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Department of Environmental Conservation

Division of Environmental Remediation

Record of Decision

Buffalo Outer Harbor/Radio Tower Area Site
City of Buffalo, Erie County
Site Number 9-15-026

March 1999

New York State Department of Environmental Conservation
GEORGE E. PATAKI, *Governor* JOHN P.CAHILL, *Commissioner*

DECLARATION STATEMENT - RECORD OF DECISION

Buffalo Outer Harbor/Radio Tower Area
Inactive Hazardous Waste Site
City of Buffalo, Erie County, New York
Site No. 9-15-026

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedial action for the Buffalo Outer Harbor / Radio Tower Area inactive hazardous waste disposal site which was chosen in accordance with the New York State Environmental Conservation Law (ECL). The remedial program selected is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300).

This decision is based upon the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for the Buffalo Outer Harbor / Radio Tower Area Inactive hazardous Waste Site and upon public input to the Proposed Remedial Action Plan (PRAP) presented by the NYSDEC. A bibliography of the documents included as a part of the Administrative Record is included in Appendix B of the ROD.

Assessment of the Site

Actual or threatened release of hazardous waste constituents from this site, if not addressed by implementing the response action selected in the ROD, presents a current or potential threat to public health and the environment.

Description of Selected Remedy

Based upon the results of the Remedial Investigation/Feasibility Study (RI/FS) for the Buffalo Outer Harbor site, and the criteria identified for evaluation of alternatives, the NYSDEC has selected excavation of contaminated soil exceeding cleanup levels followed by on-site treatment utilizing bioremediation. The components of the remedy are as follows:

1. A remedial design program to verify the conclusions of the conceptual design, and provide the details necessary for construction, operation, maintenance and monitoring of the remedial program.

2. Excavation of an estimated 8,000 yd^3 of soil of which approximately 3,500 yd^3 requires remediation.

3. Treatment of nitrobenzene contaminated soil on-site utilizing bioremediation techniques consistent with treatability studies conducted during the RI/FS.

4. Redeposition of soil on-site after sampling confirms that the site cleanup objective of 14 ppm nitrobenzene has been met.

5. Placement of 24 inches of clean soil over the treated soil redeposition areas, site regrading and restoration consistent with intended future use of the property.

6. Monitoring of site groundwater to verify the effectiveness of the site remedy.

7. Institutional controls are recommended to restrict shallow groundwater usage beneath the site, to ensure the continued integrity of the soil cover and to restrict inappropriate future use of the site.

New York State Department of Health Acceptance

The New York State Department of Health concurs with the remedy selected for this site as being protective of human health.

Declaration

The selected remedy is protective of human health and the environment, complies with State and Federal requirements that are legally applicable or relevant and appropriate to the remedial action to the extent practicable, and is cost effective. This remedy utilizes permanent solutions and alternative treatment or resource recovery technologies, to the maximum extent practicable, and satisfies the preference for remedies that reduce toxicity, mobility, or volume as a principal element.

March 31, 1999
Date

Michael J. O'Toole, Jr., Director
Division of Environmental
Remediation

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RECORD OF DECISION

Buffalo Outer Harbor Site / Radio Tower Area

City of Buffalo, Erie County, New York
Site No. 9-15-026
March 1999

SECTION 1: SUMMARY OF THE RECORD OF DECISION

The New York State Department of Environmental Conservation (NYSDEC) in consultation with the New York State Department of Health (NYSDOH) has selected the remedy to address the significant threat to human health and the environment created by the presence of hazardous waste at the Buffalo Outer Harbor/Radio Tower Area (RTA) Site. As more fully described in Section 3 and 4 of this document, past filling operations at the Buffalo Outer Harbor has resulted in the disposal of a hazardous waste sludge containing high levels of nitrobenzene, in the vicinity of the Niagara Frontier Transportation Authority (NFTA) communications radio tower. This disposal activity has resulted in the following significant threats to the public health and/or the environment:

1) a potential significant threat to human health could occur if future land use and inappropriate site development results in completed dermal and inhalation exposure to nitrobenzene and other contaminants found on site

2) a potential significant environmental threat to Lake Erie exists should migration of contaminated groundwater from the Radio Tower Area occur.

In order to restore the Buffalo Outer Harbor/Radio Tower Area inactive hazardous waste disposal site to predisposal conditions to the extent feasible and authorized by law, and to eliminate or mitigate the significant threats to the public health and the environment that the hazardous waste disposed at the site has caused, the following remedy was selected:

- Soil containing nitrobenzene contamination in excess of cleanup objectives will be excavated and treated on site utilizing a bioremediation technique known as aerobic/anoxic cycling. Soil from the site has undergone a treatability study that demonstrated the feasibility of a proprietary bioremediation technology to cost effectively meet cleanup objectives. However, in the event remedial venders are unavailable or otherwise unable to deliver timely and effective full scale bioremediation services, a proven alternative technology, low temperature thermal desorption, will be utilized to meet the remedial objectives.

- In either event, treated soils will be redeposited on-site and covered with 2 feet of clean backfill.

- A groundwater monitoring program will be put in place to verify the effectiveness of the soil remediation in eliminating the source of groundwater contamination and to ensure the continued protection of Lake Erie.

- Deed restrictions will be recommended to insure the integrity of the remedy and to restrict inappropriate future site use.

The selected remedy, discussed in detail in Section 8 of this document, is intended to attain the remediation goals selected for this site in Section 6 of this Record of Decision (ROD), in conformity with applicable standards, criteria and guidance (SCGs).

SECTION 2: SITE LOCATION AND DESCRIPTION

The Buffalo Outer Harbor/Radio Tower Area is located in the City of Buffalo in Erie County, New York (see Figure 1). The site is located approximately 1 mile south of downtown Buffalo, and is bordered to the west by the Buffalo Outer Harbor (Lake Erie). On the east, the property is bordered by Fuhrmann Boulevard and State Route 5. The Buffalo Ship Canal and the Buffalo River are located approximately 500 feet and 2,000 feet to the east of the site, respectively.

The site is located in the southeast corner of the parcel of land known as the Buffalo Outer Harbor property. All 110 acres of the property including the RTA are currently owned by the Niagara Frontier Transportation Authority (NFTA) which acquired the property from the U.S. Army Corps of Engineers in the 1950s. The Buffalo Outer Harbor property is characterized by relatively flat topography and is predominantly vacant. The Allen Boat Company is located near the center of the Outer Harbor property and operates a boat yard adjacent to the Bell Slip (see Figure 2). The Bell Slip provides access to the Allen Boat Company from the Buffalo Outer Harbor and Lake Erie.

The eastern and southern boundaries of the site are fenced. Access to the site is from Fuhrmann Boulevard. One access road enters the Outer Harbor property just north of the RTA, near the Allen Boat Company. A second access road is located to the north of the Outer Harbor property connecting The Pier restaurant with Fuhrmann Boulevard. The third access road enters the property from near the Allen Boat Company and passes through a continually operated guard booth used for controlling access to the NFTA warehouse center Terminals A and B. The NFTA communications radio tower is located adjacent to the site, hence the designation of Radio Tower Area.

SECTION 3: SITE HISTORY

Site history will be described as it relates to the filling activities of the entire Buffalo Outer Harbor property of which the RTA is but a small (6 acre) section.

In the early 1800s, the Lake Erie shoreline was east of Fuhrmann Boulevard and the present day Route 5. In about 1840, a sea wall was constructed along the shoreline approximately at the location of Route 5. From approximately 1865 to 1890, an outer harbor break wall was constructed approximately 2,000 feet offshore. During this period, the area near the foot of Michigan Avenue was occupied by numerous railroad facilities and storage yards.

The majority of the Buffalo Outer Harbor property was created as a result of land reclamation and filling activities that have occurred over the past 100 years. Landfilling activities began in 1874 when a sand catch was built south of the present Bell Slip. The Michigan Avenue Pier, located north of the property, was constructed in 1926. A pier, located on the southern portion of the property where the present day

Port Terminal A is located, was constructed in 1931. The material used to construct these piers is unknown.

The remaining portions of the property were filled between the Michigan Avenue pier and the pier at Terminal A over the 100-year period by various methods. The Preliminary Site Assessment Report prepared by Empire Soils Investigation, Inc. in 1991, reported the following filling activities:

1927-1935	Landfilling at the foot of Michigan Avenue
1935-1951	Filling along the shoreline
1951-1960	Filling along the southern shoreline
1960-1965	Dredge filling of northern portion of the property
1965-1968	Dredge filling of southern portion of the property
1968-1978	Filling of the ponded water on the southern portion of the property (vicinity of RTA)
1970-1986	Miscellaneous filling and bulk storage

The Ford Motor Company occupied the Terminal A building in the 1940s. The filled area located just north of the Terminal A building was allegedly used by Ford to dispose of cafeteria, office and general plant refuse. Unknown quantities of furnace casting sands from the Chevrolet plant located in Buffalo were also disposed of in this area.

A report prepared by Greeley and Hansen in September of 1944, entitled "Report on the Collection and Disposal of Refuse," Buffalo, New York, indicated "there are four dumps in active use for the disposal of ashes, noncombustible rubbish and the residue from the incineration plant." One of the areas described is the Fuhrmann Boulevard Landfill. "Dumping at this site extends along the harbor front from the city pier opposite the end of Michigan Avenue about 3,000 feet to the south, and is on property owned partly

by New York State and partly by the New York Central and the Buffalo Creek Railroads. As presently operated, and without the construction of a bulkhead to retain the fill, there remains a dumping capacity of approximately 250,000 cubic yards at this site."

In the 1950s, the U.S. Army Corps of Engineers contracted the Great Lake Dredge and Dock Company to dredge the Buffalo Outer Harbor Shipping Channel and dike the area north of Terminal A. The spoil was dredged from the area in the vicinity of the Union and Lakawana Canals and was placed in the southern portion of the property. Dredging spoil removed from the outer harbor channel was used to fill the northern portion of the property. An estimated 2,130,000 cubic yards of dredged material went into the property. The harbor dredging and filling operations were completed in 1964.

During the 1950s, the NFTA acquired the property from the U.S. Army Corps of Engineers. The southern portion of the property, including the area now defined as the Radio Tower Area, was still a low lying wetland area. Additional fill operations were conducted between 1965 and 1979 in this area and an estimated 930,000 cubic yards of construction fill was disposed by various contractors. No records exist with regard to these fill activities.

From approximately 1969 to approximately 1988, William Pfohl Trucking Corporation operated a transfer station at the property, where dry bulk materials were stored and delivered from the property. The materials included rock salt, zircon and sand, foundry sand (from Chevrolet Motors and River Road Foundry Plant), iron ore pellets, ball and china clay, gypsum rock, potash and scrap metal.

The property is currently vacant except for the Allen Boat Company located adjacent to the Bell Slip. Bulk materials are no longer stored at the Outer Harbor property.

SECTION 4: CURRENT STATUS

In response to a determination made by a Preliminary Site Assessment (PSA) prepared for the Niagara Frontier Transit Authority (NFTA) by Empire Soils Investigations (1991) that the presence of hazardous waste presents a potential threat to human health and the environment, the entire Buffalo Outer Harbor

property was listed as a Class 2 site. The NYSDEC completed a Remedial Investigation/Feasibility Study (RI/FS) to more fully identify conditions at the site.

4.1: Summary of the Remedial Investigation

The purpose of the RI was to define the nature and extent of contamination resulting from previous activities at the property, and to verify the presence of characteristic hazardous waste as previously determined by the Preliminary Site Assessment. Table 2 provides a summary of the sampling results by geographic sub area for the entire Buffalo Outer Harbor property. Chemical concentrations are reported in milligram per kilogram (mg/kg) for soil and microgram per liter (ug/l) for water samples

The RI for the Outer Harbor was conducted in two phases. The first phase was conducted between May and November 1994, and the second phase in June 1995. A report entitled Phase I/Phase II Remedial Investigation Report, Buffalo Outer Harbor property has been prepared describing the field activities and findings of the RI in detail.

The Phase I/Phase II RI field programs for the Buffalo Outer Harbor Site included the following:

- Surface Soil Sampling
- Monitoring Well and Piezometer Installation
- Test Pit Excavation
- Subsurface Soil Sampling
- Surface Water Sampling
- Surface Water Sediment Sampling
- Groundwater Sampling
- Ambient Air Sampling
- Air Monitoring and Radiation Survey
- Wildlife Habitat Survey
- Monitoring Well and Borehole Survey

To determine which media (soil, groundwater, etc.) contain contamination at levels of concern, the RI analytical data was compared to SCGs. Groundwater, drinking water and surface water SCGs identified

for the Buffalo Outer Harbor property were based on NYSDEC Ambient Water Quality Standards and Guidance Values and Part V of NYS Sanitary Code. NYSDEC TAGM 4046 soil cleanup guidelines for the protection of groundwater, background conditions, and USEPA remediation criteria were used as SCGs for soil. The NYSDEC Division of Fish and Wildlife Technical Guidance for Screening Contaminated Sediments was used for surface water sediments.

Based upon comparison of the results of the remedial investigation to the SCGs and potential public health and environmental exposure routes, the vast majority of the of the property, though sporadically contaminated with metals, PAHs and PCB's , was not found to contain consequential amounts of hazardous waste. Therefore, in October 1997 NYSDEC placed public notice that over 100 acres of the property, exclusive of the RTA, would be removed from the site definition in the Registry of Inactive Hazardous Waste Disposal Sites.

The Radio Tower Area was found to contain a significant and consequential amount of hazardous waste that requires further action. This portion of the Outer Harbor property remains on the registry.

4.2 Nature and Extent of Contamination:

Buffalo Outer Harbor Property Soils

The site was surveyed, and a 100' x 100' grid was established resulting in 112 surface soil sampling locations. The samples were collected and analyzed for Target Compound List (TCL) semi-volatile organic compounds (SVOCs), pesticides, PCBs and metals. Ten additional surface soil samples were collected during the Phase II investigation. In general, surface soils were sporadically contaminated with low levels of PCBs and PAHs and moderate levels of metals including lead, copper and zinc in excess of screening criteria.

