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UST 201

Nov. 29, 1985

The Chemical and Nuclear Waste of  
the Lake Ontario Ordnance Works Site

The Niagara Falls Storage Site (NFSS), previously part of the 7500 acre Lake Ontario Ordnance Works (LOOW), is located in the towns of Porter and Lewiston in Western, New York about 8 miles north of Love Canal. The current Department of Energy (DOE) site is a 190 acre plot.

This area has had a varied history of use or misuse by the federal government since the fall of 1942 to the present date. The history starts with the Army and their TNT (trinitrotoluene) plant.

In the fall of 1942 the Army acquired 7,567 acres by condemnation from 149 private landowners. Most of the 125 farmhouses and 538 barns were burned or demolished to make way for the construction of the TNT plant.<sup>1</sup> This site was designated Lake Ontario Ordnance Works. The oxidation of ammonia and production of sodium sulfite intermediates also occurred at the plant.<sup>2</sup> The choice of this particular area for the site was because of "abundant water and cheap power, access to rail and proximity to an urban labor market".<sup>3</sup> There were also disadvantages to the site. The terrain and climate not only delayed construction time tables, but would later be an important factor in terms of environmental hazards.<sup>4</sup> There were harsh winters and flooding in the spring. Poor soil conditions were also present in the area. This plant ceased operation in July, 1943 after

an expense of approximately \$ 27 million, "there was a gross overestimation of TNT need".<sup>5</sup>

The Air Force base #38 which is north of Balmer Road on the LOOW site has also been operated beginning in 1942. Bell Aerospace has been contracted for the operation of the base that produces rocket propulsion hardware and lasers.<sup>6</sup>

The Chemical Warfare Services (CWS) began operation on 1,100 acres on the LOOW site formally in June of 1944 as the Northeast Chemical Warfare Depot.<sup>7</sup> In February of 1944 the Manhattan Engineering District (MED), the Army unit responsible for the Manhattan Project, was granted use of a large concrete resevoir and the 25 surrounding acres of LOOW.<sup>8</sup>

The CWS used the Depot as a regional storage place of incendiary and napalm bombs, high explosives, aluminum scrap and impregnite.<sup>9</sup> This was an ideal site because "1) there were already 58 pre-existing "igloo" buildings (previously used for the stockpiling of TNT munitions) which could be used for storage with out additional construction 2) it was close to the points of production and shipment, and 3) it had been built with excellent rail facilities".<sup>10</sup>

MED used their site to store radioactive sludges (known as L-30 and L-50) generated from the uranium ore refining process at the Linde Air Products "Ceramics Plant" in Tonawanda. "The location was convenient and its selection expedient. It was only a few miles from the Linde Plant and relatively isolated and secure."<sup>11</sup> This choice was made by availability rather than suitability. The site was ill-suited because of "poor drainage and significant levels of precipitation".<sup>12</sup> The area surrounding the site was offered for public sale after the end of the war and 5,206 acres,



the so called security area, was disposed of to private individuals. The remaining 2,326 acres (excluding the MED land) was declared Army surplus, but no one wanted to buy it, so the Atomic Energy Commission (AEC) requested and received permission to use the entire LOOW tract remaining.<sup>13</sup> The Army radically expanded AEC (was the MED) operations onto the remaining site. This area encompassed the area previously used as a TNT plant and the Depot for the CWS.

This expanded AEC site became one of "AEC's principle storage areas on the East coast".<sup>14</sup> Various wastes and contaminated equipment from wartime plants were stored and/or buried at the site. The AEC transferred most of this land back to the U. S. General Services Administration (GSA) in the early 1950's as surplus.

Between 1953 and 1954, AEC contracted with Hooker Electrochemical to build and operate a Boron Isotope Separation Plant at LOOW, at a construction cost of \$5 million. It was operated until 1958 then put on standby until 1964. It was started up again until 1971 and then placed on standby in 1974, the status in which it remains today.<sup>15</sup>

In 1955 the Navy obtained 360 acres and the Air Force obtained 200 acres from the GSA. These parcels included the TNT plant area. The Air Force acquired the Navy area when it took over the joint Air Force/Navy project which involved the manufacture of high energy fuel (alkylated decaborane that contains hydrogen and boron).<sup>16</sup> This was Air Force Plant #68, a \$45 million plant with 79 structures constructed by Olin Mathieson. The pilot plant was closed in 1959 before the main plant was even completed.<sup>17</sup> In 1966 this site and other AEC property was declared surplus. "Part of this, including the TNT plant was sold to a real estate syndicate,

the Frank Conti Corp. for \$97,580 and other private owners. In 1972 and 1976 Frank Conti sold this to Chem-Trol Pollution Services for \$534,000. Chem-Trol's successor, the Services Corporation of America (SCA) presently operates a chemical waste treatment and disposal plant on site."<sup>18</sup>

" In 1955, part of the "igloo area" from the original TNT plant was required by the Army and used for the consolidation of liquid fuel components for Nike-Ajax rockets and for incineration and detonation of conventional munitions and explosives."<sup>19</sup> Part of this site was used for Nike Battery NF-03, used to defend the Niagara Hydroelectric Power Project. This site was deemed obsolete and decommissioned in September of 1964.<sup>20</sup> When this site as well as other Nike-Ajax sites in the area were decommissioned, the liquid contents of the Ajax rockets were shipped to the igloo area for consolidation and later shipped out primarily to the Edgewood Arsenal in Maryland.<sup>21</sup> The igloo area "disposal site was also used for destruction of miscellaneous munitions and other devices by burning and detonation until 1969".<sup>22</sup>

In 1965, 98 acres of the missile site were transferred to the Air Force for the construction of the Youngstown Test Annex. A nearby 126 acre plot in the southern part of the former AEC site, became the Ransomville Test Annex.<sup>23</sup> These bases were part of a defense communications range. The Ransomville site was closed in 1976 and the Youngstown site is still open.<sup>24</sup> The Air Force presently owns 871 acres north of Balmer Road. The Air Force and Army National Guard utilize the site, on which the igloos are located, for training and equipment and munitions storage.<sup>25</sup>

The DOE presently occupies 190 acres of the previous AEC (LOOW) site. It is an area designated as the Niagara Falls Storage Site. It is on

this site that the radioactive waste from the Manhattan Project and other operations are still stored or buried.<sup>26</sup> This site was managed for DOE by National Lead Company of Ohio and is managed presently by Bechtel National Inc. of Oak Ridge.

