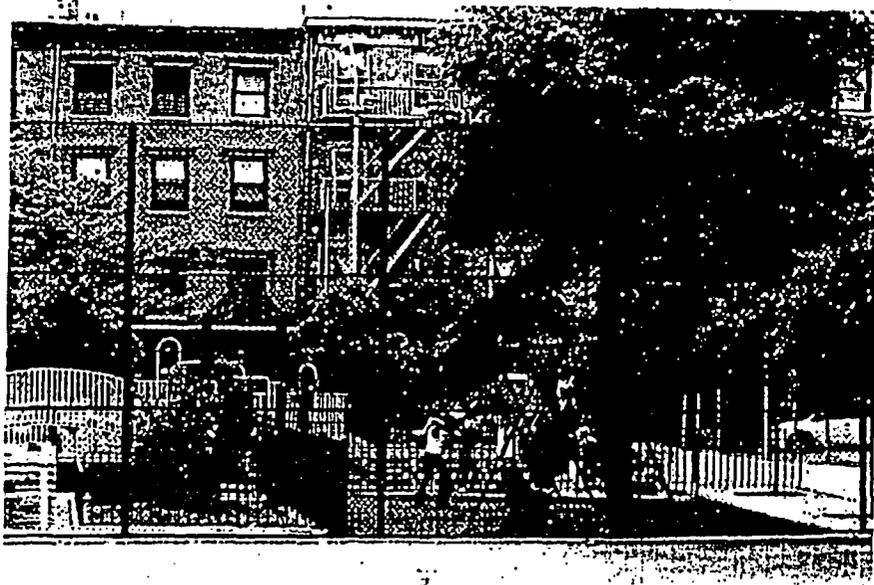
38 Grand St. and Radiac's Yard



Jose de Diego Grade School - Radiac is on the next block



Sheridan Playground - adjacent to Jose de Diego school



Jose de Diego playground and Sheridan park



Jose de Diego school - 1100 grade schoolers