A total of 122 subsurface soil samples were taken from a total of 62 soil borings installed during the Remedial Investigation. All the soil borings were continuously sampled with a spilt spoon and were visually logged by a geologist utilizing the Modified Burmeister Soil Classification System. Results verify the Outer Harbor is reclaimed land, consisting primarily of hydraulic fill, sand fill, and Construction and Demolition (C&D) debris and landfill debris. The area north of the Bell Slip in the vicinity of Fuhrmann

Boulevard described as containing landfill debris is likely part of the former Fuhrmann Boulevard Landfill which reportedly received incinerator ash. All samples were analyzed for SVOCs, pesticides, PCBs, and metal. Twenty grab samples, exhibiting field vapor readings greater than 10 ppm were also collected and analyzed for VOCs. The RI subsurface soil investigation identified an area in the vicinity of the NFTA Radio Tower that is significantly contaminated. This area was the subject of supplemental site investigation to identify the nature and extent of the contamination. Results of the sampling for surface and subsurface soils for the Buffalo Outer Harbor property are presented in Table 2.

Radio Tower Area Soils

Table 1 summarizes the contaminants of concern in the Radio Tower Area by media (surface soil, subsurface soil, groundwater) and compares the data with the Standards, Criteria and Guidelines for the site. The focus of the investigation is an area of stained subsurface soils and sludge like material in the subsurface that is contaminated by elevated levels of volatile and semi-volatile organic compounds. The subsurface soil was stained with a shoe polish like sludge. The soil from the stained area was analyzed and the results determined that the principle organic contaminant of concern is nitrobenzene detected as high as 13,000 mg/kg, with an average concentration in the contaminated area of 450 mg/kg. Antimony, a metal, also was present at elevated levels as high as 5,500 mg/kg in subsurface soil samples taken from the stained soil area. Additionally, other organic contaminants including chlorobenzene, naphthalene and 4-chloroaniline were detected at significantly elevated levels in the same samples and is likely associated with the nitrobenzene contamination and the disposal of the sludge. Toxicity Characteristic Leaching Procedure (TCLP) testing for leachable nitrobenzene confirmed that the contaminated soil in RTA is a characteristic hazardous waste (Table 4).

Calculations were performed during the FS to determine the total area and volume of contaminated soil. Field observations were combined with laboratory results to determine a thickness of contaminated soil in each boring. A total of 26 soil borings were evaluated. The thickness of contaminated soil was contoured using Surfer Contouring Software. Figure 3 delineates areas of subsurface soil contamination in the RTA.

In addition to the subsurface contamination, low levels of PCBs (8.2 ppm) , and metals (lead at 780 ppm) above screening criteria are present in the surface soils of the RTA. However, the levels detected are generally consistent with those found throughout the delisted Buffalo Outer Harbor property.

Groundwater

Results from groundwater samples collected from the RTA indicate the presence of elevated levels of volatile and semi-volatile organic contaminants. Groundwater contaminants that significantly exceed groundwater standards include 4-chloroaniline at 3600 ug/l, dichlorobenzene at 150 ug/l and naphthalene at 890 ug/l. Class GA groundwater standards for these compounds are 5 ug/l for 4-chloroanline and dichlorobenzene, and 10 ug/l for naphthalene. Antimony was also detected above the SCG of 3 ug/l in one shallow well screened to twenty (20) feet in the RTA. Although there are elevated levels of semivolatile organic compounds (SVOCs) and volatile organic compounds (VOCs) in the groundwater, the contamination is localized and groundwater flow is limited by the minimal hydraulic gradients present in this area of filled lake bottom and generally low permeability of fill material. Sample results from downgradient monitoring wells verify that the groundwater contamination is not readily migrating at this time. However, there is a concern that development of the RTA and/or vacant areas of the Buffalo Outer Harbor property adjacent to the RTA could provide pathways via underground utilities for migration of currently localized contaminants to Lake Erie and elsewhere.

Groundwater samples were also obtained from a number of wells located throughout the Buffalo Outer Harbor property. Groundwater sample results from areas outside the RTA contained low levels of metals and some wells exhibited low levels of SVOC compounds above the Class GA groundwater standards. The levels of sodium, manganese, magnesium and iron may be attributed to waste disposal at the former Fuhrmann Boulevard Landfill, bulk storage activities that occurred on-site and/or general groundwater quality in the vicinity of the site. Due to the limited migration of groundwater contamination and the low permeability of the fill material chemical loading to the Lake is minimal under current conditions. Sampling of the surface waters of Lake Erie confirm that there are no present impacts to water quality from the Buffalo Outer Harbor property.

In summary, groundwater samples collected from the Radio Tower Area indicate that groundwater has been impacted by disposal of organic contaminants. Chlorobenzene, napthalene, 4-chloroaniline, as well as inorganic contaminants, lead and antimony have been detected in groundwater above groundwater standards in the vicinity of the RTA. Sampling of groundwater monitoring wells in the RTA did not detect nitrobenzene, even though this contaminant is the most prevalent organic contaminant in the soil of the RTA. Apparently the nitrobenzene is bound to the soil matrix and is not readily causing contamination of the groundwater. Nearby downgradient wells currently do not indicate the presence of elevated levels

of any of these contaminants. However, an intermediate well installed to a depth of 40 feet and screened in the native overburden of the RTA, showed the presence of low levels of 4-chloroaniline, which indicates some downward migration of contamination.

Surface Water

The results of the samples collected from the surface water of Lake Erie (Outer Harbor), Bell Slip and Michigan Avenue Slip do not indicate that surface water in the vicinity of the Buffalo Outer Harbor property is being impacted by contaminants associated with the RTA. Only three metals (aluminum, selenium and silver) were detected above the surface water standards. These metals were not detected at elevated levels in the RTA and are not attributed to site contamination.

Sediment

Levels of lead and zinc above NYSDEC sediment criteria were detected in two of the three sediment samples collected from the Bell Slip. These levels may be attributed to runoff from the Outer Harbor property and/or activities at the Allen Boat Company. Consistently low levels of pesticides, PAHs and PCBs were detected in nearly all of the sediment samples collected in Lake Erie (Outer Harbor), the Michigan Avenue Slip and the Bell Slip, including the background sample collected at the entrance at the breakwater. The sediment samples from the Lake with few exceptions were below the NYSDEC Division of Fish and Wildlife lowest effect sediment screening criteria. The NYSDEC has concluded that the results are ubiquitous for the urban industrial setting and that surface runoff from the Outer Harbor property is not contibuting significant amounts of contamination to the Outer Harbor sediments.

4.3 Summary of Human Exposure Pathways

The Qualitative Risk Assessment for the Buffalo Outer Harbor property summarized the chemicals of concern in each medium for each of the sub areas of the Outer Harbor property. It assessed the completeness of the exposure pathways for the contaminants of concern in each of the sub areas based on the potential receptors and exposure routes.

The overall objective of any remedial action for the RTA is to meet applicable Standards, Criteria and Guidelines, and to mitigate the significant threats to human health and the environment. Accomplishment of this objective requires a reduction in contaminant concentrations and/or elimination of potential

exposure pathways. An exposure pathway is how an individual may come into contact with a contaminant. The five elements of an exposure pathway are:

1) the source of contamination;
2) media and transport mechanisms;
3) the point of exposure;
4) the route of exposure; and
5) the receptor population.

These elements of an exposure pathway may be based on past, present, or future events. The potential pathways for exposure of humans to contaminants from the Radio Tower Area include the following:

- Ingestion of contaminated soil containing dissolved or particulate-bound contaminants;
- Inhalation of vapors or airborne particulate-bound contaminants;
- Dermal absorption of contaminants via direct contact with waste, contaminated soil and groundwater;
- Direct contact with contaminated runoff and;
- Migration of contaminated groundwater to nearby surface waters.

Should the site remain unremediated, potential human receptors in the area of the RTA include on-site workers, individuals accessing the site for fishing, recreation or other purposes, and off-site individuals in the vicinity of the site. Under current use conditions, the RTA does not pose a significant threat to human health. However, increases in site use and inappropriate or uncontrolled site development would likely result in unacceptable levels of exposure to residents, recreational users and/or on site workers. Additionally, uncontrolled or inappropriate development of an unremediated RTA, or areas in the vicinity of the RTA, could create new migration pathways that permit currently static contaminated groundwater to enter nearby surface water. As an example, installation of sewer lines, water mains and other utilities, in the vicinity, could easily create a pathway for spreading the contamination. Although no current uses

of groundwater exist in the RTA, remediation of the contaminated soils should be considered to mitigate this source of groundwater contamination.

As future land use could increase human use of the adjacent Buffalo Outer Harbor property, access to an unremediated RTA would need to be restricted. Land use plans call for a possible expansion of the light industrial/commercial development that the site owner operates out of the Terminal A and B buildings that are immediately south of the RTA. Containment options to limit potential exposures would restrict the expansion of the current facilities into this area. Parties involved with the future Outer Harbor property development should be informed of the risks posed by the adjacent RTA.

A detailed evaluation to identify contaminants of concern at the site, and define migration pathways of these site contaminants and routes of exposure, is provided in the Qualitative Health Risk Assessment for the Buffalo Outer Harbor Site, dated December 1995.

4.4 Summary of Environmental Exposure Pathways

As part of the RI/FS, a Habitat based assessment was completed conforming to the NYSDEC Guidelines entitled "Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites" - dated June 1991. The assessment described the existing ecology at the Buffalo Outer Harbor property, including a property specific description of major habitat types and associated fish and wildlife populations, as well as, identification of any significant on-site ecological resources. Overall, since the entire property was created as a result of land reclamation and filling activities, the entire property can be considered disturbed lands. However, for the current conditions, the habitats presently existing at the property have been ascertained and are described in detail in the RI report.

The Qualitative Risk Assessment, evaluated the exposure pathways and potential fish and wildlife receptors, for each sub area of the Outer Harbor property and provided a qualitative risk assessment to serve as a basis for evaluating remedial alternatives. The principle pathways for environmental exposure to contaminants for wildlife are direct contact with, and/or ingestion of, contaminated surface soils throughout the Buffalo Outer Harbor property. Potential exposure to lead, zinc and PAHs in sediment in the Bell Slip may also present a risk to aquatic organisms.

SECTION 5: ENFORCEMENT STATUS

The NYSDEC and the Niagara Frontier Transit Authority (NFTA), as site owner, entered into a consent order on January 24, 1994. The order obligated the NFTA to reimburse to the State for its cost to conduct a Remedial Investigation/Feasibility Study. This order was amended on April 24, 1997. The amendment modified the repayment schedule for the RI/FS.

NYSDEC will approach the NFTA as site owner and other Potential Responsible Parties that can be identified to implement the selected remedy. If an agreement cannot be reached with the PRPs, the NYSDEC will evaluate the site for further action under the State Superfund. The PRPs are subject to legal actions by New York State for recovery of all response costs the State has incurred.

The following is the chronological enforcement history of this site.

Orders on Consent

Date	Index
1/24/94	#B9-02333-88-07

Development and Implementation of a Remedial Investigation/Feasibility Study; Niagara Frontier Transportation Authority Respondent, as modified on April 24, 1997.

SECTION 6: SUMMARY OF THE REMEDIATION GOALS AND SELECTED ACTION

The selected remedy for any site should, at a minimum, eliminate or mitigate all significant threats to the public health or the environment presented by the hazardous waste at the site. Based upon the results of the RI, only the Radio Tower Area was determined to contain consequential amounts of characteristic hazardous waste . In 1997, in response to the RI the NYSDEC redefined the site boundary to include only the Radio Tower Area. This PRAP proposes a remedy intended to mitigate the significant threat to human health and the environment posed by the hazardous waste source identified in the Radio Tower Area.

The Radio Tower Area is significantly contaminated with improperly disposed organic waste (nitrobenzene). This waste poses a potential significant threat to human health and the environment. The NYSDEC will select a remedial program whose goals have been established through the remedy selection process stated in 6NYCRR Part 375-1.10. The overall goal is to meet all Standards, Criteria and Guidelines and be protective of human health and the environment. Attainment of "prerelease conditions" is not feasible, since the site is land that was reclaimed from Lake Erie, through decades of filling as described in Section 3.

At a minimum, the remedy selected will eliminate or mitigate all significant threats to the public health and to the environment presented by the hazardous waste disposal at the Radio Tower Area through the proper application of scientific and engineering principles. The goals selected for the Radio Tower Area are as follows:

1. Prevent or reduce, to the extent possible, the potential for direct contact exposure (dermal absorption, inhalation and incidental ingestion) with contaminated surface soils and subsurface soils in the Radio Tower Area.

2. Reduce, to the extent practicable, adverse impacts to groundwater from contaminated soils.

3. Prevent or reduce, to the extent practicable, the migration of contaminants through groundwater to surface water.

4. Allow for the productive reuse of the property, remove impediments to access the Lake Erie waterfront, and provide for delisting or reclassifying the site from the Registry of Inactive Hazardous Waste Disposal Sites.

Sec 6.1 - Radio Tower Area SCGs

Standards, Criteria and Guidelines (SCGs) were considered when formulating, screening and evaluating remedial alternatives. SCGs may be categorized as contaminant-specific or action-specific. Federal statutes, regulations and programs may apply to the site where New York State standards do not exist.

Contaminant specific SCG's for soil contamination and cleanup were based upon review of applicable guidance documents, such as NYSDEC Technical and Administrative Guidance Memorandum #4046 (TAGM 4046): Determination of Soil Cleanup Objectives and Cleanup Levels (January 1994).

Upon completion of the Remedial Investigation, the Radio Tower Area was identified as an area of concern due to the presence of high concentrations of nitrobenzene. There are several possible SCGs that could apply to remediation of nitrobenzene contaminated soil. The TAGM 4046 level for nitrobenzene of 0.2 mg/kg is set for protection of groundwater, however there are significant factors that work against being reasonably able to meet this goal. Attainment of Class GA groundwater standards, in the near term through remediation of nitrobenzene contaminated soil alone, is not feasible due to the nature of the fill material and the degraded groundwater quality surrounding the RTA.