Most of the above owners have contaminated the land at the LOOW site but few have made a real effort to decontaminate it after their use of the land. They either made futile efforts to clean up <sup>(of)</sup> ignored the fact of the lands contamination. I will now discuss the kind, amount, danger and location of the wastes produced by the Department of Defense (DOD) including the Army, Air Force and the Navy, and wastes generated by the DOE and their clean up efforts as a result of the wastes.

Starting with the Army TNT plant. There was a resulting contamination of part of the "plant's surface area and a vast underground network of waste lines with TNT wastes and residues".<sup>27</sup> These wastes were "low grade TNT, TNT contaminated refuse, waste acid and a sulfonated unsymmetrical TNT by-product".<sup>28</sup>

TNT contaminated wastes were burned at the site and unknown quantities of nitric and sulfuric waste acids were neutralized and discharged to the sewer. 130,000 gallons of TNT wash waters and red waters (containing organic by-products and acidic and toxic effluents that contained TNT particles and other residues) were discharged daily to a surface drainage ditch that led to Four Mile Creek and eventually to Lake Ontario.<sup>29</sup> These wastes were diluted with "sufficient quantities of water to reduce color and eliminate toxic effects".<sup>30</sup>

In a 1948 appraisal by a private consultant, the "ground surface area and drainage ditches were contaminated, buildings and equipment had

been improperly decontaminated and underground waste and sewer lines at the plant were contaminated".<sup>31</sup> They said that 100% decontamination in the concentrated manufacturing areas <sup>was impossible</sup> and that particularly the lower sections of each of the TNT areas should be condemned for future use and fenced and posted accordingly.<sup>32</sup> Some possible hazards they noted were: " danger of detonation by impact against surface TNT or isomers by any vehicle, tool or shoe; danger of fire from cigarette, match or spark; danger of inexperienced person or youth picking up an accumulated quantity of explosive; danger of detonation when digging a well, post holes, foundation or possibly when plowing; danger of fire or explosion resulting from spontaneous combustion; danger of detonation when dismantling buildings; possibility of detonation of materials shipped from the plant."<sup>33</sup>

"Part of this site is used by SCA Chemical Waste Services as a chemical waste treatment facility, and even the slightest possibility of explosion or fire from TNT or residual wastes is of grave concern."<sup>34</sup>

The Army operation of the Northeast Chemical Depot may have resulted in excess impregnite present on site. It is not known where the excess impregnite went after the war ended. It may have gone into Love Canal or possibly had been buried, burned or spread on the ground surface of the LOOW site.<sup>35</sup>

As for the Nike-Ajax sites there is no evidence indicating that solid waste disposal resulted from their activities but the site was used for destruction and detonation of munitions.

The Air Force was involved on the LOOW site with <sup>Two</sup> (to) plants (#38 and #68) and two test sites. There was no waste generation at the Youngstown Test Annex and the disposal activities from plant #38 were New York State approved.

Plant #38 incinerated waste propellants and flash fluids (isopropanol,  $N_2H_4$ , UDMH, MMH and other flammable liquids) at the site. "Black powder explosives are detonated by the New York Army National Guard in an on-site detonation area. Other combustible wastes were hauled off-site by private contractors."<sup>36</sup>

The wastes produced at Plant #68 were mostly lithium chloride and potassium chloride. Thirteen tons of lithium chloride and 14.6 tons of potassium chloride were buried on-site in a disposal pit along with an additional 8 tons of lithium chloride contaminated with kerosene, water, oil and process residuals.<sup>37</sup> "Dispersion slurry oil (14,000 gallons) and lithium hydride (4.1 tons) were incinerated on-site. Salt contaminated with 20,000 gallons of methanol and 25 tons of lithium chloride is buried next to the lithium chloride and potassium chloride pits. Miscellaneous decontamination solutions and small amounts of other unspecified chemicals were also buried on-site. Finally, according to Olin records, there were burning pits at this site used for off-specification borane compounds and other combustible wastes. The residue in the pits was covered over when the burning operation ceased."<sup>38</sup>

The Navy was involved on the facility of Air Force plant #68. They have no records of disposal and simply state that they believe Olin had "diluted boron wastes with water and discharged them into the Niagara River".<sup>39</sup>

"The use of part of the ill-suited LOOW site by the DOE and its predecessors has resulted in significant radioactive contamination on and off the federally owned site."<sup>40</sup> Radioactive wastes were dumped in "open and often unmapped pits, rusty barrels along roadsides, and in inadequate structures originally

designed for different purposes".<sup>41</sup>

The MED was initially granted the permit of use of the land on the condition that future use of the concrete reservoir would not be impaired for the storage of water.<sup>42</sup> This condition was not kept. The reservoir and the surrounding area was irreversibly contaminated. There was also slight contamination in the surrounding area then owned by the Army.<sup>43</sup>

This area then called the Lake Ontario Storage Area (LOSA) Started receiving radioactive materials in early 1944. The L-30 and L-50 wastes from Tonawanda came first.<sup>44</sup> These were the property of African Metals (Afrimet), the ore came from the Belgian Congo in Africa and was stored here as part of an agreement we had with them. A total of more than 18,000 tons of waste was brought to this site before the end of the war and still remains there.<sup>45</sup> Afrimet owns 8227 tons of L-30 stored in building 411 and 1878 tons of L-50 in buildings 413 and 414. The DOE owns 8325 tons of R-10 stored outdoors along with 150 tons of R-10 iron cake also stored outdoors.<sup>46</sup> The R-10 piles were left uncovered until 1964 when they were covered and seeded. The R-10 piles contained 21,415 pounds of uranium oxide ( $U_3O_8$ ). The first floor of building 410 contains 2941 pounds of  $U_3O_8$  in pitchblende ore residues and on the second floor 175 lbs of  $U_3O_8$  in 2 tons of sand in an open pit.<sup>47</sup> These residues are DOE owned. Afrimet also owns 55,756 lbs of  $U_3O_8$  contained in processing residues and 2 lbs of radium-226 in building 434.<sup>48</sup>

