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U.S. EPA
Region II

Superfund Proposed Plan

102nd Street Landfill Site

Niagara Falls, New York

July 1990

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I Announcement of the Proposed Plan

This Proposed Plan identifies the U.S. Environmental Protection Agency's (EPA's) preferred remedy for cleaning up the contaminated soil, sediment, ground water, and storm sewer at the 102nd Street Landfill Site. In addition to the preferred remedy, the Plan includes summaries of other alternatives evaluated for this Site.

This document is issued by EPA, the lead agency for Site activities, and the New York State Department of Environmental Conservation (NYSDEC), the support agency for this Site. EPA, in consultation with NYSDEC, will select a final remedy for the Site only after the public comment period has ended and the information submitted during this time has been reviewed and considered.

EPA is issuing this Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This document summarizes information that can be found in greater detail in the Remedial Investigation and Feasibility Study (RI/FS) report, the Baseline Risk Assessments, and other documents in the administrative record file. EPA and NYSDEC encourage the public to review these and other site-related documents contained in the administrative record file in order to gain a more comprehensive understanding of the Site and the monitoring which has been conducted on the Site. At the end of this document we provide the names of persons to contact for additional information and also the locations containing complete files of the Administrative Record; the public comment period and date of the scheduled public meeting are given also.

II Site Background

The 102nd Street Landfill Site, presently owned by Occidental Chemical Corporation (OCC), and Olin Chemicals (Olin), is a 22.1 acre landfill on the eastern edge of the City of Niagara Falls (the "City") and borders the Niagara River (Figure 1). OCC, formerly Hooker Chemicals and Plastics Corporation, operated its 15.6 acre portion of the Site as an industrial waste landfill from approximately 1943 to 1970. Olin operated its 6.5 acre portion of the Site as an industrial waste landfill from 1948 to 1970. During these periods, OCC and Olin (the "Companies") deposited at least 159,000 tons of waste, in both liquid and solid form, into the landfill. This included approximately 4,600 tons of benzene, chlorobenzene, chlorophenols and hexachlorocyclohexanes (HCCHs).

On December 20, 1979, a complaint, pursuant to the Resource Conservation and Recovery Act (RCRA), the Clean Water Act (CWA), and the Rivers and Harbors Act of 1899 (RHA), was filed against the Companies in the U.S. District Court in Buffalo, New York, seeking injunctive relief and civil penalties for an imminent and substantial endangerment to the public health and welfare. The Site was formally listed as a National Priority List (NPL) site on September 8, 1983. EPA and the Companies prepared a Work Plan for the Site in 1984, and the RI, a study of the nature and extent of contamination, conducted by the Companies, began at this time. The FS Work Plan, as defined in a Stipulation and Decree entered with the U.S. District Court in Buffalo on May 15, 1989, was prepared by EPA and NYSDEC, and agreed to by the Companies. The Work Plan provides the guidance under which the Companies conducted the FS; the FS report describes the development and analyses for all of the remedial alternatives for the Site. Throughout the RI/FS process, EPA, in consultation with NYSDEC, has reviewed all of the interim documentation and

monitored the collection and analysis of samples from the Site.

As shown in Figure 1, the Site is bounded to the south by a shallow embayment of the Niagara River. A stone-faced bulkhead, constructed in the early 1970s to minimize soil erosion to the river, runs along the length of the shoreline at the Site. The embayment lies at the upstream end of the Little Niagara River which flows around the north shore of Cayuga Island before discharging into the Niagara River approximately 1.5 miles downstream from the Site. To the west of the Site is Griffon Park, which was formerly used as a landfill for municipal waste by the City. A number of recreational facilities exist at the park, including a baseball diamond and a boat ramp. Griffon Park is bordered on the west by the Little Niagara River. Across the Little Niagara River is Cayuga Island, which is inhabited. The property to the east of the Site (the "Belden Site") is zoned "residential" with one current residence, but is otherwise an unimproved densely brushed field. A drainage ditch runs through the Belden Site, parallel to the eastern edge of the 102nd Street Site and into the Niagara River. The area east of the Site has reportedly received industrial waste in the past, but the quantity and nature of this waste is not known.

The RI/FS study area north of Buffalo Avenue and south of the LaSalle Expressway, is zoned "commercial," with three properties currently used for commercial purposes: a restaurant, an automotive repair shop, and a welding shop. In addition, one residence exists in this portion of the study area. The Love Canal Site is immediately north of the LaSalle Expressway opposite the 102nd Street Site.