Additionally, the Department's evaluations show that achieving the TAGM 4046 cleanup goal, for this compound at this site, would be cost prohibitive. Application of the TAGM would result in an approximate additional 7-10 thousand cubic yards soil requiring remediation. The lower cleanup goal would also remove from consideration bioremediation as an effective lower cost remedial technology. Total project cost for the thermal destruction of all soil in excess of the TAGM cleanup goal could be in excess of $10,000,000. However, the presence of residual soil contaminants, including the metal antimony, would still prevent unrestricted use of the property. Further stabilization of the residuals and a long term pump and treat program to potentially allow unrestricted use of the site would add several additional millions of dollars to the project. Therefore, an evaluation of possible alternative soil cleanup goals was developed for soil contaminated with nitrobenzene during the FS.

There are several other established soil screening criteria applicable to nitrobenzene in soils. The USEPA has developed human health risk based concentrations / soil screening levels for contaminants for residential use. The level developed by the USEPA in October 1997 for nitrobenzene contaminated soils that would support residential use is 39 mg/kg. The USEPA RCRA Land Ban requires that nitrobenzene contaminated media be reduced to no more than 14 mg/kg to allow disposal in a solid waste landfill. In addition, the NYSDEC TAGM #3028, provides that soil contaminated with nitrobenzene does not have to be managed as a hazardous waste in New York State if the nitrobenzene levels are at or below 40 mg/kg. Based upon a review of the remedial objectives and possible remedial technologies and alternatives,

NYSDEC has selected the USEPA LDR standard of 14 mg/kg as the remediation criteria, or cleanup goal, for the nitrobenzene contaminated soil at the RTA.

The selected cleanup goal of 14 mg/kg for nitrobenzene will be protective of human health so long as site groundwater is not used as a potable water source, and will allow for an evaluation of a greater range of remedial technologies. Use of the LDR standard as a cleanup goal will also provide flexibility for possible off site disposal options as a solid waste of treated soil and/or residual untreated soil from the RTA. Upon successful completion of cleanup to 14 mg/kg, the site should likely qualify for delisting from the Registry of Inactive Hazardous Waste Disposal Sites. However, residual contamination would remain and as such the site would not qualify for unrestricted use. The NYSDEC will recommend that the NFTA implement deed restrictions to restrict inappropriate future use of the site. Based upon a series of soil borings in the RTA, analytical results and visual observations of the subsurface soil in the RTA, approximately 3,500 yards of contaminated soil at an average concentration of 450 mg/kg exceeds the 14 mg/kg cleanup goal, and will require on-site remediation or off-site treatment and disposal.

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

The selected remedy should be protective of human health and the environment, be cost effective, comply with other statutory laws and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. Implementation of the site remedy should provide for appropriate future site reuse, the ability to facilitate lake access, and possible delisting of the site from the NYS Registry of Inactive Hazardous Waste Disposal Sites. As discussed in the previous section the remedial alternatives were not developed to provide for the unrestricted future use of the property. Cleanup to a level allowing unrestricted use of the site is not reasonably achievable and would be cost prohibitive. Instead the alternatives were developed for their ability to cost effectively accommodate carefully implemented reuse provided that institutional controls are maintained.

Careful consideration was given to the condition of the sites' groundwater and whether a long term pump and treat remediation program should be included as a component of the remedial alternatives. Four factors weighed against an active groundwater remedial component for this site. First, groundwater

contamination in the RTA is extremely localized. Nearby downgradient wells show no sign of impact from the RTA. Secondly, the principle contaminant of concern, nitrobenzene, has not been detected in the groundwater. Third, the site is not impacting the surface waters of Lake Erie. Lastly, the site and the entire Buffalo Outer Harbor property is serviced by municipal water from the City of Buffalo and the City ordinance that prohibits installation of potable water wells without a permit. Therefore, groundwater remediation, other than short term extraction and treatment for dewatering during remedial construction in the RTA, has been deemed not necessary to meet the remedial objectives.

Potential remedial alternatives for the Buffalo Outer Harbor/ Radio Tower Area Site were identified, screened and evaluated in a Feasibility Study for their ability to met the remedial goals and objectives. This evaluation is presented in the report entitled Feasibility Study Report, Buffalo Outer Harbor Site; City of Buffalo - Site No. 9-15-026, July 1998. A summary of the detailed analysis follows.

7.1: Description of Alternatives

The potential remedies are intended to address only the nitrobenzene contaminated soil and waste material at the RTA site.

Alternative #1 - No Action

Present Worth:	*$ 143,000*
Capital Cost:	*$ 0*
Annual O&M:	*$ 9,000*

The no action alternative is evaluated as a procedural requirement and as a basis for comparison. It requires continued monitoring only, allowing the site to remain in an unremediated state. This alternative would leave the site in its present condition and would not provide any additional protection to human health or the environment.

(*The Present Worth is calculated by adding the capital cost to the present worth of the Operation and Maintenance costs computed for the expected duration of the operation of the remedy or 30 years which ever is less, using a discount rate of 5% annually*)

Alternative #2 - Deed and Access Restrictions

Present Worth:	*$ 170,000*
Capital Cost:	*$ 27,000*
Annual O&M:	*$ 9,000*

Deed and access restrictions, such as eliminating access to the Radio Tower Area by fencing and posting of signs, are potentially applicable to this site. These restrictions would be implemented by the site owner (NFTA). The City of Buffalo would be provided with information on site conditions and recommended restrictions to ensure they are considered during the local planning and building permit process. Groundwater would be monitored periodically to evaluate changes over time and to ensure that the contaminants in the subsurface soils and groundwater are not migrating and posing a threat to Lake Erie (Outer Harbor).

Alternative # 3 - Containment/Isolation of Site Contaminants

Present Worth:	*$ 3,429,000*
Capital Cost:	*$ 2,407,000*
Annual O&M:	*$ 80,800*
Time To Implement	*6 months*

For this alternative, the contaminated soil in the Radio Tower Area would remain in place and be contained and isolated by placement of a low permeability cap and slurry wall. The cap would be sloped to provide proper drainage which may require the importing of grading material. The slurry wall would be constructed around the perimeter of the contaminated soil to a depth of 40 feet and keyed into the lower permeability native material underlying the area.

Groundwater extraction wells would be placed within the area of the slurry wall to reduce the groundwater head inside of the slurry wall to less than that outside of the wall. This would ensure that any migration of groundwater would be into the area of the slurry wall. Extracted groundwater may require pretreatment prior to being discharged to the Buffalo Sewer Authority. The entire RTA would be fenced in order to

prevent access to the area. A program for maintenance would be required to prevent and repair any damage to the cap and the pumping wells. A long term (30+ years) monitoring program would be required to insure effectiveness of the remedy.

Deed and access restrictions, eliminating access to the capped Radio Tower Area by fencing and posting of signs would be implemented by the site owner (NFTA). The City of Buffalo would be provided with information on site conditions and recommended restrictions to ensure they are considered during the local planning and building permit process. Groundwater would be monitored periodically to evaluate changes over time and to ensure that the containment system is operating properly and that contaminants in the subsurface soils and groundwater are not migrating and posing a threat to Lake Erie (Outer Harbor).

Alternative #4 - Soil Excavation and Off-site Treatment and Disposal

Present Worth:	*$ 7,440,000*
Capital Cost:	*$ 7,297,000*
Annual O&M;	*$ 9,000*
Time To Implement:	*3 Months*

Under this alternative, approximately 8,000 cubic yards of soil would be excavated from the RTA. Three thousand five hundred (3,500) yards of the soil from depths varying between 8 and 22 feet containing nitrobenzene in excess of 14 mg/kg would be transported off site for thermal treatment and disposal. After excavation and removal of the contaminated soil from the site, the excavated area would be backfilled to grade with the stockpiled top eight feet and clean imported fill. A clean soil cover would be placed over the site to eliminate contact with any residual soil contamination. A groundwater monitoring program would be developed to verify the effectiveness of the remedy and to insure continued protection of Lake Erie from residual groundwater contamination associated with the RTA.

Alternative # 5 - Excavation and Treatment of Contaminated Soil by Bioremediation

Present Worth:	*$ 3,415,000*
Capital Cost:	*$ 3,272,000*

Annual O&M: *$ 9,000*

Time to Implement: *12 Months*

For this alternative, approximately 8,000 cubic yards of soil would be excavated from the Radio Tower Area. Soil exhibiting elevated levels greater than 14 mg/kg of nitrobenzene, approximately 3,500 cubic yards, would be treated on-site utilizing a bioremediation process.

A bioremediation treatability study was completed during the FS. The study conducted by Grace Bioremediation Technologies evaluated the potential for the bioremediation of soil containing nitrobenzene at the RTA. The study focused on an evaluation of the efficacy of the DARAMEND bioremediation technology. The DARAMEND bioremediation technology enhances and promotes natural bioremediation rates by adjusting conditions in a soil or waste matrix to stimulate bioremediation of target compounds by indigenous microorganisms. The central element of this approach is the addition of DARAMEND amendments, a family of solid phase organic materials, which are added on a contaminant specific bases. The key to this technology's effectiveness on the RTA soil was application of repeated and sequential anoxic (without oxygen) and oxic (with oxygen) conditions to reduce and degrade the nitrobenzene. Anoxic conditions were achieved through addition of DARAMEND amendments, multivalent metals and water to the soil being treated. Oxic conditions were achieved through drying and tilling. Following 56 days of laboratory treatment the concentration of nitrobenzene had been reduced from 433 mg/kg to 3 mg/kg. Based on the results of the treatability study and review of successful field application of the technology, the DARAMEND bioremediation process offers an efficient and cost effective approach for treatment of the nitrobenzene impacted soils at the RTA.

Soil excavated from the upper 8 feet of the RTA was found during the RI to be absent of nitrobenzene levels above the 14 mg/kg SCG. This soil would be pre-excavated, tested, and if verified to be below the site cleanup goal, stocked piled for possible replacement in the excavation or disposed of off-site in a landfill. The excavation below 12 feet will require dewatering. Water removed from the excavation would either be treated on-site and discharged to the lake, or discharged with pretreatment, if required, to the municipal sewer system. A 2 feet clean soil cover would be placed over the RTA to eliminate any contact with residual contamination. Due to the elevated levels and toxic nature of the site contamination, it is likely that the excavation, handling and treatment of the soil would be conducted within a vapor control structure such as a temporary fabric building. Final details of a full scale bioremediation process

and the excavation will be completed during the remedial design. A groundwater monitoring program would be developed to verify the effectiveness of the remedy and to insure continued protection of Lake Erie from residual groundwater contamination associated with the RTA. Deed restrictions and institutional controls, would be recommended to insure that the continued integrity of the soil cover, restrictions on groundwater use from the RTA and the coordinated proper reuse of the property, would be implemented by the site owner (NFTA). The City of Buffalo would be provided with information on site conditions and recommended restrictions to ensure they are considered during the local planning and building permit process. Groundwater would be monitored periodically to evaluate changes over time and to ensure that the residual contaminants are not migrating and posing a threat to Lake Erie (Outer Harbor).

Alternative #5A - Excavation and Treatment of Contaminated Soil by Thermal Desorption

Present Worth:	*$ 3,972,000*
Capital Cost:	*$ 3,829,000*
Annual O&M	*$ 143,000*
Time To Implement;	*6 Months*

Under this Alternative all elements of the remedial program are the same as Alternative #5, except that the excavated contaminated soil would be treated on-site by thermal desorption to remove the nitrobenzene contamination. In the thermal desorption process, the organic compounds are thermally and physically separated from the soil particles by volatilization or evaporation. The condensed liquids containing the contaminants are transported off-site for disposal. Treated soil would be redeposited on site.

7.2 Evaluation of Remedial Alternatives

The criteria used to compare the potential remedial alternatives are defined in the regulation that directs the remediation of inactive hazardous waste sites in New York State (6NYCRR Part 375). For each of the criteria, a brief description is provided followed by an evaluation of the alternatives against that criterion. A detailed discussion of the evaluation criteria and comparative analysis is contained in the Feasibility Study.

The first two evaluation criteria are termed threshold criteria and must be satisfied in order for an alternative to be considered for selection.

1. Compliance with New York State Standards, Criteria, and Guidelines (SCGs). Compliance with SCGs addresses whether or not a remedy will meet applicable environmental laws, regulations, standards and guidance. Applicable federal and New York State SCG's are identified for this site to provide both action-specific guidelines for remedial work at the site and contaminant-specific cleanup standards for the alternatives under evaluation. In addition to the action-specific and contaminant-specific guidelines, there are location-specific guidelines that pertain to such issues as restrictions on actions at historic sites. The SCGs are described in detail in the site Feasibility Study.

The most significant SCG for remediation of the RTA is the selection of a cleanup criteria for soil contaminated with nitrobenzene. The State has selected the federal Land Ban Criteria of 14 mg/kg for nitrobenzene as being the cleanup goal that will cost effectively provide long term protection of human health and the environment. Cleanup to this level will allow for the productive reuse of the site in accordance with established local land use plans and the possible delisting of the site as per the remedial goals. In addition, treatment of soil contaminated with nitrobenzene to a level of 14 mg/kg or less will allow for possible off-site disposal of soil as a non hazardous solid waste, meet the USEPA's recommended health risk based standards, and meet New York States' contained in rule for contaminated media. Attainment of the NYSDEC TAGM #4046 goal of 0.2 mg/kg for protection of groundwater at this site is both technically impracticable and cost prohibitive. The selected site specific soil cleanup goal of 14 mg/kg allows for use of cost effective remedial technologies, such as bioremediation, that will be protective of human health and the environment.

Alternatives 1, 2 will not meet this criteria. The site would remain in an unremediated state and the soil contaminated with nitrobenzene will be left in place.

Alternative 3 would contain the site contamination in place, effectively eliminating direct exposure. However the concentration of contaminants would continue to exceed SCGs.

Alternatives 4, 5 and 5A will meet the SCG selected for soil. However all alternatives will be unable to achieve groundwater SCGs due to the nature of the historic fill and background conditions at the Outer Harbor property.

2. Protection of Human Health and the Environment. This criterion is an overall evaluation of the health and environmental impacts to assess whether each alternative is protective.

Alternative 1 does not meet this criteria. By leaving the site in its present condition there is the possibility that human or environmental receptors may come in contact with contamination.