During the late 1940's to the early 1950's the LOOW site became a principle depository for radioactive waste from the eastern U.S. F-32 wastes came first from Middlesex, N.J. -nearly 1400 barrels in 1949 were stored in an empty concrete reservoir adjacent to the L-30 tank.<sup>49</sup> This sludge was owned by Afrimet and is now stored in building 410 - a former

*what is L-50 waste?*



water filtering facility. F-32 has 57 mg/ton of radium or a total of 12 grams in the 435,000 lbs of sludge.<sup>50</sup> This is an amount two times that of the radium concentration in L-30 and one tenth as much as K-65.<sup>51</sup> The K-65 has the highest radium concentration of all the materials on-site. This sludge is owned by Afrimet, and was refined at Mallinckroft Chemical Works, St. Louis, MO.<sup>52</sup>

Some K-65 drums were kept in the concrete igloos, where by the second day the radon levels in the igloos were nearly 100 times tolerance levels. They were coming so fast that no place could be found for them. Thousands of drums were left out in the open.<sup>53</sup> The 165 ft high silo water tower (building 434) was reinforced and filled with undrummed K-65 and in 1951 it had already begun to crack.<sup>54</sup> Some drums sat out so long they had deteriorated and had to be redrummed before dumping. The drums sat out for two years before being shipped to an AEC plant in Fernald, Ohio.<sup>55</sup>

"Approximately 60% of the radioactive material on the site is the property of Afrimet. The government contract with this corporation during the Manhattan district era stipulated that only the uranium content of the ore imported from the then Belgian Congo (Zaire) was to be the property of the U.S., with all other minerals remaining the property of Afrimet."<sup>56</sup> In 1949 Afrimet decided that they would no longer accept possession of the residue but wanted it to be stored for future use.<sup>57</sup> Their lease of the K-65 silo expired in 1983 and it is improbable that Afrimet will remove all if any of their materials. "From DOE negotiations with Afrimet, and in consideration of common defense and security arrangements between the U.S. and Belgium, Afrimet and DOE signed an agreement effective July 1, 1983, whereby Afrimet will pay DOE \$8 million and DOE will take title to the residues and release

Afrimet from it's obligations with respect to the residues."<sup>58</sup> To my knowledge We have never received this money. It is possible that another agreement has been made with the Belgians regarding this.

Plutonium and fission products (including cesium 137) were stored in a building that was both a fire hazard and so deteriorated that it offered no protection from the environment. These wastes came from Knolls Atomic Power Laboratory (KAPL) and were eventually shipped to Oak Ridge while some were burned by Hooker in the late 1950's.<sup>59</sup> Some radioactive material present on the site came from the University of Rochester in the early 1950's.<sup>60</sup> "A 1954 survey by the AEC disclosed the presence of cesium gaps in drums and loosely strewn on the ground in the Castle Garden dump area of LOOW" and in 1980 the cesium gaps remained, emitting 10 milliroentgens per hour.<sup>61</sup>

There was not only radioactive wastes present at the DOE site but also chemical wastes. 24,000 lbs of ferric sulfate was dumped on-site somewhere by Linde and zirconium refining residues were buried and caused sporadic explosions and fires.<sup>62</sup> Untreated thiocyanate wastes were discharged directly into LOOW outfall sewers from 1954-1955 by Carborundum Metals Co. This amounted to approximately 20-30 million gallons of waste dumped free of charge and with explicit sanction of the AEC.<sup>63</sup>

In December of 1970 an AEC radiological team surveying LOOW for radiation hazards, unexpectedly encountered a sign warning "Danger, Phosgene gas stored here"<sup>64</sup> Phosgene (carbonyl chloride) was used commercially and as a lethal chemical warfare gas. AEC called Army Chemical Warfare experts who later stated that the cylinders were empty and posed no hazard.<sup>65</sup> But why were they there in the first place and why wasn't the burial ground clearly mapped?

The Boron-Isotope Separation Plant supposedly had no hazardous materials associated with the project and no radioactive materials were used in the operation. Detailed records were not maintained on this operation by the DOE because it did not directly involve the Atomic Energy Program and could provide no information on the nature of any waste products generated.<sup>66</sup>

By 1952-1953 radioactivity had spread outside of the federal property. The central drainage ditch had three times the background level of radiation levels of uranium and radium.<sup>67</sup> In 1954 all of the contaminated dumps and burials were charted, measured and indicated on maps during the Hooker cleanup. Areas of buried waste or scrap were identified and radiation measurements were taken.<sup>68</sup> Most of the waste areas were now known but not cleaned up. In 1970 spot-check radiation surveys indicated radioactivity exceeded AEC guidelines on certain areas near the Boron-Isotope Plant. The contamination was attributed to "prior storage of uranium refinery residues and contaminated building rubble."<sup>69</sup> In 1972 15-20,000 cubic yards of radioactive soil and debris, "hot spots", both on and off-site were removed from the areas where AEC radiation standards were exceeded and piled on the remaining AEC site in a 15 ft. high, one acre mound.<sup>70</sup>

"The wastes stored on the open ground present an immediate short term problem. Storage area is only 100 feet from a master drainage ditch which drains into Four Mile Creek which drains into Lake Ontario. This land is poorly drained and surface ponding is common. Adequate draining of these areas must be maintained to prevent contamination of surface water runoff and subsurface water tables. Both surface and well water samples are routinely taken on and around the storage site and <sup>have</sup> been well within concentration guides."<sup>71</sup>

"In August of 1978 the DOE Environmental Measurements Laboratory began off-site radon monitoring both indoors and outdoors, to supplement the property-line monitoring done by National Lead. Radon exhalation levels were found to be excessive in only one area, at the fence line near the central drainage ditch. DOE plans to spray coat some of the residues at this area to temporarily reduce radon exhalation."<sup>72</sup> They actually moved the fenceline westward about 400 feet as a temporary measure. The fenceline readings are now below state standard. In 1982 DOE is to complete work on the site to improve the containment of materials that will reduce fenceline radon concentrations to approximately background levels.<sup>73</sup>