The 100th Street storm sewer crosses the Site and discharges to the Niagara River. Ground water was observed and measured infiltrating the storm sewer both during the RI and in earlier investigations. The storm sewer carries runoff from the Love Canal area and drains Buffalo Avenue in the immediate vicinity of the Site.

III Scope of Response Action

During the RI/FS, the Companies collected samples of ground water, on-site and off-site soils, offshore sediments, and (recently) storm sewer discharge, analyzing them for chemical contamination. Hydrogeologic and special sampling for the presence of non-aqueous phase liquid (NAPL) contamination was also performed.

The RI/FS reports present detailed data on contaminant levels for a total of 69 chemicals of concern for the Site. Site contaminants generally fall into several broad groups: trace metals (such as mercury), chlorinated single ring aromatics (such as tetrachlorobenzene), chlorinated phenols (such as trichlorophenols), hexachlorocyclohexanes (including lindane), polychlorinated biphenyls (PCBs), polychlorinated dioxins (especially 2,3,7,8-TCDD), and dibenzofurans. Ground-water flow beneath the Site is generally towards the Niagara River. The RI/FS sampling confirmed the presence of NAPL on the Site. No site-related contamination in the bedrock aquifer was observed, despite large contaminant concentrations in the overburden water table.

Some soils just outside the perimeter of the Site contain elevated levels of dioxin and mercury. In addition to contaminated areas around the Site perimeter, some soils north of Buffalo Avenue and south of the LaSalle Expressway (off-site soils) were found to contain Site Specific Indicator (SSI) contaminants at levels above Survey Levels. The Survey Levels define the extent of detectable site-related contamination; they are also used as cleanup thresholds for remedial action.

Operable Units

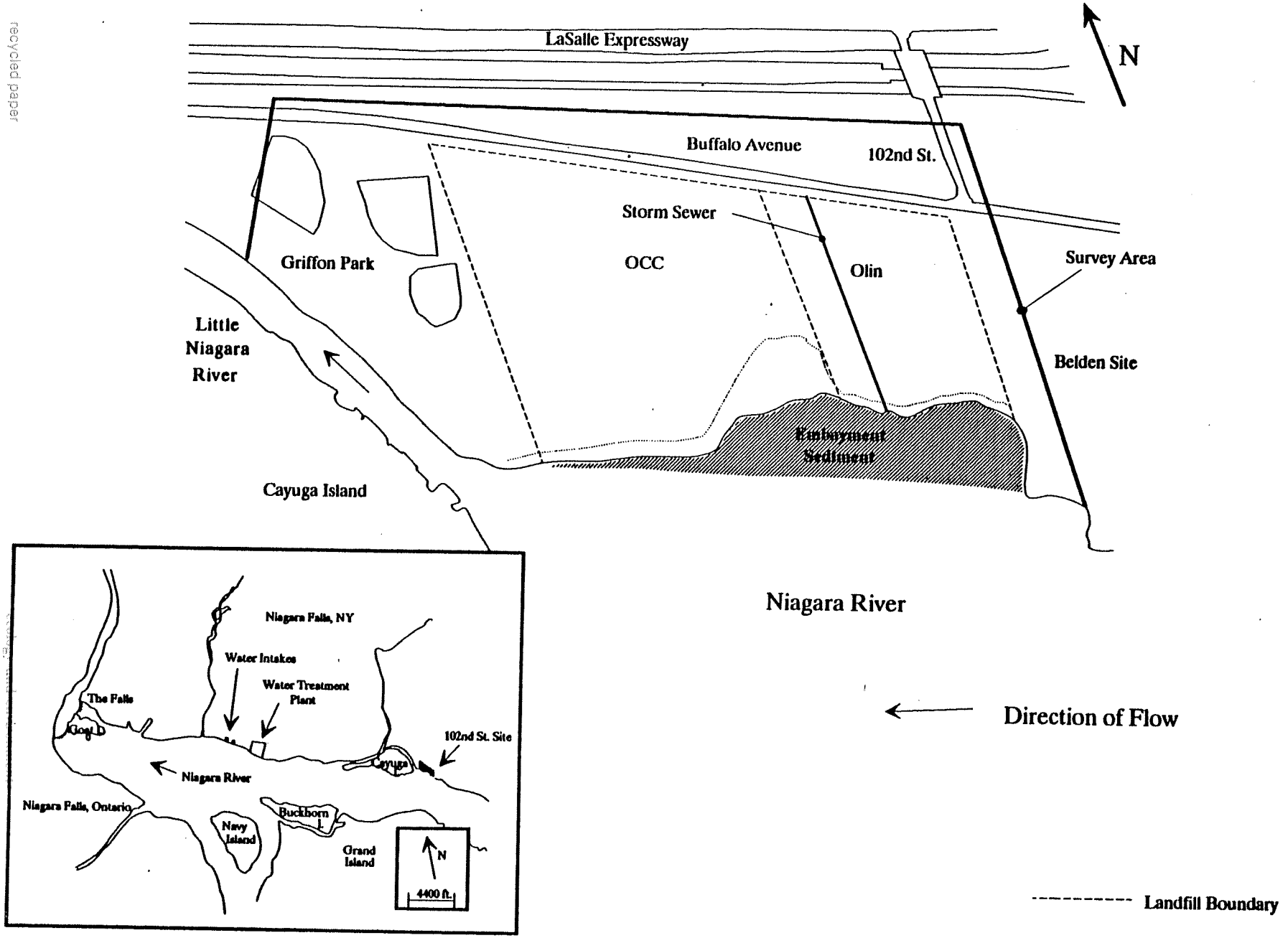
The FS for the Site focuses on reviewing and evaluating alternative methods for remediating all of the contaminated areas at the Site. These areas have been separated into 3 discrete components, or "Operable Units" (OUs). To facilitate the analysis, the remedial alternatives for each of the OUs were evaluated separately in the FS. The three OUs are:

- **OU-1:** Landfill residuals including on-site fill, off-site soil, shallow ground water, and non-aqueous phase liquids (NAPL).
- **OU-2:** River sediments within the shallow embayment of the Niagara River adjacent to the Site.
- **OU-3:** The storm sewer.

Landfill residuals currently pose indirect threats to human health and the environment since contaminants are migrating from the landfill off-site in ground water. Contaminated embayment sediments pose environmental risks to fish and wildlife and also serve as a source of surface-water contamination. The storm sewer provides a conduit for contaminant migration from the Site, although it is currently a less significant migration pathway than direct discharge of ground water into the embayment.

The principal threats posed by contamination in each of these operable units for the Site are addressed by

Figure 1 102nd Street Landfill and Survey Area



the proposed remedy. Numerous potential alternatives for remediating the threats posed by each of these OUs were evaluated in the Feasibility Study. Each of the final-candidate remedial alternatives is described briefly in Section V below; more detailed descriptions are contained in the FS report available in the administrative record file. The proposed remedy selected for the Site consists of a preferred alternative for each OU, and the preferred alternative for each OU is summarized at the end of this document.

IV Summary of Site Risks

EPA and the Companies conducted separate evaluations of the possible threats to human health and the environment that could result if the Site were to remain in its current state with no cleanup. This analysis is referred to as a "baseline" risk assessment (the "Risk Assessment").

EPA's Risk Assessment evaluated potential endangerment due to exposure to contaminated soil, from chemicals migrating in ground water or the storm sewer and discharging into the Niagara River (including the Little Niagara River), and from embayment sediment contamination. The results indicate that significant human-health risks would be associated with long-term exposure to off-site contaminated soil and exposure to Site contaminants in surface water of the embayment and the Little Niagara River. Based on "Reasonable Maximum" human exposure estimates, the total increased risk of cancer from the Site was calculated to be 2×10^{-3}, with virtually the entire risk attributable to eating contaminated fish caught in the embayment. Exposure to off-site soils poses a potential increased lifetime cancer risk of 8×10^{-5}. The contaminants primarily responsible for the cancer risks are dioxin (2,3,7,8-TCDD), hexachlorocyclohexanes, and, in some cases, PCBs. Possible adverse health effects due to chronic exposure to noncarcinogenic Site compounds are significant for tetrachlorobenzenes.

EPA's risk assessment also examined endangerment to the environment. Mirex contamination from ground water that discharges to the embayment, and chlorotoluenes, chlorobenzenes, hexachlorocyclohexanes, and trichlorophenols in embayment sediments pose likely or possible concern to aquatic or benthic (sediment dwelling) organisms. In addition, fish-eating wildlife, consuming contaminated fish, are likely to be adversely affected by Site contamination in the embayment.

Based on EPA's risk assessment, the most significant human health risk and environmental endangerment is posed by Site contaminants currently in, or migrating into the embayment. These Site risks will be reduced to health-protective levels by the preferred alternative which removes contaminated sediments from the embayment, and prevents future discharge of contaminated ground water. In addition, perimeter and off-site (north of Buffalo Avenue) surface soils above the cleanup thresholds will be remediated to health-protective levels.

V Summary of Alternatives

OU-1 (Landfill, Off-site Soils, Ground Water, and NAPL)

The FS describes various remedies for the Site, including, as required by the National Contingency Plan (NCP), the option of taking "no-action" and leaving the Site as it is with a fence and existing soil cover. Following a general screening of the many possible alternatives, a total of 13 alternatives were evaluated in detail in addition to the no-action alternative (Table 1).