Alternative 2 meets this criteria to a lesser degree. The institutional controls would reduce the potential exposure routes however, they may not be fully effective in providing overall protection to human health.

Alternatives 3 would meet this criteria. This alternative would effectively remove all possible routes of exposure thus providing significant protection to human health and the environment. However, as long as the source area remains, the potential exists that changing site conditions from inappropriate development, could lead to unacceptable exposures to both humans and the environment.

Alternatives 4, 5 and 5A will meet this criteria. These alternatives would reduce the concentration of contaminants of concern to levels that do not pose a significant threat to human health or the environment.

The next five "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

3. Short-term Effectiveness. The potential short-term adverse impacts of the remedial action upon the community, workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

Alternatives 1 and 2 present the lowest short term impact of all the alternatives. Since minimal site work would be conducted, these alternatives would not result in any additional risk to the community nor the

environment. Workers performing Operation and Maintenance (O&M) would be required to wear personal protection equipment to minimize potential hazards during sampling and maintenance activities.

Alternative 3 requires heavy construction equipment resulting in temporary increases in dust, noise and truck traffic while the cap is being placed. Most of the contaminated soil would remain in place, reducing the potential for short term exposures. Site workers would be required to wear appropriate personal protection equipment.

Alternatives 4, 5 and 5A will require extensive excavation of the contaminated area. Contaminated soil would either be transported off site or handled on site for treatment resulting in significant increase in the possibility of short term exposure. The excavation would be completed inside a temporary building, such as a fabric structure, that would prevent off site releases. Workers inside the building would be required to wear appropriate personal protection equipment. Alternatives 4, 5 and 5A would result in increased truck traffic, however Alternative 4 would significantly increase truck traffic leaving the site. All alternatives would be protective of the community and the environment. A health and safety plan would be implemented to insure the protection of site workers and the surrounding community.

4. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks; 2) the adequacy of the controls intended to limit the risk; and 3) the reliability of these controls.

Alternative 1 does not meet this criteria as no action would be taken.

Alternative 2 does not meet this criteria, while institutional controls can reduce potential exposure, they are not considered permanent, and the certainty of long term protection is much less than for Alternatives 4, 5 and 5A.

Alternative 3 meets this criteria somewhat. On site containment would require a long-term maintenance plan to assure the long term effectiveness of this alternative.

Alternatives 4, 5 and 5A will meet this criteria. Excavation and either off-site treatment and disposal or on-site treatment would permanently reduce soil contamination to SCG levels.

5. Reduction of Toxicity, Mobility or Volume. Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

Alternatives 1 and 2 do not meet this criteria. Neither alternative would result in any reduction in the toxicity, mobility nor volume of site contaminants.

Alternative 3 minimally would reduce the toxicity and volume through withdrawal of contaminated groundwater. However the bulk of the contamination would remain. Mobility would be reduced by installation of a slurry wall.

Alternatives 4, 5 and 5A will meet this criteria by excavating contaminated soil and treating contamination either on or off-site. Significant reductions in the volume and toxcity of the nitrobenzene contamination would occur through destruction of contaminants.

6. Implementability. The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction and the ability to monitor the effectiveness of the remedy. For administrative feasibility, the availability of the necessary personnel and material is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, etc.

Alternatives 1 and 2 are implementable with minimum effort, though the application of Institutional Controls would require administrative effort to adhere deed restrictions.

Alternative 3 meets this criteria. The technology and equipment necessary to implement this alternative are readily available. Slurry wall construction and capping are common remedial constuction techniques. The effectiveness of the remedy could be easily monitored by a series of groundwater wells. Discharge of contaminated groundwater to the Buffalo Sewer Authority or on-site treatment would need to be monitored for State discharge limit compliance.

Alternatives 4, 5 and 5A include excavation of soils to an approximate depth of 22 feet, which is well within the limits of standard practice and construction equipment. However, most of the excavation would take place below the water table and will require steel sheeting of the excavation area. The excavation would need to be dewatered and temporary pretreatment facilties may be necessary. The excavation of nitrobenzene contaminated soil may pose risk associated with the release of airborne contamination. The excavation and treatment will likely be housed in a readily available temporary enclosure to prevent releases to the surrounding community. There is sufficient capacity off-site to accept excavated soil for treatment and disposal. The technology to bioremediate soils on-site is available, however, the technology and bioremediation additives tested and proven effective are currently proprietary. Thermal desorption units are readily available technology. The discharge associated with the thermal unit would be have to meet the substantive requirements of a NYSDEC Division of Air permit. The overall effectiveness of the remedy could be easily monitored by implementation of a general site monitoring program. Coordination would be required with the existing site owner to allow operation and maintenance of the bioremediation treatment system and long term site monitoring.

7. Cost. Capital and operation and maintenance costs are estimated for each alternative and compared on a present worth basis. Although cost is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the remaining criteria, cost effectiveness can be used as the basis for the final decision. The present worth costs for each alternative are as shown.

PRESENT WORTH COST

Alternative 1 - $ 143,000
Alternative 2 - $ 170,000
Alternative 3 - $ 3,429,000
Alternative 4 - $ 7,440,000
Alternative 5 - $ 3,415,000
Alternative 5A- $ 3,972,000

The final criterion is considered a modifying criterion and is taken into account after evaluating those above. It is focused upon the public comments received on the Proposed Remedial Action Plan.

8. Community Acceptance - Concerns of the community regarding the RI/FS reports and the Proposed Remedial Action Plan have been evaluated. NYSDEC conducted a public meeting concerning the preferred remedy and a "Responsiveness Summary" included as Appendix A presents the public comments received and the Department's response to the concerns raised. In general, with one notable exception,

the public comments received were supportive of the selected remedy. Most comments concerned details on implementation that will be subject to a remedial design. One letter objecting to the proposed remedy was submitted on behalf of the AlliedSignal Corporation. The letter and NYSDEC's response is also included in Appendix A.

SECTION 8: SUMMARY OF THE SELECTED REMEDY

Based upon the results of the RI/FS, and the evaluation presented in Section 7, the NYSDEC is selecting Alternative 5, excavation and on-site bio-treatment of nitrobenzene contaminated soil as the remedy for this site.

This selection is based upon the following: *Alternatives 1 and 2* will not meet either of the threshold criteria. These alternatives will not be fully protective of human health and the environment nor will they attain compliance with the SCGs criteria. These alternatives also cannot meet the long term effectiveness and permanence criteria nor the reduction in toxcity, mobility or volume criteria.

Alternative 3 fails to meet all criteria as completely as Alternatives 4, 5, or 5A. This alternative provides a barrier between the waste at the site and potential human and wildlife receptors. This alternative is protective as long as proper operations and maintenance are continued at the site. The concentration of contaminants in both the soil and groundwater would continue to exceed SCGs, however the direct contact exposure pathways would be eliminated. Capping and slurry walls are well established techniques and are readily implementable. This alternative reduces the mobility of contaminants at the site but does not address either the toxicity nor volume of contaminants. Containment of the waste in place will restict future uses of the property and may prevent future site development identified by local planning. Alternative 3 will not allow the site to be delisted from the registry and its presence on the registry may act as a deterent to the development of the Buffalo Outer Harbor property.

Alternatives 4, 5 and 5A are equally effective and protective in the long term, but may have significant short term impacts associated with the excavation and handling of nitrobenzene contaminated soil. The use of an enclosure to house the excavation and a health and safety plan would mitigate the short term impacts. All are implementable, however, Alternative 5 may be somewhat more difficult to implement due to the

limited availabilty and proprietory nature of the specified bioremediation technology. Alternative 5A would require compliance with air discharge requirements for the thermal desorption unit. Alternative 5 is significantly lower in cost than Alternative 4 and somewhat lower in cost than Alternative 5A. Alternatives 4, 5, and 5A will likely result in the site's eventual delisting and meet the objective of allowing future site reuse. Since Alternative 5 provides the most cost efective permanent remedy and equally satisfies the other criteria, including the threshold criteria, it is the selected alternative.

The selection of Alternative 5 is contingent on the availability of remedial venders who are able to deliver timely and effective bioremediation services. During the remedial design, sources for the specified bioremediation services that are capable of meeting soil cleanup goals will be identified and evaluated. In the event that full scale bioremediation services prove to be unavailable or non cost efficient, then on-site low temperature thermal desorption technology (Alternative 5A) may be substituted for treating impacted site soils.

The estimated present worth cost to implement the remedy is $3,415,000 The cost to construct the remedy is estimated to be $3,272,000 and the estimated average annual operation and maintenance cost per year is $9,000 over an estimated period of five years.

The elements of the selected remedy are as follows:

1. A remedial design program to verify the components of the conceptual design and provide the details necessary for the construction, operation and maintenance, and monitoring of the remedial program. Any uncertainties identified during the RI/FS would be resolved.

2. Excavation of an estimated 8,000 yards of soil, of which approximately 3,500 yards requires remediation. The soil to be excavated that does not require treatment will be backfilled on-site.

3. Treatment of soil on-site utilizing bioremediation techniques consistent with the site treatability study conducted during the FS.

4. Either redeposition of treated soil on-site, or off-site landfilling of treated soil as a non hazardous solid waste after confimatory sampling.

5. Placement of 2 (two) feet of clean fill cover, site regrading and/or restoration consistent with intended future use of the property.

6. Monitoring of groundwater to verify the effectiveness of the selected remedy.

7. Deed restrictions will be recommended to ensure the continued integrity of the soil cover and to restrict inappropriate future use of the site.

As previously discussed, this selected alternative would result in some impacted surface and subsurface soil remaining at the site. After remediation, RTA surface soils will still contain low levels of metals and PCBs similar to what is present across the rest of the Outer Harbor property. The subsurface soils will contain antimony, and residual nitrobenzene at levels below the 14 mg/kg SCG. Though the levels of contamination remaining would not pose a significant risk to human health and the environment , the preferred remedy recognizes the potential for future use of the property and proposes to take the additional steps ot protectiveness by placing clean fill over the RTA. This clean fill cover would act as a barrier to residual contamination. The cover would also serve to provide proper grading and drainage of the remediated site. For the remedy to remain effective any future site use should ensure the continuous integrity of the clean soil cover. The NYSDEC will recommend to the site owner that deed restrictions are put in place to restrict future use and prevent intrusive work in the soil redeposition area. In addition, a groundwater monitoring program would be established to verify the effectiveness of the selected remedy.

8.1 Documentation of Significant Changes

There are no significant changes from the Proposed Remedial Action Plan

SECTION 9: HIGHLIGHTS OF COMMUNITY PARTICIPATION

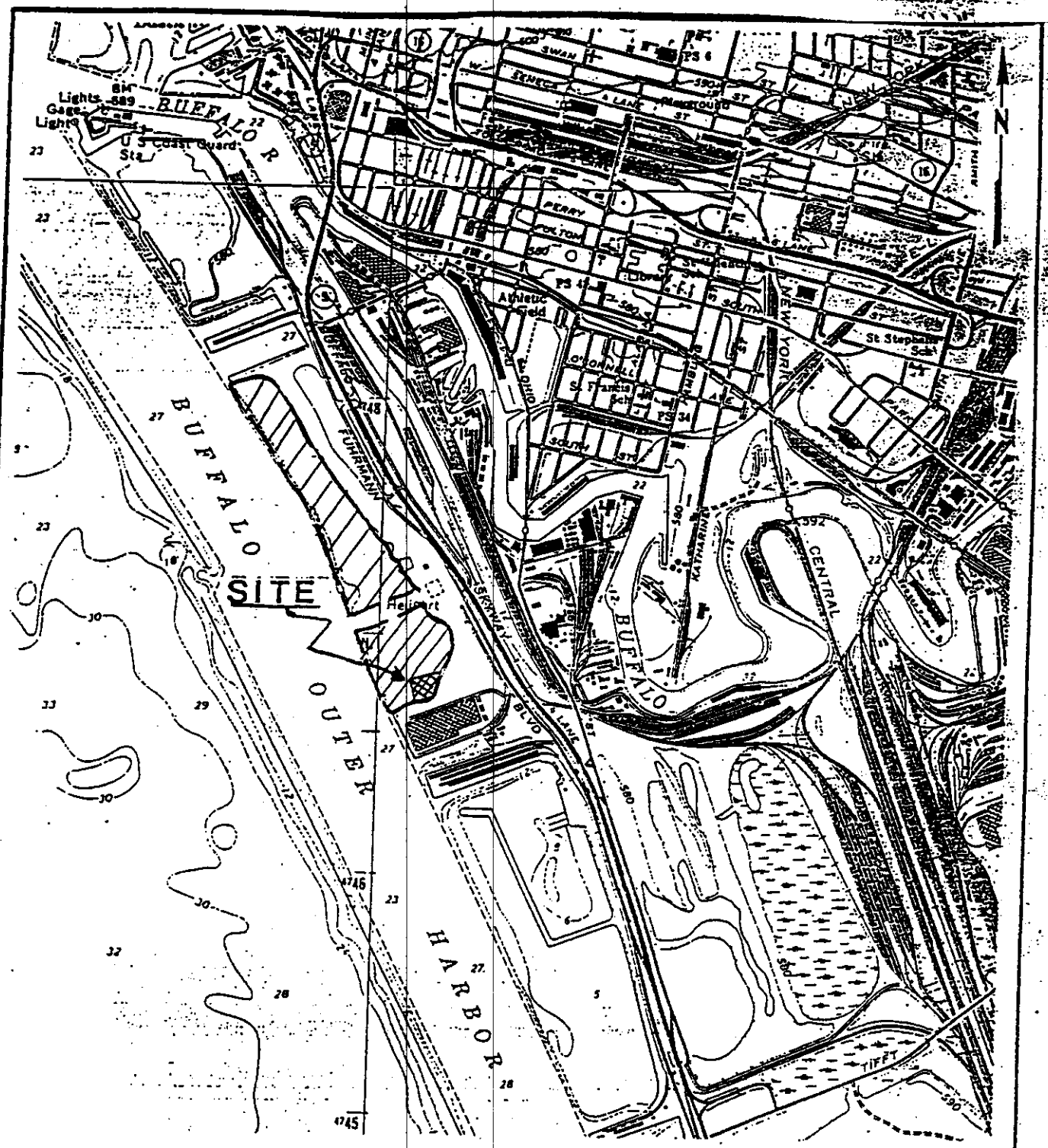
Document repositories were established at the following locations for public review of project related material:

* NYSDEC Region 9 Office
270 Michigan Ave.
Buffalo, New York 14203

* NYSDEC Central Office
50 Wolf Road
Albany, New York 12233

The following citizen participation activities were conducted:

* A site mailing list was established which included nearby property owners, local political officials, local media and other interested parties.
* Public Meeting - May 3, 1995; Presented the results of the Phase 1 Remedial Investigation.
* Fact Sheet - February 1996; Announced the results of the completed Phase 1/ Phase 2 Remedial Investigation and invitation to March 26, 1996 public meeting.
* Public Meeting - March 26, 1996; Presented the results of the completed Phase 1/2 Remedial Investigation.
* Fact Sheet - February 1999; Announced the Proposed Remedial Action Plan.
* Public Meeting Notice - February 8, 1999; Invitation to attend a public meeting on PRAP.
* Public Meeting - February 17, 1999; Results of the RI presented, possible remedial actions discussed, and presentation of the PRAP.