Our house, on Pletcher Road, had radon monitoring done both indoors (about one year) and outdoors (from 1980-mid 1985). The yearly readings ranged from an average of .19-.26 picocuries/liter. These readings are well under the guideline value for the general public of 3 picocuries/liter for continuous exposure annually.<sup>74</sup>

The 1981 plant status has cesium 137 contamination at 70mR/hr, the building that houses the L-30 is leaking residues into a canal under the F-32 tank, which was leaking fluid into the central drainage ditch.<sup>75</sup>

Some of the DOE alternatives for long-term management are: 1) maintain the site as a permanent storage facility with additional measures taken to reduce radon exhalation 2) partially remove the material and consolidate the remainder or 3) completely remove the materials and decontaminate the site.<sup>76</sup>

While the alternatives are being studied interim remedial actions are taking place. These have been done so far: the K-65 waste from the silo (building 434) were hydraulically mined and transferred in a slurry via a four inch steel pipeline to building 411. The silo was demolished with

a wrecking ball and any contaminated soil, pipes, wreckage will be buried in the containment area.<sup>78</sup> Building 413 and 414 were upgraded and sealed and R-10 residues were stabilized to control off-site migration and reduce radon emanations.<sup>79</sup> A Waste Containment Area was developed surrounding the R-10 pile and buildings 411, 413 and 414. A dike and cutoff wall surround the containment area.<sup>80</sup> General decontamination is taking place, contaminated areas on-site are being moved into the containment area. Approximately 100,000 cubic yards have already been moved since 1982. The Waste Containment Area will be covered with an interim cap which is designed to "minimize water infiltration and radon emanation".<sup>81</sup> "The lower layer of the cap consists of three feet of compacted clay keyed into the dike, sloped to enhance natural drainage away from storage area. The upper layer is 18 inches of soil and topsoil, and a turf cover designed to minimize erosion and frost heave damage to underlying clay layer."<sup>82</sup>

The estimated total cost including the interim cap is \$37 million. This cap will last about 25 years. If the final decision is made to store the material there permanently, the cost for the final cap will be \$4-5 million more.<sup>83</sup> "When finished, more than 150,000 cubic yards of contaminated materials will have been cleaned up and stored in the Waste Containment Area, making the Niagara Falls Storage Site the largest completed decontamination project of its type in the United States."<sup>84</sup>



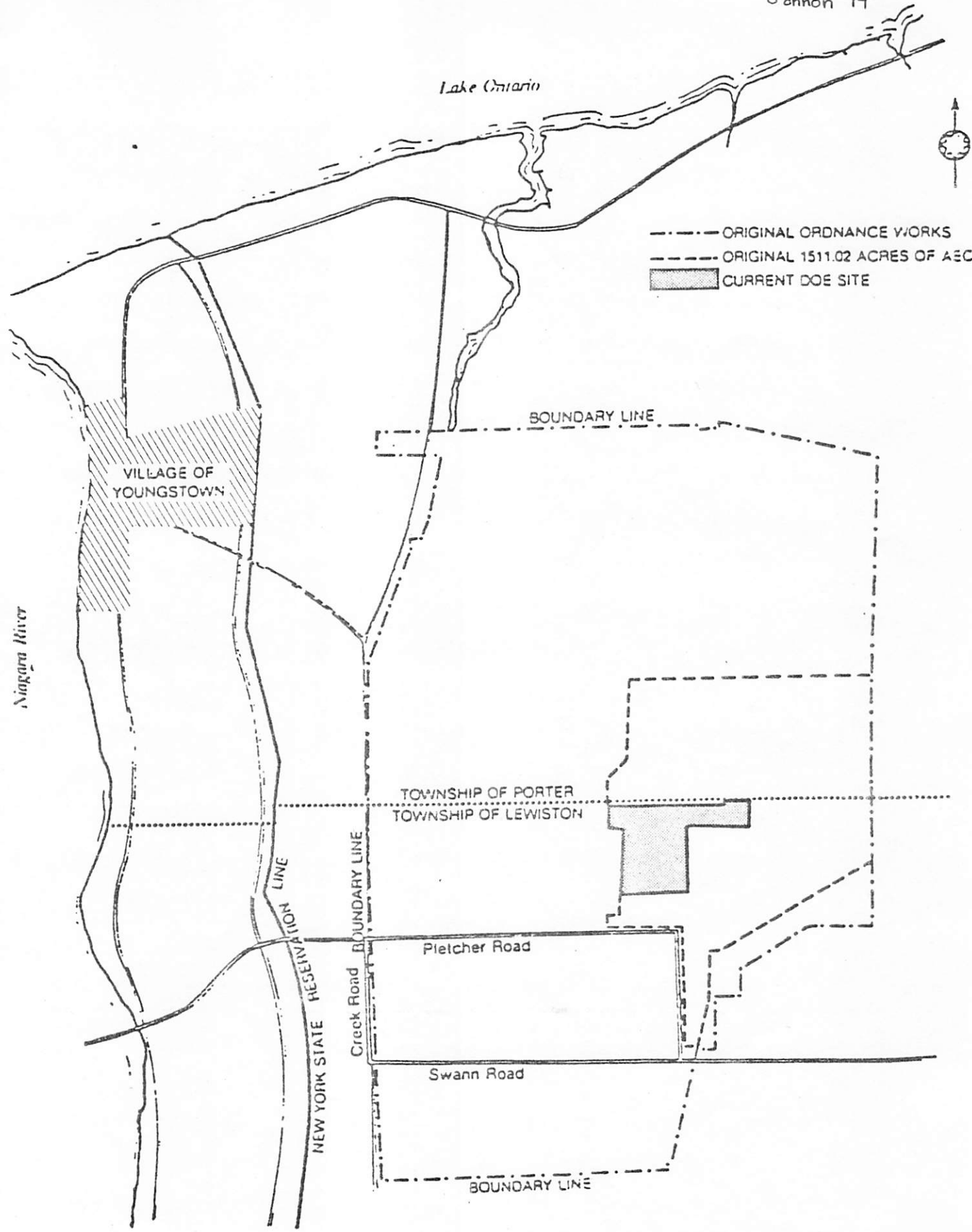


FIGURE 7 - Original Lake Ontario Ordnance Works and Present DOE Site  
 (Source: Department of Energy 1979)<sup>85</sup>