LATITUDE: 42°52'04"
LONGITUDE: 78°52'38"

SCALE
0 1000 2000 3000 4000 FEET

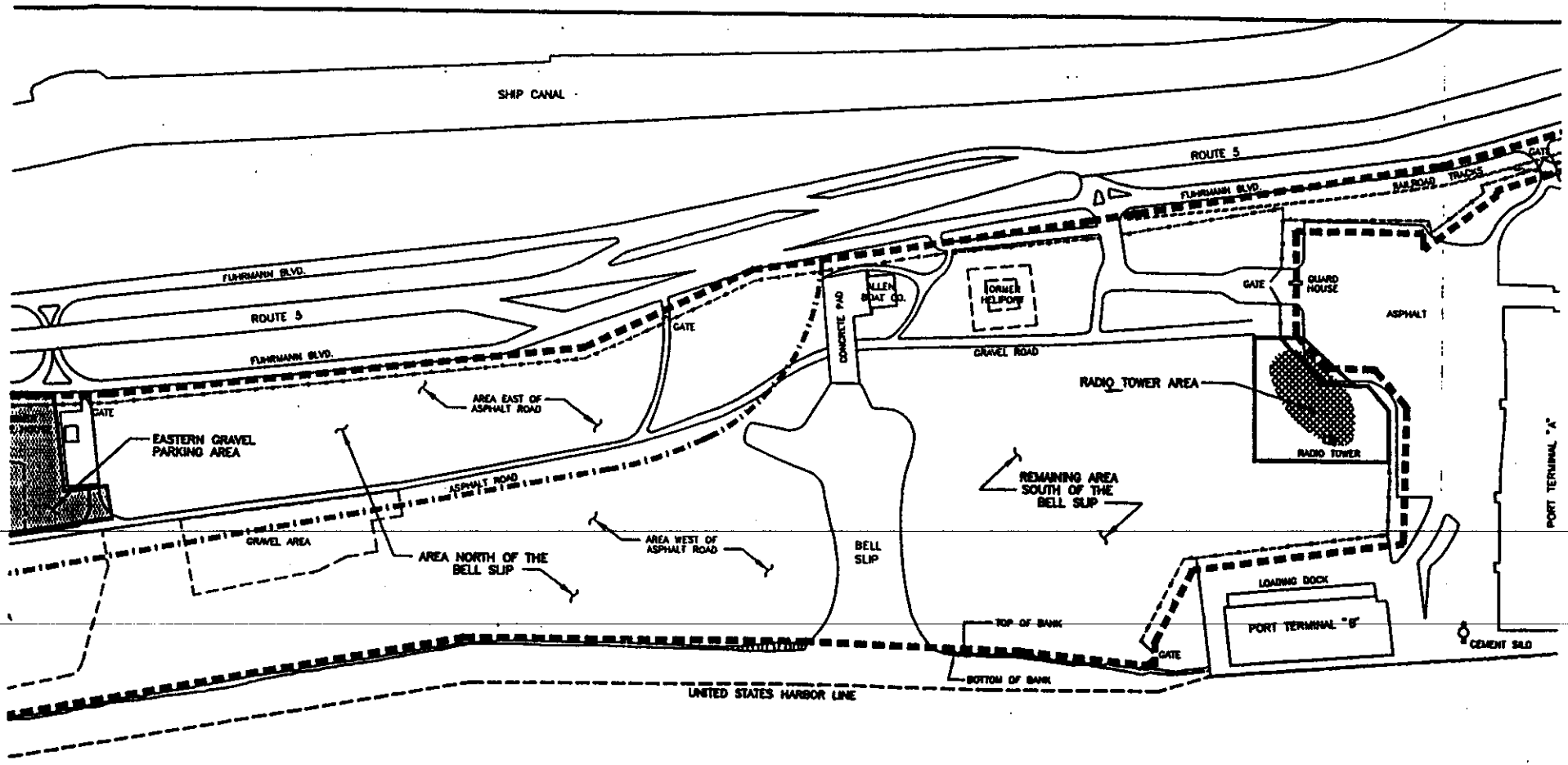
REFERENCE: U.S.G.S. 7.5' Topographic Map
Buffalo SE, NY (1965), Buffalo NE, NY (1965)
and Buffalo NW, NY-ONT. (1965) Quadrangles

Buffalo Outer Harbor/Radio Tower Area
Site No. 9-15-026

NEW YORK STATE DEPARTMENT
OF ENVIRONMENTAL CONSERVATION

SITE LOCATION MAP

FIGURE 1

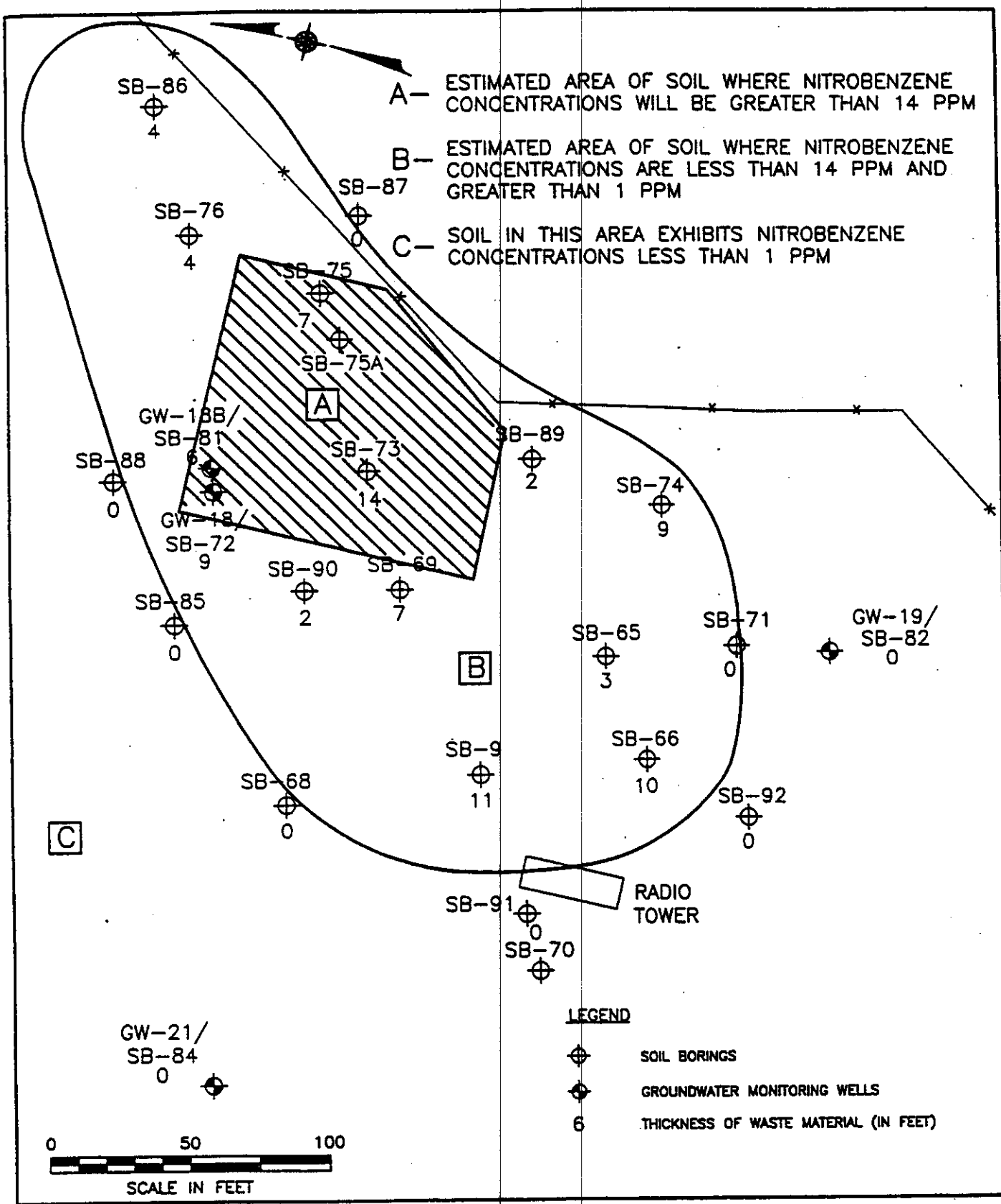


Buffalo Outer Harbor/Radio Tower Area
Site No. 9-15-026

FIGURE 2 - Site Map

LEGEND

- INVESTIGATION AREA BOUNDARY
- FENCE LINES
- SITE BOUNDARY RTA
- APPROXIMATE DELINEATION OF FUHRMANN BLVD. LANDFILL
- GRAVEL PARKING AREA



BUFFALO OUTER HARBOR/ RADIO TOWER AREA
BUFFALO, NEW YORK
Site No. 9-15-026

AREA REQUIRING REMEDIATION

FIGURE 3

DWG: 1307 FILE: 1307GC-2 NH-7/13/98

Table 1A
Subsurface Soil Contaminants
All Concentrations Reported in PPM (mg/kg)

Contaminants	Maximum Concentration Detected	Average Concentration	NYSDEC Cleanup Goals	Frequency of On-Site Sample Results Exceeding Cleanup Goals
Volatile Organics				
Total VOC's	350	92	10(1)	2/7
Semivolatile Organics				
Nitrobenzene	13,000	450	14(2)	9/20
Inorganics				
Antimony	5,500	450	ND-10(4)	6/15

Table 1B
Surface Soil Contaminants
All Concentrations Reported in PPM (mg/kg)

Contaminants	Maximum Concentration Detected	Average Concentration	NYSDEC Cleanup Goals	Frequency of On-Site Sample Results Exceeding TAGM 4046 Cleanup Goals
PCBs				
Total PCBs	8.2	2.4	1.0(3)	4/8
Inorganics				
Lead	777	390	400(4,5)	4/8
Zinc	2,350	1,164	400(4)	5/8

(1) NYSDEC TAGM 4046
(2) USEPA Land Disposal Restriction
(3) NYSDOH recommended cleanup goal
(4) Site specific background concentration
(5) USEPA health-based recommended cleanup value for industrial areas

Table 1C
Radio Tower Area Groundwater Contaminants
All Concentrations Reported in PPB (ug/l)

Contaminants	Maximum Concentration Detected	NYSDEC Class GA Groundwater Standards	Number of Wells Exceeding Class GA Groundwater Standards
Volatiles			
Benzene	15	0.7	2/4
Chlorobenzene	170	5	2/4
Di Chlorobenzene (Total)	300	5	2/4
Semi-Volatiles			
4-Chloroaniline	3600	5	2/4
Inorganics			
Antimony	244	3	1/4
Lead	28	25	3/4

CONTAMINANT SUMMARY
BUFFALO OUTER HARBOR PROPERTY

SITE AREAS	MATRIX	TOTAL NUMBER OF EXCEEDANCES	CONTAMINANT SUMMARY				
			CONTAMINANT	HIGHEST LEVELS(2)	SCREENING LEVELS	AVERAGE LEVELS	NO. OF EXCEEDANCES
SOUTH OF BELL SLIP **Radio Tower Area**	Surface soil (0 to 6 inches)	5 out of 8 samples above the screening level	PCBs Cadmium Lead Zinc Nickel	8.2 mg/kg 12 mg/kg 777 mg/kg 2350 mg/kg 47.9 mg/kg	1 mg/kg 10 mg/kg 500 mg/kg 500 mg/kg 40 mg/kg	2.4 mg/kg 5.8 mg/kg 390 mg/kg 1164 mg/kg 24.6 mg/kg	4 out of 8 1 out of 8 4 out of 8 5 out of 8 1 out of 8
	Shallow Subsurface soil (6 inches to 8 feet)	5 out of 13 samples above the screening level	CaPAHs Lead Antimony	112 mg/kg 1170 mg/kg 29 mg/kg	10 mg/kg 500 mg/kg 20 mg/kg	13.2 mg/kg 314 mg/kg 11.5 mg/kg	2 out of 13 2 out of 13 1 out of 13
	Deep Subsurface soil (8 to 20 feet)	7 out of 15 samples above the screening level	Total VOCs Nitrobenzene PAHs CaPAHs Antimony Lead Chromium Nickel Copper Zinc TCLP Nitrobenzene TCLP 2,4-Dinitrotoluene	351 mg/kg 13,000 mg/kg 5600 mg/kg 16 mg/kg 5470 mg/kg 1720 mg/kg 2820 mg/kg 123 mg/kg 1480 mg/kg 1290 mg/kg 91 mg/l 0.6 mg/l	10 mg/kg 1 mg/kg 100 mg/kg 10 mg/kg 20 mg/kg 500 mg/kg 100 mg/kg 40 mg/kg 200 mg/kg 500 mg/kg 2 mg/l 0.3 mg/l	92.7 mg/kg 79.4 mg/kg 406 mg/kg 2.9 mg/kg 439 mg/kg 296 mg/kg 218 mg/kg 23 mg/kg 140 mg/kg 253 mg/kg — —	2 out of 7 5 out of 15 2 out of 15 1 out of 15 6 out of 15 2 out of 15 2 out of 15 1 out of 15 1 out of 15 1 out of 15 1 out of 2 1 out of 2
	Groundwater (depth to groundwater 8 feet)	1 out of 1 samples above the screening level for Phase I investigation 3 out of 5 samples above the screening level for the Phase II investigation	Benzen Toluene Chlorobenzene 1,3 Dichlorobenzene 1,4 Dichlorobenzene 1,2 Dichlorobenzene Napthalene 4-Chloroaniline ~~Antimony~~ Lead Arsenic	15 ug/l (Phase I) 7 ug/l (Phase I) 170 ug/l (Phase I) 150 ug/l (Phase II) 33 ug/l (Phase II) 150 ug/l (Phase II) 890 ug/l (Phase I) 3600 ug/l (Phase II) ~~244 ug/l (Phase I)~~ 28.4 ug/l (Phase II) 159 ug/l (Phase II)	0.7 ug/l 5 ug/l 5 ug/l 5 ug/l 4.7 ug/l 4.7 ug/l 10 ug/l 5 ug/l ~~3 ug/l~~ 25 ug/l 25 ug/l	— — — — — — — — — — —	— — — — — — — — — — —
Remaining Area	Surface soil (0 to 6 inches)	20 out of 43 samples above the screening level	CaPAHs Arsenic Zinc Lead Cadmium Chromium Cooper	80 mg/kg 1301 mg/kg ~~3080 mg/kg~~ 834 mg/kg 27 mg/kg 133 mg/kg 456 mg/kg	10 mg/kg 20 mg/kg ~~500 mg/kg~~ 500 mg/kg 10 mg/kg 100 mg/kg 200 mg/kg	10 mg/kg 8 mg/kg ~~414 mg/kg~~ 220 mg/kg 2.7 mg/kg 29 mg/kg 81 mg/kg	11 out of 43 2 out of 43 ~~8 out of 43~~ 4 out of 43 1 out of 43 2 out of 43 3 out of 43
	Shallow Subsurface soil (6 inches to 8 feet)	8 out of 12 samples above the screening level	CaPAHs Arsenic Lead Nickel Zinc	16 mg/kg 36 mg/kg 1260 mg/kg 63 mg/kg 834 mg/kg	10 mg/kg 20 mg/kg 500 mg/kg 40 mg/kg 500 mg/kg	5.7 mg/kg 8.7 mg/kg 345 mg/kg 24 mg/kg 372 mg/kg	4 out of 12 1 out of 12 2 out of 12 1 out of 12 4 out of 12
	Deep Subsurface soil (8 to 20 feet)	6 out of 13 samples above the screening level	CaPAHs PAHs Lead Antimony Arsenic Copper Nickel Zinc	31 mg/kg 104 mg/kg 2200 mg/kg 74 mg/kg 21.4 mg/kg 247 mg/kg 53 mg/kg 1880 mg/kg	10 mg/kg 100 mg/kg 500 mg/kg 20 mg/kg 20 mg/kg 200 mg/kg 40 mg/kg 500 mg/kg	9.6 mg/kg 25.8 mg/kg 283 mg/kg 19 mg/kg 7.8 mg/kg 43 mg/kg 23 mg/kg 317 mg/kg	4 out of 13 1 out of 13 2 out of 13 1 out of 13 1 out of 13 1 out of 13 1 out of 13 1 out of 13
	Groundwater (depth to groundwater 8 feet)	5 out of 11 samples above the screening level for the Phase I investigation 0 out of 1 samples above the screening level for the Phase II investigation	Chloroform Endrin 4,4-DDT 4,4-DDD Arsenic	15 ug/l (Phase I) 0.024 ug/l (Phase I) 0.039 ug/l (Phase I) 0.069 ug/l (Phase I) 95 ug/l (Phase I)	7 ug/l Non-detect Non-detect Non-detect 25 ug/l	— — — — —	— — — — —
NORTH OF BELL SLIP **West of Asphalt Road**	Surface Soil (0 to 6 inches)	4 out of 34 samples above the screening level	CaPAHs Lead Zinc	18 mg/kg 815 mg/kg 671 mg/kg	10 mg/kg 500 mg/kg 500 mg/kg	3.6 mg/kg 157 mg/kg 151 mg/kg	3 out of 34 2 out of 34 1 out of 34
	Shallow Subsurface Soil (6 inches to 8 feet)	6 out of 19 samples above the screening level	CaPAHs Lead Copper Nickel Zinc	18.4 mg/kg 1160 mg/kg 753 mg/kg 55.6 mg/kg 1010 mg/kg	10 mg/kg 500 mg/kg 200 mg/kg 40 mg/kg 500 mg/kg	3.8 mg/kg 173 mg/kg 123 mg/kg 15.4 mg/kg 190 mg/kg	3 out of 19 1 out of 19 2 out of 19 1 out of 19 1 out of 19

Table 2 .
CONTAMINANT SUMMARY
BUFFALO OUTER HARBOR PROPERTY

SITE AREAS	MATRIX	TOTAL NUMBER OF EXCEEDANCES	CONTAMINANT SUMMARY				
			CONTAMINANT	HIGHEST LEVELS(2)	SCREENING LEVELS	AVERAGE LEVELS	NO. OF EXCEEDANCES
West of Asphalt Road (continued)	Deep Subsurface soil (8 to 20 feet)	10 out 20 samples above the screeening level	CaPAHs Lead Antimony Copper Chromium Arsenic Cadmium Nickel Zinc	38 mg/kg 2850 mg/kg 89 mg/kg 12900 mg/kg 569 mg/kg 57.8 mg/kg 32.6 mg/kg 747 mg/kg 5290 mg/kg	10 mg/kg 500 mg/kg 20 mg/kg 200 mg/kg 100 mg/kg 20 mg/kg 10 mg/kg 40 mg/kg 500 mg/kg	9.1 mg/kg 643 mg/kg 19.4 mg/kg 902 mg/kg 66 mg/kg 16.2 mg/kg 48 mg/kg 75 mg/kg 923 mg/kg	5 out of 18 8 out of 20 2 out of 18 10 out of 20 2 out of 18 5 out of 18 2 out of 18 4 out of 18 10 out of 20
	Groundwater (depth to groundwater ranges from 5 to 15 feet)	6 out 12 samples above the screeening level for the Phase I investigation 3 out 6 samples above the screeening level for the Phase II investigation	Antimony Barium Trichloroethene Cyanide Dieldrin Endrin Heptachlor Epoxide Beta BHC	124 ug/l (Phase I) 4050 ug/l (Phase I) 7 ug/l (Phase I) 892 ug/l (Phase II) 0.032 ug/l (Phase I) 0.018 ug/l (Phase I) 0.026 ug/l (Phase I) 0.011 ug/l (Phase I)	3 ug/l 25 ug/l 1000 ug/l 5 ug/l 100 ug/l Non detect Non detect Non detect	— — — — — — — —	— — — — — — — —
East of Asphalt Road	Surface soil (0 to 6 inches)	4 out 23 samples above the screeening level	CaPAHs Copper Zinc	18 mg/kg 29,500 mg/kg 874 mg/kg	10 mg/kg 200 mg/kg 500 mg/kg	2.2 mg/kg 62 mg/kg 205 mg/kg	1 out of 23 1 out of 23 2 out of 23
	Shallow Subsurface soil (6 inches to 8 feet)	8 out 15 samples above the screeening level	CaPAHs Antimony Arsenic Lead Copper Nickel Zinc	17 mg/kg 37 mg/kg 34 mg/kg 1200 mg/kg 1460 mg/kg 48.1 mg/kg 4230 mg/kg	10 mg/kg 20 mg/kg 20 mg/kg 500 mg/kg 200 mg/kg 40 mg/kg 500 mg/kg	2.7 mg/kg 16.7 mg/kg 10.6 mg/kg 389 mg/kg 673 mg/kg 19.2 mg/kg 968 mg/kg	1 out of 13 2 out of 13 3 out of 13 6 out of 15 5 out of 15 2 out of 13 5 out of 15
	Deep Subsurface soil (8 to 20 feet)	12 out 15 samples above the screeening level	CaPAHs Arsenic Antimony Cadmium Chromium Copper Lead Nickel Zinc	38 mg/kg 412 mg/kg 1170 mg/kg 27 mg/kg 343 mg/kg 1560 mg/kg 4860 mg/kg 141 mg/kg 4330 mg/kg	10 mg/kg 20 mg/kg 20 mg/kg 10 mg/kg 100 mg/kg 200 mg/kg 500 mg/kg 40 mg/kg 500 mg/kg	9.1 mg/kg 41.7 mg/kg 133 mg/kg 6.4 mg/kg 58 mg/kg 432 mg/kg 1165 mg/kg 38 mg/kg 1036 mg/kg	3 out of 15 5 out of 15 6 out of 15 3 out of 15 2 out of 15 5 out of 15 10 out of 15 4 out of 15 7 out of 15
	Groundwater (depth to groundwater 10 feet)	3 out 5 samples above the screeening level for the Phase I investigation 1 out 2 samples above the screeening level for the Phase II investigation	VOCs PAHs Zinc Lead Thallium Barium	Low levels of VOCs (Less than 10 ug/l Phase I) Low levels of PAHs (less than 5 ug/l Phase I and Phase II) 349 ug/l (Phase I) 410 ug/l (Phase II unfiltered) 7.2 ug/l (Phase II unfiltered) 1090 ug/l (Phase II unfiltered)	Various Class GA groundwater sandards/guideline 300 ug/l 25 ug/l 4 ug/l 1000 ug/l	— — — — — —	— — — — — —
Eastern Gravel Parking Area	Surface soil (0 to 6 inches)	8 out 14 samples above the screeening level	PCBs CaPAHs Arsenic Cadmium Chromium Lead Nickel Zinc	12 mg/kg 14.8 mg/kg 21.3 mg/kg 323 mg/kg 113 mg/kg 14000 mg/kg 62.8 mg/kg 29800 mg/kg	1 mg/kg 10 mg/kg 20 mg/kg 10 mg/kg 100 mg/kg 500 mg/kg 40 mg/kg 500 mg/kg	1.3 mg/kg 6.1 mg/kg 8.6 mg/kg 25.9 mg/kg 32 mg/kg 623 mg/kg 19.4 mg/kg 946 mg/kg	2 out of 14 3 out of 14 1 out of 14 2 out of 14 1 out of 14 6 out of 14 1 out of 14 5 out of 14
	Groundwater (depth to groundwater 17 feet)	1 out 1 samples above the screeening level for the Phase I and Phase II investigation	Chrysene Lead Thallium	0.6 ug/l (Phase II) 500 ug/l (Phase II) 6.3 ug/l (Phase II)	0.002 ug/l 25 ug/l 4 ug/l	— — —	— — —

Table 3 **Influence of soil treatments on nitrobenzene concentrations in Buffalo Outer Harbor soil.**

TREATMENT METHODOLOGY	Initial* (t=0) (ppm)	1 cycle (14 days)	2 cycles (28 days)	2.5 cycles (35 days)	3 cycles (42 days)	4 cycles* (56 days) (ppm)	Reduction Rel. to Initial
Air Dried Control	433	1600	827	820	985	473 (15)	-
Cycled 1	433	484	110	15.9	30.5	11 (21)	97.4%
Cycled 2	433	463	180	27.8	33.8	6.9 (77)	98.4%
Cycled 3	433	293	106	26.1	19.6	3 (42)	99.3%
Cycled 4	433	97.8	15.4	19.2	17.5	2.9 (31)	99.3%
Cycled 5	433	241	56.6	25.7	39.7	45 (163)	89.6%
Cycled 6	433	219	158	15.1	19.5	5.7 (23)	98.7%
Aerobic 1	433	601	443	623	521	185 (50)	57.3%
Aerobic 2	433	638	608	542	670	277 (45)	36.1%
Aerobic 3	433	450	1090	703	600	257 (20)	40.8%

Values in parenthesis represent CoV - Coefficient of Variance (st. dev. / mean x 100) of data set.
Underlined values represent % reductions that are not stastistically significant.
Bold values indicate attainment of remediation criteria for nitrobenzene.

Site No. 9-15-026
Buffalo Outer Harbor/Radio Tower Area
Results of Bio Remediation
Treatability Study

Table 4
Buffalo Outer Harbor/Radio Tower Area
Phase I and II Remedial Investigation
Soil Boring Sample Results

TCLP Semivolatile Extraction			
Sample ID	SB-66A	SB-73A	Maximum Allowable Level (mg/l)
Date of Collection	7/21/97	7/22/97	
TCLP Constituents	(mg/l)	(mg/l)	
Pentachlorophenol	U	U	100
2,4,5 - Trichlorophenol	U	U	400
2,4,6 - Trichlorophenol	U	0.025 J	2
2-Methylphenol	U	U	200
3-and/or 4-Methylphenol	U	U	200
Hexachlorobenzene	U	U	0.13
Hexachlorobutadiene	U	U	0.5
Hexachloroethane	U	U	3
Nitrobenzene	U	210 D	2
1,4-Dichlorobenzene	U	0.11	7.5
2,4-Dinitrotoluene	U	U	0.13
Pyridine	U	U	5

TCLP Constituents			
Sample ID	SB-66A	SB-73A	Maximum Allowable Level (mg/l)
Date of Collection	7/21/97	7/22/97	
TCLP Constituents	(mg/l)	(mg/l)	
Arsenic	U	U	5.0
Barium	0.38 B	0.24 B	100
Cadmium	U	U	1.0
Chromium	U	0.0028 B	5.0
Lead	0.0022 B	0.0033 B	5.0
Mercury	U	U	0.2
Selenium	U	0.0086 B	1.0
Silver	U	U	5.0

Qualifiers
U: Compound analyzed for but not detected
B: Constituent found above the IDL but below the CRDL
E: Result qualified as estimated based on validation criteria

Notes
Value exceeds Maximum Allowable Level

APPENDIX A
Buffalo Outer Harbor/Radio Tower Area
Responsiveness Summary

Questions received during the February 17, 1999 public meeting, with DEC's responses:

Q1. How contaminated is the Outer Harbor property outside of the Radio Tower Area (RTA)?