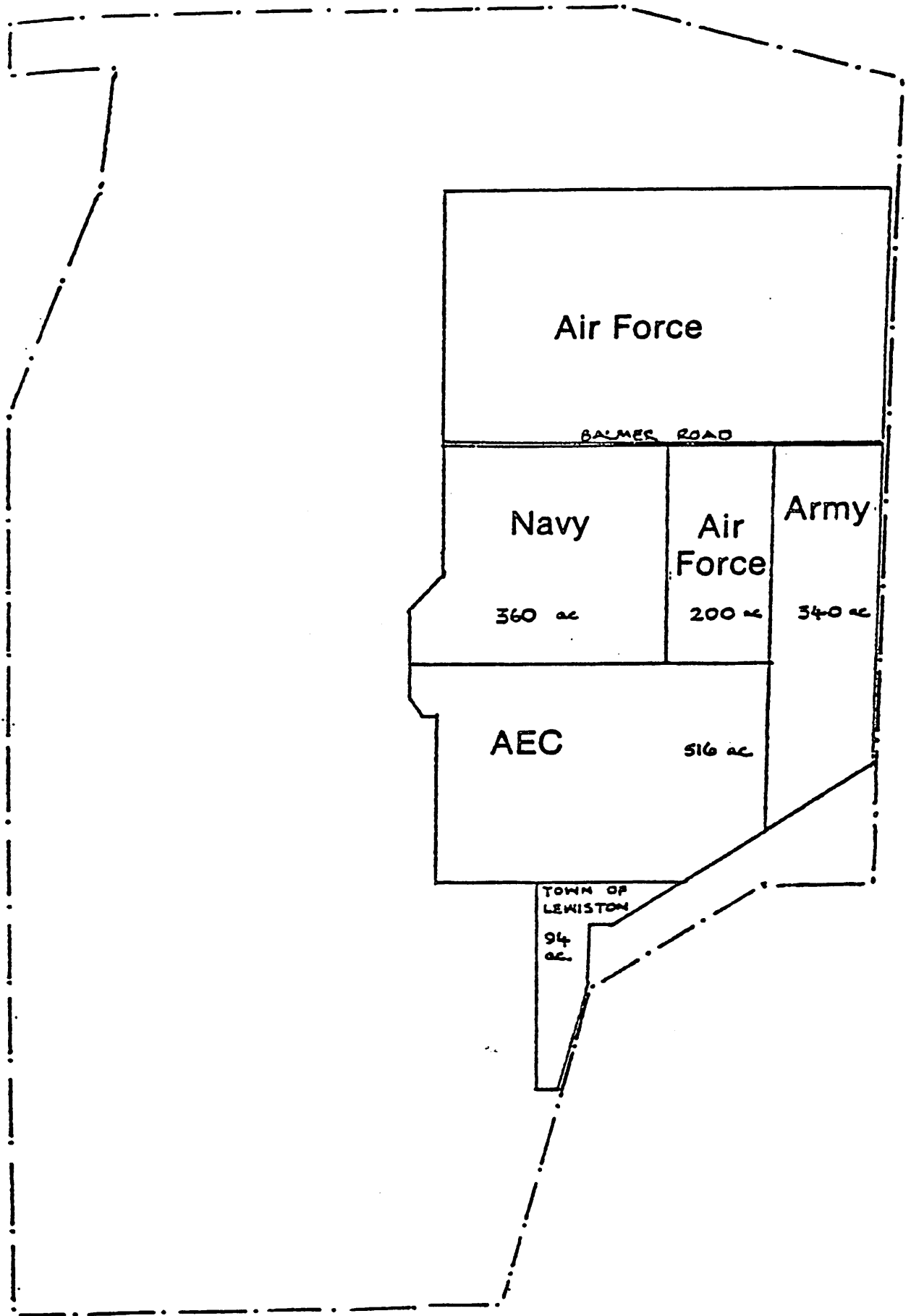


FIGURE 9 - L.O.O.W. 1955<sup>86</sup>  
(Source: Parry Report 1979)

Land uses immediately adjacent to the site are varied. A hazardous waste disposal facility operated by SCA Chemical Waste Services is located north and east of the site. A sanitary landfill operated by Modern Disposal, Inc., is adjacent to the east side of NFSS. South of the site is federal government property controlled by the General Services Administration, which is used for training construction equipment operators. There is also a sanitary landfill south of the site, which is owned by the town of Lewiston. West of the facility is a Niagara Mohawk Power Corporation transmission line corridor. Property west of the site is privately owned. All these properties are located on land that was once part of the original Manhattan Engineering District site (Figure 3.5).