A. The Buffalo Outer Harbor property was thoroughly investigated and found to contain contamination that is typical of urban areas. Low level of metals, Polyaromatic Hydrocarbons (PAHs) and Polychlorinated Biphenyls (PCBs) were detected sporadically throughout the property. There were inconsequential amounts of regulated hazardous waste and therefore the property other than the RTA was removed from the site definition in the Registry of Inactive Hazardous Waste Disposal Sites (registry).

Q2. Where does this leave the rest of the site in terms of future use?

A. Any decisions on future use or development of the Buffalo Outer Harbor property outside of the RTA is in the hands of the Niagara Frontier Transportation Authority (NFTA), as property owner, and local planning and zoning authorities as part of their normal roles in the development process.

Q3. The RI report noted PCB contamination in the surface soils of the RTA. Are there PCBs in the rest of the site?

A. In the vicinity of the Radio Tower PCBs were detected as high as 8.2 ppm. Other sporadic detections of PCBs were found in the surface soils of the Outer Harbor property. At the eastern gravel parking area on the north end of the Outer Harbor property PCB was detected at 12 ppm.

Q4. Does release from the New York State Registry of Inactive Hazardous Waste Sites mean NYSDEC is not concerned with future development?

A. The Outer Harbor property was excluded from the registry site definition because no consequential amounts of hazardous waste were found. The future use of the site should consider the presence of contamination at lower levels as detailed in the RI/FS reports.

Q5. Page 17 of the PRAP refers to the USEPA level for nitrobenzene of 39 ppm that is allowable to support residential development. What is the background of this number?

A. The USEPA Region III office has developed Risk Based Concentrations (RBCs) for contaminants in industrial or residential use. The RBC concentration published in October 1997 for nitrobenzene exposure through soil ingestion in residential use is 39 ppm. DEC has not adopted EPA's RBC criteria for Superfund remediation.

Q6. Is 300 -700 ppm of lead typical for urban areas?

A. Yes, these levels are typical of urban areas unassociated with waste disposal.

Q7. How was the decision made to use Grace Bioremediation Technologies for the bioremediation pilot study?

A. A request for proposal was sent out seeking qualified vendors. Grace's proposal was determined by DEC to be the best based on their successful experience in treating similar contaminants.

Q8. Does the PRAP contemplate another process other than Grace?

A. The remedy selection process does not restrict the remedial vendor to only Grace. Other vendors who can demonstrate success in meeting cleanup objectives could be used. Final vendor selection may be based on additional experience and pilot testing. Should bioremediation vendors not be able to provide a guarantee for meeting the site cleanup objective or should the cost of implementing a full scale bioremediation prove non cost effective, the contingency to use low temperature thermal desorption will be implemented.

Q9. How did DEC conclude EPA risk based cleanup criteria was not acceptable?

A. The DEC has not adopted EPA's Risk Based Concentrations (RBCs) as criteria for State superfund remediation. Additionally, for the RTA Site it was also determined that the RBC for nitrobenzene, 39 ppm, would not be sufficient to provide for disposal of treated soils in the most cost effective manner. Cleanup to the USEPA Land Disposal Restriction limit of 14 ppm will be protective of health and the environment, will provide added regulatory flexibility that allows cost effective disposal, and is achievable by the selected treatment technology.

Q10. What is the difference in cost between achieving cleanup to 1 ppm versus 14 ppm for nitrobenzene?

A. Approximately 10,000 additional yards of soil would require remediation to achieve a nitrobenzene cleanup objective of 1 ppm. Bioremediation would be ruled out, thermal desorption would be required and total cost for the project could triple current estimates.

Q11. How will groundwater from the excavation dewatering be treated?

A. This will be determined during final design. However, it is likely that the water will be pretreated with carbon prior to discharge to the city sanitary system.

Q12. What is the estimated volume of water?

A. Dewatering of the 150' x 150' area is projected to result in approximately 30,000 gallons of water when tight sheeting is used.

Q13. The 14 ppm was selected to allow redeposition of soil after treatment. What happens if the soil doesn't reach 14 ppm? Does that mean the soil must be disposed of in a hazardous waste landfill?

A. First, the remedial vendor will be contractually held to achieving the remedial objective of treatment to the USEPA Land Ban criteria of 14 ppm nitrobenzene. However in the event the treatment technology is not completely successful, NYSDEC TAGM 3028 provides a regulatory limit that will allow soil containing nitrobenzene above the treatment level of 14 ppm but below 40 ppm to be disposed of in a solid waste landfill.

Q14. Levels of nitrobenzene as high as 13,000 ppm were detected onsite. How do we know that bioremediation can deal with this?

A. Levels of contamination at that level would likely poison the microbes needed for the bioremediation process. Screening and blending of the soil as part of the process would produce an average input concentration low enough for the bioremediation process to work.

Q15. If the volume of water to be treated is greater than 30,000 gallons, won't costs for the project go up?

A. Yes, however this is not one of the major cost items of the remedy. Excavation and soil treatment drive the project cost. Increases in volume of water to be treated would not significantly impact the cost or timing of the project.

Q16. Is the DEC no longer involved in the rest of the Outer Harbor property?

A. The DEC is no longer involved with the remaining portion of the Outer Harbor property. This area has been removed from the site definition that is in the Registry of Inactive Hazardous Waste Disposal Sites.

Q17. Are there other environmental regulatory control mechanisms that may effect the future use of the Outer Harbor property?

A. Future use of the Outer Harbor is subject to local planning and the State Environmental Quality Review (SEQR) process. The NFTA is a municipal authority that is eligible for a State Environmental Restoration (Brownfield) grant. If NFTA chooses to pursue a Brownfield grant they will be subject to the NYSDEC program, and its own set of requirements and regulations for site cleanup and reuse.

Q18. Does the Buffalo Outer Harbor property qualify for the new hazardous substance list?

A. The property is currently not on the hazardous substance site list, but potentially could be added since the list is periodically reviewed and updated.

Q19. What uncertainties exist with regard to the proposed remedy. Shouldn't they be resolved.

A. Not all uncertainties are resolved by the FS and remedy selection process. Major elements of the remedy such as the excavation techniques and treatment technologies were evaluated to reduce uncertainty over the projected cost for these major elements of the remedy during the FS. However, the remedial plan is subject to a detailed design that will verify all elements of the selected plan and prepare contract documents for competitive bidding.

Q20. What is the risk of disturbing the contamination? Seems that the problem will be made worse by the construction.

A. Excavation using a tight sheeting method housed in a fabric building will reduce/address much of this concern. The spreading of the contamination during remediation is considered unlikely given the confinement of the work area by interlocking steel.

Q21. What is the cost of the building? Is it under negative pressure? Is air treatment required?

A. Final details for the building are subject to a detailed design process. All issues related to the health and safety of the community and site workers will be revisited during design. For the FS a total cost of $2,000,000 was estimated for the excavation, backfilling, safety enclosure, and worker protection.

Q22. Who is going to design and implement the selected remedy? Will it be the NFTA?

A. PRP's will be offered the opportunity to conduct the remediation.

Q23. What is the depth of the proposed sheet piling?

A. For the purpose of estimating the cost of the remedy the sheet piling will be installed below the level of contamination into an underlying clay till that is an average 25 feet below grade. Final geotechnical details of the sheet piling is subject to remedial design.

Q24. Has the State evaluated the use of freeze walls in lieu of steel sheet piling?

A. No, for the purpose of evaluating alternatives only steel sheeting was used. Alternative control methods such as freeze walls could be evaluated during remedial design.

Q25. What if the Buffalo Sewer Authority has problems and prevents the groundwater from entering their system for treatment.

A. Two alternates are available, first the water from the excavation could be treated to prescribed treatment limits and discharged to Lake Erie or the water could be placed in tanker trucks and hauled off site for disposal. Resolution to this question is to be finalized during the remedial design.

Q26. How does this site rank in priority with other State Superfund sites in Buffalo?

A. This site is one of approximately 60 Class 2 sites in Erie County. Each site is handled individually and active remediation begins only after either a consent order is signed with a PRP or a referral to State Superfund is made by State attorneys. It is difficult to rank the sites since environmental conditions are not fully identified until the site remedial investigation is completed. The Buffalo Outer Harbor Site went through an exhaustive investigation which resulted in removal of over 100 acres of the property from the site definition included in the registry. The radio tower area poses a potential significant threat from the presence of hazardous waste and should be remediated.

Q27. Has a cost/benefit analysis been preformed to justify the 3 million dollar expenditure on the site.

A. No. Cost/benefit ratios are specifically not part of the remedial selection criteria. Instead, NCP threshold criteria such as compliance with SCG's as well as overall protection of human health and the environment, long term protectiveness and the State's preference for permanence are used to determine the need for remediation. Cost is factored into the selection process as a criteria for selecting between 2 or more alternatives that effectively satisfy the other selection criteria.

Following the Public Meeting, three comment letters were received. These three letters are attached to the end of the Responsiveness Summary.

Letters received from the Niagara Frontier Transportation Authority:

Two letters, dated March 11 and 12, 1999 were submitted by Mr. Kevin McCarthy of the Niagara Frontier Transportation Authority (NFTA). The March 11, 1999 letter transmitted an August 1998 hydrology report prepared by McMahon and Mann for the proposed Port Terminal expansion at the Buffalo Outer Harbor property. The March 12, 1999 letter was a follow up that indicated the hydrology report was being submitted for use in remedial design to assist in finalizing details regarding the handling of construction water during excavation activities. The March 11 letter also expressed some concern that the proposed remedy may not be feasible due to excessive costs caused by large volumes of water to be handled during remedial construction.

The NYSDEC appreciates the information submitted by the NFTA and will provide this information to the remedial design engineer for his/her consideration.

There is a difference in the volumes of water projected to occur during dewatering between the Feasibility Study and PRAP and the McMahon and Mann hydrology report. However, we do not believe there is cause for altering the selected remedy. The McMahon and Mann estimate was for an area that is 3 times the total area to be excavated under the proposed alternative. The McMahon and Mann estimates were based on an area of 200 x 350 feet for a total of 70,000 sq. ft. The PRAP calls for a more limited area of 150 x 150, or 22,500 sq. ft. There is also a possibility that the excavation will proceed in small segments to further reduce the overall dewatering. Furthermore, the cost of pretreating groundwater from the excavation is not a major component of the remedial cost when compared to the cost of the sheeting, excavation and treatment of soil.

Letter received from Mr. David Flynn, on behalf of Allied Signal:

Mr. David Flynn, Esq., submitted a March 12, 1999 letter on behalf of Allied Signal Inc. with respect to the Proposed Remedial Action Plan (PRAP) for the Buffalo Outer Harbor Site/Radio Tower Area (RTA). The following responses are made in the order of comments provided in Mr. Flynn's letter.

I. Comment: As no complete human or ecological pathways exist at the site, no remediation should be required at this time.

Response: The PRAP page 13 (now page 11 of the ROD) states that the RTA under current conditions does not pose a significant threat to human health. However, there is potential for completed pathways should increases in site use and inappropriate or uncontrolled site development occur at the RTA or in the vicinity of the RTA. The RTA and adjacent property is considered prime property for waterfront development and it is reasonably foreseeable that, with the anticipated increases in use or site development, completed migration pathways or exposure could occur if the site remains unremediated. Additionally, the presence of these hazardous wastes raises the concern, and reasonably so, that failure to remediate the RTA would hinder to a significant extent the enjoyment or use of the property.

II. Comment: NYSDEC is inappropriately applying its SCGs to the Site.

Response: Standards, criteria and guidelines (SCGs) are to be considered when formulating, screening and evaluating remedial alternatives. The NYSDEC evaluated the feasibility of achieving nitrobenzene cleanup to TAGM 4046 levels (0.2 ppm) but found significant technical factors that mitigate against this cleanup standard. These factors are laid out on page 16 of the PRAP. Application of the Federal Land Ban criteria for nitrobenzene (14 ppm) as the clean up goal for site soil allows for a greater range of cost effective remedial technologies while being fully protective of human health and the environment and meeting other threshold criteria. Groundwater has been impacted by waste disposal at the RTA as noted on Page 9 of the PRAP. Chlorobenzenes, naphthalene, 4-chloroaniline and antimony have been detected in the groundwater wells downgradient of the remediation area. These contaminants are likely associated with the disposal of the nitrobenzene sludge. Though nitrobenzene was not detected in the downgradient well, it would not be unanticipated that a groundwater monitoring well located directly within the nitrobenzene remedial zone would be significantly contaminated. The fact that the nitrobenzene is not readily migrating in the dissolved phase has allowed the NYSDEC to select a remedy that features source removal and treatment without an active groundwater pump and treat component.

III. Comment: The selection of Alternative 5 as a contingent final remedy for the site may be inappropriate due to potential land ban consideration.

Response: The NYSDEC evaluation of the bioremediation technology demonstrated by the pilot study conducted by Grace Bioremediation Technologies has concluded that a full scale bio process can be properly designed and implemented that will meet the site cleanup goal and achieve the Land Disposal Restrictions (i.e. Land Ban criteria).

IV. **Comment:** A revised alternative 2 should be selected as a final remedy by NYSDEC.

Response: Alternative 2 would not be fully protective of human health or the environment under reasonably foreseeable increased land use especially since high concentrations of hazardous wastes are present at the site. The measures suggested in your letter, while commonly used to deal with residual contamination following remediation, are not sufficiently protective to use as the sole remedial measure for toxic hazardous waste in the high concentration levels at this site. Alternative 2 does not meet NYSDEC's preference for alternatives that permanently and significantly reduce the toxicity, mobility or volume of waste at the site.

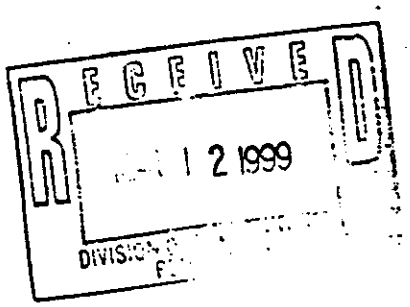
V. **Comment:** There was no Comment V in the letter received from Mr. Flynn.

VI. **Comment:** The unusual history of the site further supports selection of a revised Alternative 2 remedy.

Response: The NYSDEC will review and evaluate any information or documentation which it receives with discovery concerning waste disposal at the Site. For the present, however, the Department believes the documentation supports designation of Allied Signal as a site PRP and that the potential significant threat at the Site should be addressed by the proposed remedial plan.

NIAGARA FRONTIER TRANSPORTATION AUTHORITY

March 11, 1999



Mr. Gary E. Kline, P.E.
Project Manager
Technical Support Section
Bureau of Western Remedial Action
NYS Dept. of Environmental Conservation
50 Wolf Road
Albany, New York 12233-7010

Dear Mr. Kline:

As a follow up to the public meeting held in Buffalo on February 17, 1999, please allow this letter to serve as our preliminary comments with regard to the Proposed Remedial Action Plan (PRAP) for Site No. 9-15-026.

Due to a request made by our major tenant located at the Port Terminal, to expand their facility, certain reports were prepared to investigate the feasibility of constructing a large warehouse and distribution facility on the Buffalo Outer Harbor site that would include the subject contaminated area. The reports were prepared in two phases, one being a geotechnical study to determine depth and load capacity of the soils including the depth to bedrock. Since these tests required drilling rig use, the opportunity was taken to also investigate hydraulic conductivity. This testing was performed by McMahon & Mann Consulting Engineers, P.C. for DiDonato Associates, P.E., P.C. on behalf of Euro United, the NFTA tenant.

The PRAP requires de-watering of the effected area in order to excavate contaminated soil and the concentrated sludge. We attached for your review the hydrology report prepared by McMahon & Mann. It should serve as a valuable tool to help determine the real costs that could occur if the PRAP is executed. At the public meeting on February 17 it was stated that, for budgetary planning purposes, 30,000 gallons of water would be generated in order to effectively excavate the site. You will note that the McMahon & Mann report estimates that over 1.5 million gallons of water are expect to be generated as a result of this excavation. The disparity between the 30,000 gallon budget estimate versus the 1.5 million gallon volume based upon field tests, creates some concern that the PRAP may not be feasible due to excessive costs.

181 Ellicott Street Buffalo, N.Y. 14203 716/855-7300 Telefax: 716/855-7657 TDD: 716/855-7650

Nonetheless, we supply your office with the above referenced report so that you may review the information contained therein and use it as appropriate. The comments made above are not all inclusive and the NFTA requests the ability to review comments made by other interested parties before any Record of Decision is issued. We will make ourselves and our consultants available at your convenience to finalize any comments that remain after the comment review period. Please feel free to contact me at (716) 855-7237.

Sincerely,

Kevin T. McCarthy
Director, Property Group

KTM/pjr
Enclosure

cc: Mr. D. Gregory
Ms. C. Locklear
Mr. M. Clark

NIAGARA FRONTIER TRANSPORTATION AUTHORITY

March 12, 1999

Mr. Gary E. Kline, P.E.
Project Manager
Technical Support Section
Bureau of Western Remedial Action
NYS Dept. of Environmental Conservation
50 Wolf Road
Albany, New York 12233-7010

Dear Mr. Kline:

Please allow the following remarks to clarify our comments which were submitted to your office on March 11.

The purpose of supplying the McMahon & Mann report was to assist the DEC in the final engineering design in order to accomplish the Proposed Remedial Action Plan (PRAP). It is our hope that by having your design engineers review this report, they may be able to consider the hydrology of the site early on in the process. The purpose of our comments was to inform you of the report and its findings, not to question the overall PRAP choice calling for bioremediation and/or thermal desorption.

We acknowledge your position that the comment period ends on March 12 and that we will not be able to amend our comments regarding the PRAP by virtue of having reviewed other parties' comments. If you have any questions, please contact me.

Sincerely,

Kevin T. McCarthy
Director, Property Group

KTM/pjr

cc: Mr. D. Gregory
Ms. C. Locklear
Mr. M. Clark

181 Ellicott Street Buffalo, N.Y. 14203 716/855-7300 Telefax: 716/855-7657 TDD: 716/855-7650

PHILLIPS, LYTLE, HITCHCOCK, BLAINE & HUBER LLP

ATTORNEYS AT LAW

3400 MARINE MIDLAND CENTER, BUFFALO, NEW YORK 14203

(716) 847-8400 • FAX: (716) 852-6100

BUFFALO • FREDONIA • JAMESTOWN • NEW YORK • ROCHESTER

DAVID P. FLYNN
PARTNER

(716) 847-5473
dflynn@phillipslytle.com

March 12, 1999

Gary E. Kline, P.E.
Project Manager
Technical Support Section
Bureau of Western Remediation
New York State Department of
Environmental Conservation
50 Wolf Road
Albany, NY 12233

Re: Proposed Remedial Action Plan
Buffalo Outer Harbor (Radio Tower Area)

Dear Mr. Kline:

We are submitting these comments on behalf of AlliedSignal Inc. ("AlliedSignal") with respect to the Proposed Remedial Action Plan ("PRAP") for the Buffalo Outer Harbor Site (Radio Tower Area) ("Site") dated February, 1999. By submitting these comments AlliedSignal is not admitting that it is a PRP with respect to the Site or is liable for any Site response costs. We request that these comments be considered by the New York State Department of Environmental Conservation ("NYSDEC") in its remedy selection process for the Site. Further, we request that these comments be included in the administrative record for the Site.

x x x

We have reviewed the Site file, the RI/FS for the Site as well as the PRAP. While we appreciate that the Department has conducted an extensive remedial investigation and are in general agreement with the technical findings, we believe that NYSDEC's proposed remedy must be modified. The remedy in the form proposed is inconsistent with the provisions of the New York Environmental Conservation Law, the regulations promulgated thereunder and NYSDEC's own relevant policies and guidances and

selecting the "preferred alternative" set out in the PRAP as the final remedy for the Site would be an arbitrary and capricious act by the Department. Accordingly, for the reasons set out below, the selected remedy should be a modified remedial alternative 2 that provides for deed and access restrictions and periodic monitoring until such time as future development requirements are defined and the need for excavation and treatment of the contaminants can be determined.

I. As no complete human or ecological pathways exist at the site, no remediation should be required at this time.

The RI determined that an approximate 150' x 150' area, at depths starting at 10 fbgs, contains a material which may be considered a characteristic hazardous waste. Importantly, the RI concluded that any groundwater impacted by this material was extremely localized and essentially stationary. Of particular interest, the primary constituent of concern identified in the RI (nitrobenzene) was not detected "even though this contaminant is the most prevalent organic contaminant in the soil..." (PRAP at page 11). The RI concluded that surface water and sediment in the vicinity of the Site were not impacted by Site-specific constituents of concern.

In addition to concluding that these materials identified are not materially impacting any environmental media at or near the Site, the Qualitative Risk Assessment ("RA") performed for the Site did not identify a single existing complete exposure pathway, either human or ecological, for these materials. In summary, the RA concluded that the materials pose no risk from a qualitative perspective. The only potential for a future complete exposure pathway that the RA identified was "increases in site use and inappropriate or uncontrolled site development." (PRAP at page 13).

Consequently, as the Site exists today, it has little, if any, impact on environmental media at and around the Site and there are no complete human or ecological exposure pathways.

II. NYSDEC is inappropriately applying its SCGs to the Site.

The PRAP sets forth NYSDEC's remediation goals for the Site. The PRAP states that "at a minimum, the remedy selected

should eliminate or mitigate all significant threats to public health and the environment presented by the hazardous waste disposal at the Site. (PRAP at page 15). To accomplish this the PRAP identified four Site-specific goals, including

1. Prevent or reduce, to the extent possible, the potential for direct contact exposure (dermal absorption, inhalation and incidental ingestion) with contaminated surface soils and subsurface soils in the Radio Tower Area.

2. Reduce, to the extent practicable, adverse impacts to groundwater from contaminated soils.

3. Prevent or reduce, to the extent practicable, the migration of contaminants through groundwater to surface water.

4. Allow for the productive reuse of the property, remove impediments to access the Lake Erie waterfront, and provide for delisting or reclassifying the site from the Registry of Inactive Hazardous Waste Disposal Sites.

The Site, as it exists today, requires no remedial action at this time to attain these goals. First, as the contaminants at the Site occur at a depth starting at 10 fbgs, there is no potential for direct contact exposure by visitors/ trespassers at the Site.[1]/ Reasonable and frequently utilized land-use controls (including appropriate health and safety requirements for excavations at the Site) effectively address concerns for direct contact exposure with the subsurface soils.

Second, the RI clearly shows that the Site is not having any material impact on groundwater. As referenced above, nitrobenzene, the principal constituent of concern was not even detected in Site groundwater.

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[1] / To the extent there is concern about constituents in surface soil at the Site, the RI clearly shows that surface soil contamination at the Site is comparable to surface soil conditions in the remainder of the 110 acre Outer Harbor area.

Third, the RI established that there is no migration of the contaminants of concern at the Site through the groundwater. If one looks at NYSDEC's own summary of the Site's history, the materials of concern at the Site would have been in place for almost 30 years; still, there is no evidence of any migration of contaminants of concern at wells located immediately downgradient of the Site.

Lastly, there clearly can be productive reuse of the property without implementing the proposed remedy in the PRAP. The presence of these materials at depth in no rational way creates an impediment to access to the waterfront. Rather, reasonable land use considerations for the property, as is consistent with all current State and Federal brownfield and Superfund initiatives, can provide for the productive reuse of this small site while remaining protective of human health and the environment. Remediation should not be required unless future development activities cannot be undertaken without significantly disturbing the contaminants.

III. <u>The Selection of Alternative 5 as a contingent final remedy for the Site may be inappropriate due to potential land-ban considerations.</u>

In its identification of Alternative 5 as a contingent final remedy NYSDEC does not appear to have considered all of the cost implications if bioremediation does not attain the "land ban" criteria. This would mean that off-site disposal and further pre-treatment of the soil <u>after</u> completion of the bioremediation might be required, which could substantially increase the cost of this alternative and make Alternative 2 the most appropriate long term solution.

We believe that the preferred alternative while achieving the threshold criteria, does not meet the balancing criteria identified by NYSDEC. Alternatives 2 and 5/5A both meet the threshold criteria in the context of reasonably anticipated future use assumptions. However, as there is no present human health or environmental exposure pathway, alternative 2 may achieve the balancing criteria at a much lower cost.

IV. <u>A revised alternative 2 should be selected as the final remedy by NYSDEC.</u>

It is clear that the Site, as it exists today, poses no risk to human health or the environment. Enforceable land use

limitations on Site use, together with long-term Site monitoring will ensure that this remains the case. This approach is entirely consistent with Federal Superfund initiatives as well as NYSDEC's brownfield initiatives. Alternative 5/5A should be identified as a contingent remedy only if (a) monitoring results indicate the Site is having a material impact on groundwater or (b) future development activities cannot be implemented without significantly disturbing the contaminants.

While AlliedSignal appreciates NYSDEC's concern that future development scenarios could result in unacceptable risks, under many development scenarios affected materials can safely remain in place, perhaps covered by a parking lot or other component not requiring a deep foundation. There is no justification for requiring expenditure of many millions of dollars for remediation of a site absent an actual risk to human health or the environment.

VI. <u>The unusual history of this Site further supports selection of a revised Alternative 2 remedy.</u>

AlliedSignal was identified as a potentially responsible party at this site solely because it appeared that wastes similar to those found at the Site were generated by its predecessor's operations in Buffalo. Typically, nexus to a site is established through transactional documents such as invoices or bills of lading, or through verbal testimony of haulers or others with knowledge of the Site. At this Site, no such information is available. In light of these facts, further investigations should be undertaken to determine the identity of any transporters or other potential generators of such material. Such investigations could be undertaken prior to the time that future development activities are undertaken and would ensure that all potentially responsible parties are involved in any required remediation at the Site. As there is no immediate need for remediation, it would be appropriate for the Record of Decision to state that in light of the unique factors at this Site (no current need for remediation and insufficient information concerning responsible party nexus), the site should be monitored until such time as development plans are defined and the need to implement Alternative 5A is established.

We trust NYSDEC will consider these comments in making its final remedy decision for the Site. We will contact you in the near future to schedule a meeting to discuss these issues further. If you have any questions, please contact us.

Very truly yours,

PHILLIPS, LYTLE, HITCHCOCK, BLAINE & HUBER LLP

By David P. Flynn/pjs
David P. Flynn

DPF/pjs
395131.1
cc: Pamela J. Cissik, Esq.
David A. Paley

Appendix B

Administrative Record

1. Phase 1 Site Investigation - NFTA (Port Facility); Engineering Science, January 1986

2. Phase 2 Preliminary Site Investigation - NFTA Port Site, No. 9-15-026; Empire Soils, December 1991.

3. Registry Site Classification Decision - NFTA Port Site No. 9-15-026; NYSDEC, March 1992.

4. NYSDEC Administrative Order On Consent, Index #9-0233-88-07; NFTA Respondent, January 1994.

5. Remedial Investigation/Feasibility Study Work Plan Buffalo Outer Harbor Site - Dvirka and Bartilucci Engineers, August 1994.

6. Phase 1/Phase 2 Remedial Investigation Report - Buffalo Outer Harbor Site; Dvirka and Bartilucci Engineers, December 1995.

7. Qualitative Risk Assessment - Buffalo Outer Harbor Site; Dvirka and Bartilucci Engineers, December 1995.

8. Amendment No.1 NYSDEC Administrative Order On Consent, Index #B9-0233-88-07; NFTA Respondent, April 1997.

9. Registry Site Modification Decision - Buffalo Outer Harbor Site No. 9-15-026; NYSDEC, November 1997.

10. Final Report: DARAMEND Bioremediation Laboratory Treatability Investigation of Soil Containing Nitrobenzene - Buffalo Outer Harbor Site; GRACE Bioremediation Technologies, January 1998.

11. Feasibiltiy Study Report - Buffalo Outer Harbor Site; Dvirka and Bartilucci Engineers, July 1998.

12. Proposed Remedial Action Plan - Buffalo Outer Harbor Site (Radio Tower Area); NYSDEC, February 1999.

13. Responsiveness Summary to February 17, 1999 Public Meeeting Buffalo Outer Harbor Site (Radio Tower Area) PRAP; NYSDEC March 1999.