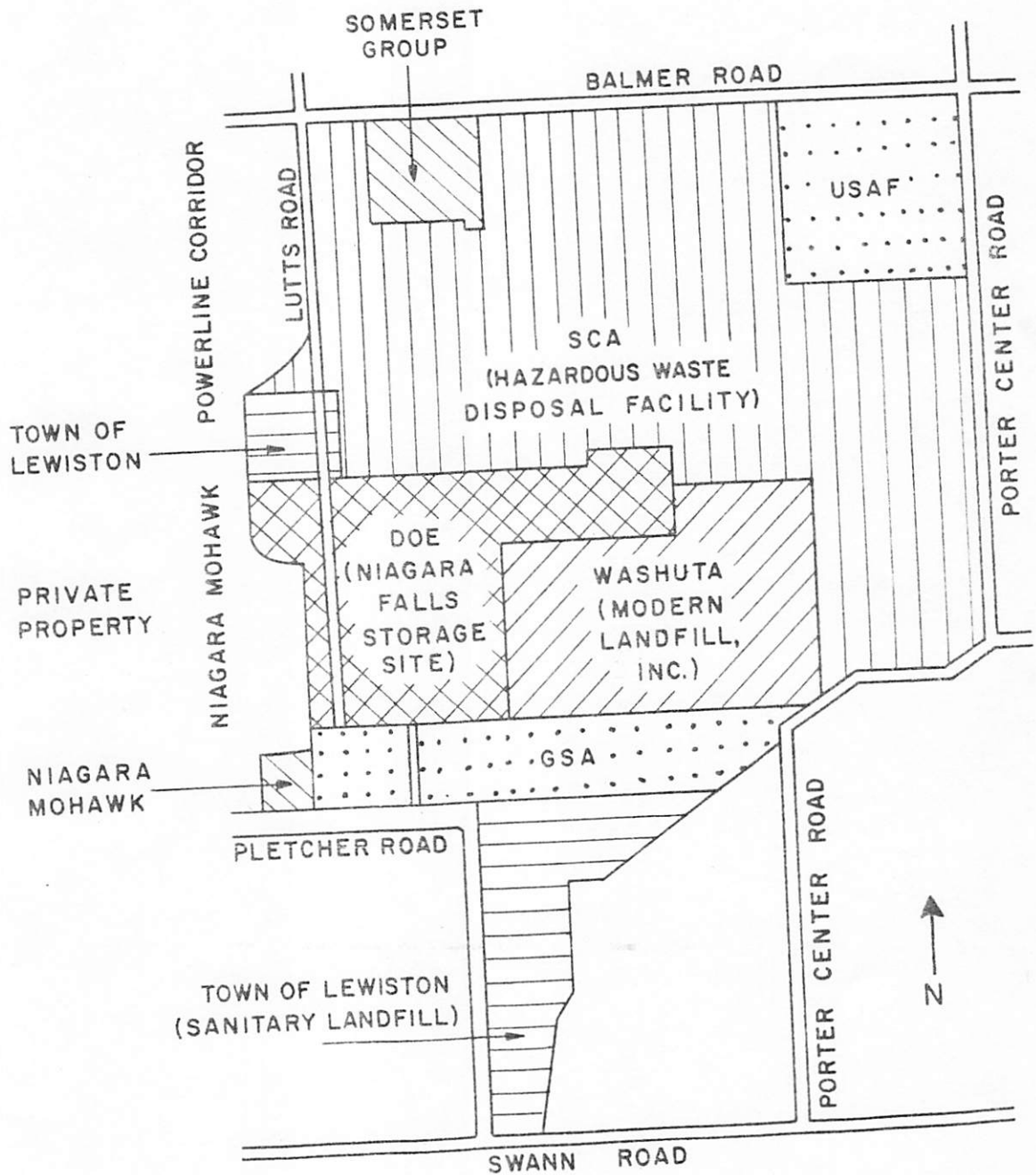


Figure 3.5. Current Ownership of the Original Manhattan Engineer District Site at the Lake Ontario Ordnance Works. 87

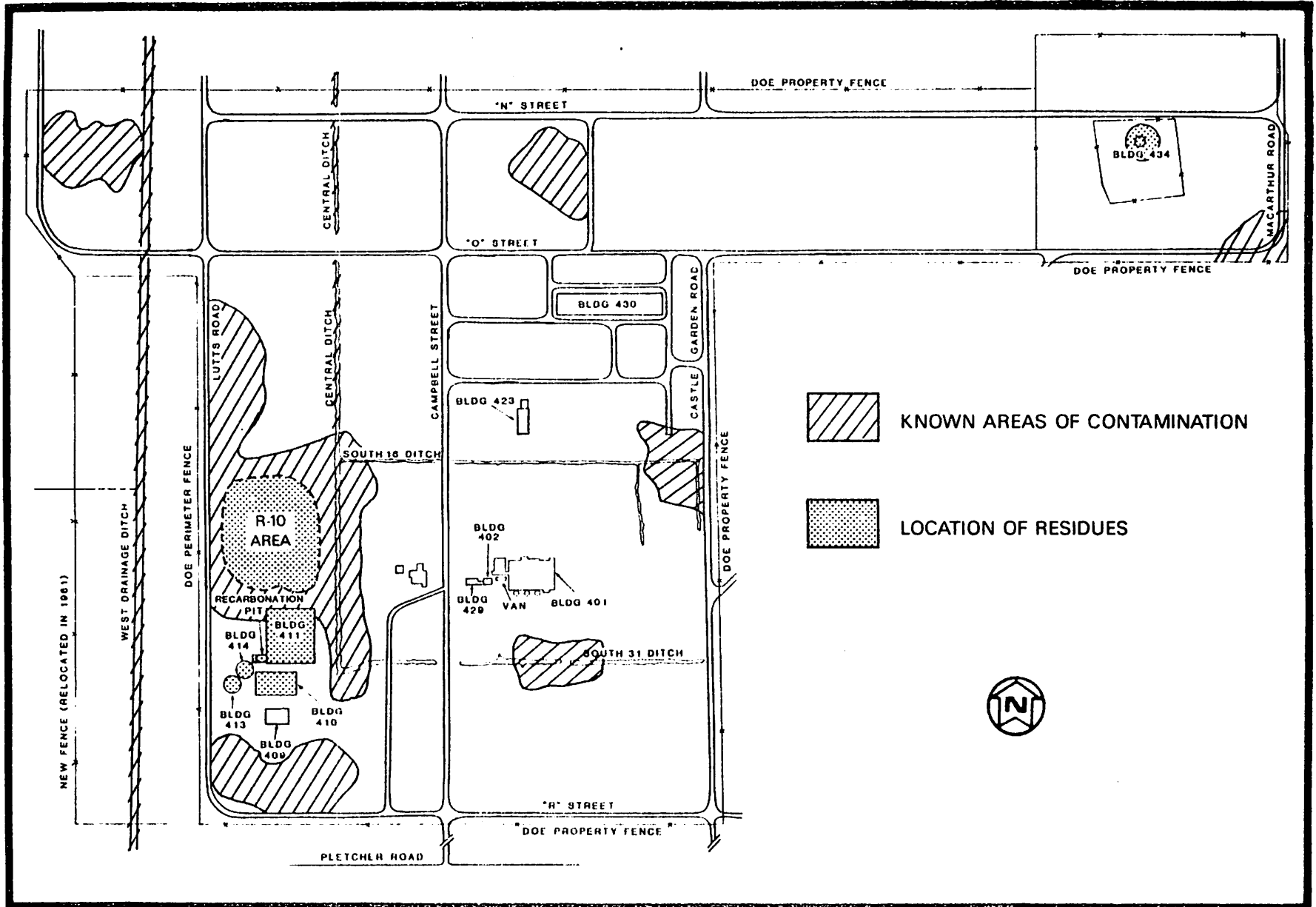


FIGURE 2 THE NFSS PRIOR TO INTERIM REMEDIAL ACTIONS 88

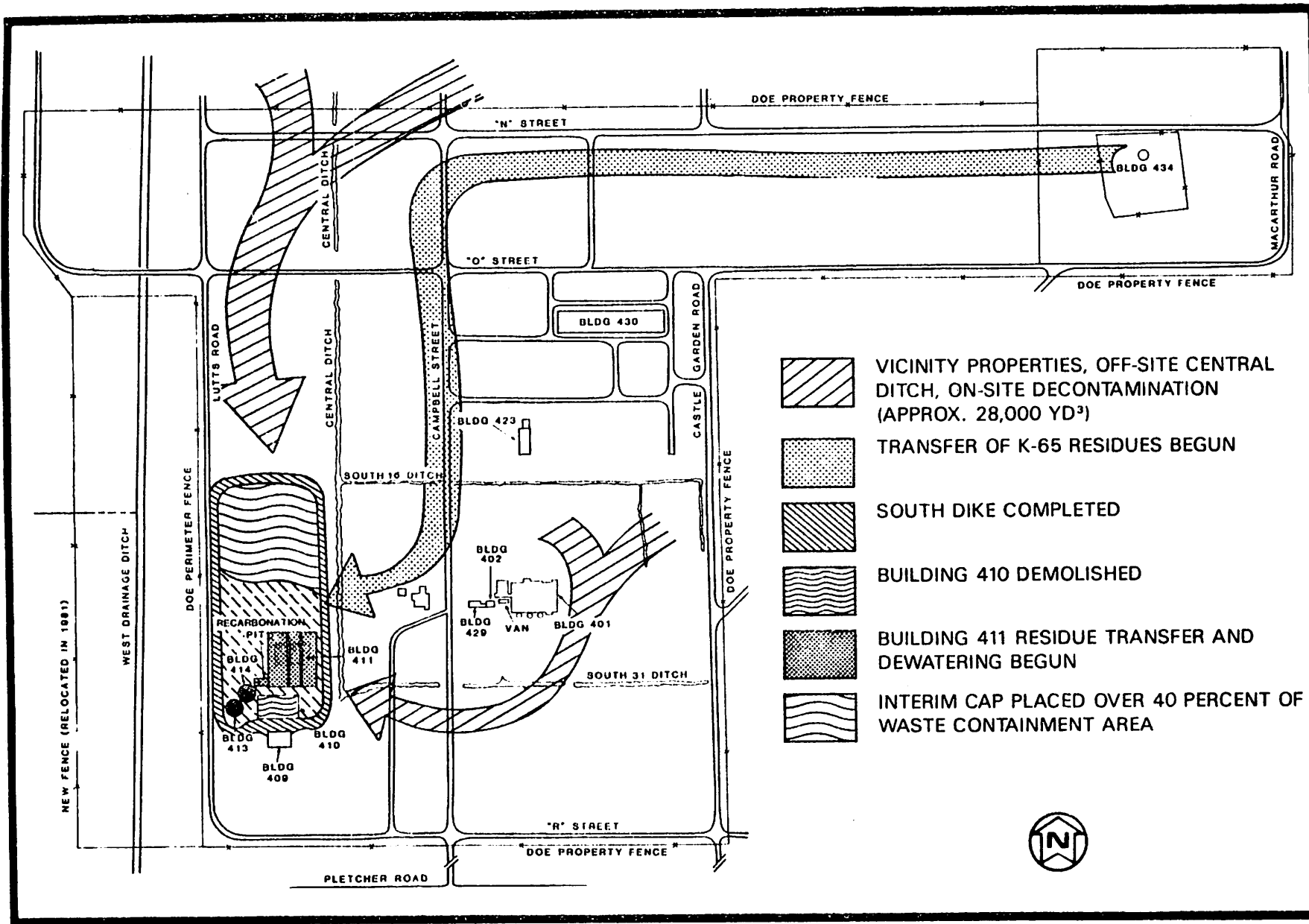


FIGURE 28 1984 NFSS REMEDIAL ACTIONS <sup>89</sup>



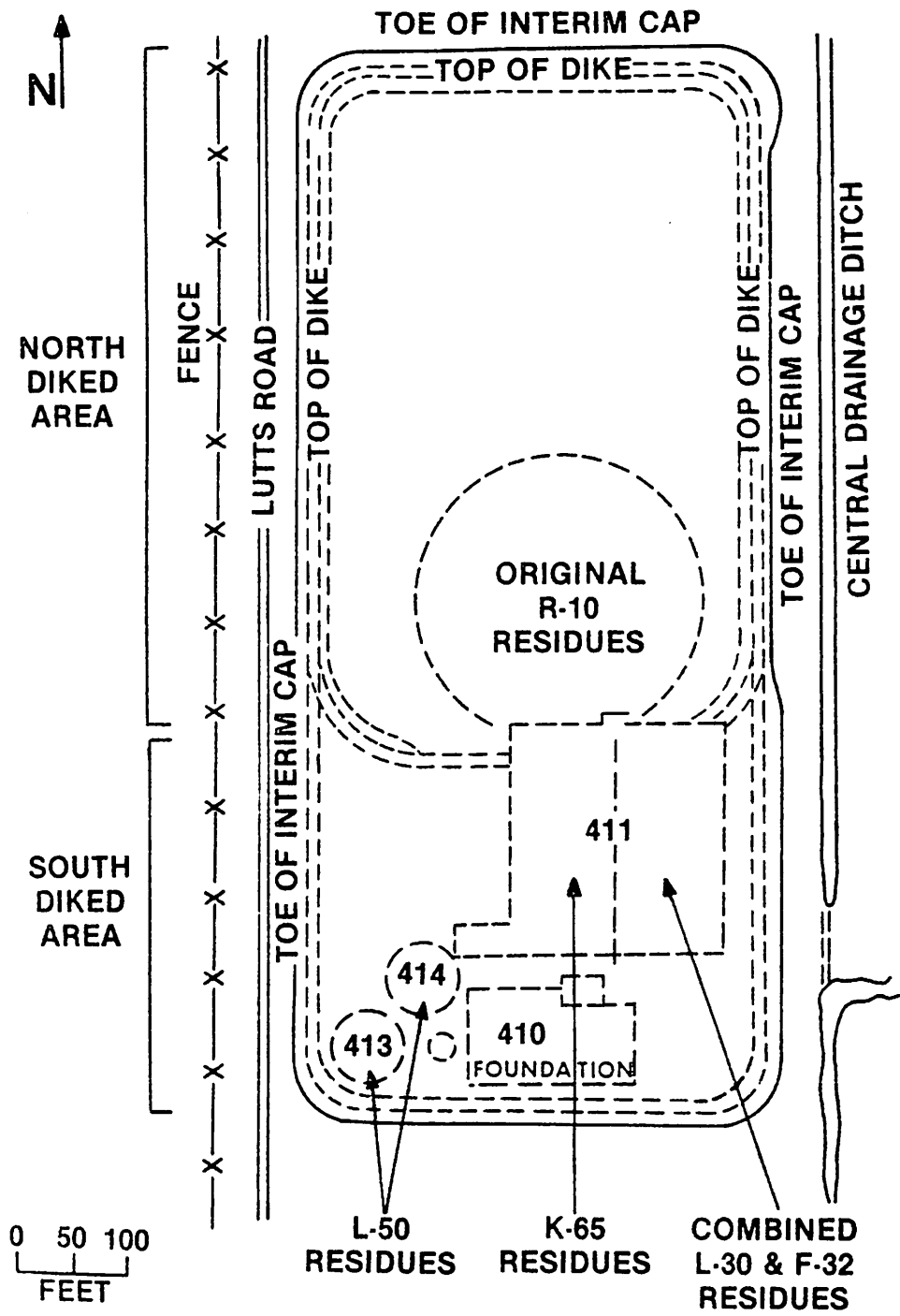


Figure 1.2. Plan View of the Waste-Containment Area in the Southwest Corner of NFSS Upon Completion of Interim Remedial Actions in 1985. Based on preliminary drawing provided by Bechtel National, Inc. 90

## End Notes

<sup>1</sup> The Assembly, State of New York, New York State Assembly Task Force on Toxic Substances, The Federal Connection: A History of U.S. Military Involvement in the Toxic Contamination of Love Canal and the Niagara Frontier Region (New York: January 29, 1981) 180.

<sup>2</sup> New York State, Interagency Task Force on Hazardous Wastes, Draft Report on Hazardous Waste Disposal in Erie and Niagara Counties, New York (New York: March 1979) III-137.

<sup>3</sup> N.Y.S. Assembly 180.

<sup>4</sup> N.Y.S. Assembly 180.

<sup>5</sup> N.Y.S. Assembly 183.

<sup>6</sup> N.Y.S. Interagency Task Force III-138.

<sup>7</sup> N.Y.S. Assembly 72.

<sup>8</sup> N.Y.S. Assembly 184.

<sup>9</sup> N.Y.S. Interagency Task Force III-137.

<sup>10</sup> N.Y.S. Assembly 74.

<sup>11</sup> N.Y.S. Assembly 184.

<sup>12</sup> N.Y.S. Assembly viii.

<sup>13</sup> N.Y.S. Assembly 202,207.

<sup>14</sup> N.Y.S. Assembly 185.

<sup>15</sup> N.Y.S. Assembly 186.

<sup>16</sup> N.Y.S. Interagency Task Force III-138.

<sup>17</sup> N.Y.S. Assembly 190.

<sup>18</sup> N.Y.S. Assembly 190-191.

<sup>19</sup> N.Y.S. Assembly 189.

<sup>20</sup> N.Y.S. Assembly 189.

<sup>21</sup> N.Y.S. Interagency Task Force III-137.

## End Notes cont'd

- 22 N.Y.S. Interagency Task Force III-137.
- 23 N.Y.S. Assembly 189.
- 24 N.Y.S. Assembly 189.
- 25 N.Y.S. Assembly 189.
- 26 N.Y.S. Assembly 189.
- 27 N.Y.S. Assembly vii.
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- 36 N.Y.S. Interagency Task Force III-138.
- 37 N.Y.S. Interagency Task Force III-139.
- 38 N.Y.S. Interagency Task Force III-139.
- 39 N.Y.S. Interagency Task Force III-140.
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- 42 N.Y.S. Assembly 184.
- 43 N.Y.S. Assembly 185.
- 44 N.Y.S. Assembly 220.
- 45 N.Y.S. Assembly 221.
- 46 N.Y.S. Assembly 221.
- 47 N.Y.S. Interagency Task Force III-146.

- VI H.A.S. ... III-100
- VII H.A.S. ... III-100
- VIII H.A.S. ... III-100
- IX H.A.S. ... III-100
- X H.A.S. ... III-100
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- XII H.A.S. ... III-100
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THE HOUSE OF REPRESENTATIVES

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- 48 N.Y.S. Interagency Task Force III-135.
- 49 N.Y.S. Assembly 225.
- 50 N.Y.S. Assembly 226.
- 51 N.Y.S. Assembly 226.
- 52 N.Y.S. Assembly 227.
- 53 N.Y.S. Assembly 228.
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- 56 N.Y.S. Interagency Task Force III-135.
- 57 N.Y.S. Assembly 222.
- 58 U.S. Department of Energy, Draft Environmental Impact Statement,

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August 1984) 1-1.

- 59 N.Y.S. Assembly 237.
- 60 N.Y.S. Interagency Task Force III-145,
- 61 N.Y.S. Assembly 97.
- 62 N.Y.S. Assembly 242.
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- 64 N.Y.S. Assembly 84.
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- 66 N.Y.S. Interagency Task Force III-145.
- 67 N.Y.S. Assembly 251.
- 68 N.Y.S. Assembly 225.
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74 Clifford R. Rudy, Letters to W.T. Gannon, 12/80-3/85 one letter every three months.

75 N.Y.S. Assembly 267.

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Rental, AF  
as a portion  
of his 12000  
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