The final-candidate remedies for OU-1 can be grouped into several broad categories (the numbered categories below correspond to the numbered alternatives in the FS and also in all future discussions here). Each of these categories consists of several alternatives for the remediation of ground water and/or off-site soils. A listing of these categories can be found in the box on the following page.

The most comprehensive alternatives of each of the three "action alternative" categories involving Site cleanup are outlined below. The FS report contains complete summaries of all 13 alternatives for this Operable Unit. Estimated costs and implementation times summarized here are from the FS. Since the implementation periods for each operable unit may overlap, the overall time to complete remedies for all OUs may be somewhat less than the implementation times of each OU added together. It should also be noted that the stated implementation periods include a component for the design of the intended remedial action. In specific terms, for OU-1, Alternatives 2A through 2E allow 18 months for design, while Alternatives 3A through 3F allow 24 months, and Alternatives 5A,5B, and 5C, anticipate 36 months. The implementation periods for OU-2 and OU-3 include 12 months for remedial design.

OU-1 Alternative 2E: Existing Landfill Cover; Stabilize Perimeter and Off-site Soils; Cutoff Wall for Ground-Water and NAPL Control and Ground-Water Recovery

Implementation Period: 24 months
Present Worth Costs: $10,700,000 (Capital - $5.83M, O&M - $4.82M)
This alternative would involve excavation of all perimeter and off-site soils (5,800 yd^3) above cleanup thresholds. These soils would then be treated so as to form cement-like materials and deposited on-site. A low permeability "cutoff" wall would be installed in the soil along the river boundary so as to control water intrusion from the river and to retard ground-water and NAPL migration. Actual placement of the cutoff wall (in certain options, a circumferential slurry wall) will be determined through the installation of geotechnical borings along the proposed route of the wall. These borings will extend to the clay/till layer and will be used to define the extent of NAPL. The cutoff wall will be constructed outside the extent of the NAPL. Ground-water recovery wells would remove an estimated 25 gpm for treatment to remove organic and inorganic contamination. This treated water would then be discharged either to a City sewer or to the Niagara River in accordance with required permits.

Optional, less comprehensive, variations of this alternative include:

2A) Excavation of only perimeter soils "hot spots" for mercury and dioxin with permanent placement in a secure (lined and capped) cell on-site; no other remedial components (19 months, $1.8 million).

2B) Same as 2A for perimeter soils plus a slurry cutoff wall along the riverbank with ground-water recovery and treatment (23 months, $9.62 million).

2C) Same as 2B, except perimeter soils would be incinerated rather than buried on-site (23 months, $9.51 million).

2D) Excavate all perimeter and off-site soils above cleanup thresholds with burial on-site in a secure cell (without stabilization) and cutoff wall/ground water recovery identical to 2E (24 months, $9.86 million).

OU-1 Alternative 3F: Cap Landfill and Perimeter Soils; Excavate Off-Site Soils and Bury Beneath Cap; Circumferential Wall; Ground-Water Recovery and Treatment; NAPL Recovery and Incineration

Implementation Period: 36 months
Present Worth Costs: $20,300,000 (Capital - $13.2M, O&M - $7.14M)

This alternative involves moving perimeter and off-site soils above cleanup thresholds to the Site, capping the entire Site (about 24 acres) using a combined compacted soil layer with a synthetic liner, and ground-water and NAPL controls. A 4,800 ft slurry wall completely encircling the site would be installed throughout the varying depth of 10 to 35 feet to the clay/till confining layer so as to minimize ground-water flow through the landfill soils. Ground water would be collected (for treatment) via interceptor drainage trenches installed below the seasonal low water table, creating inward gradients across the wall. In order to create such inward gradient, it is estimated that an approximate amount of 1,000,000 gallons will be extracted initially over a short time period (e.g., 3 months). Thereafter, ground-water recovery on a steady-state basis would total an estimated 2,500 gallons per day, a relatively small amount because the cap and circumferential slurry wall reduce infiltration and ground-water inflow at the Site. In addition, NAPL extraction wells would be placed in areas of NAPL contamination. NAPL would be incinerated and ground water would be treated in one of three off-site treatment facilities prior to discharge to a City sewer or to the river in accordance with applicable permits.

Alternative	Remedy
(1)	**No-Action** (leaves existing fence and soil cover on landfill).
(2)	**Upgrade existing fence and leave existing soil cover**; includes options that remove/remediate off-site soils and stabilize or deposit these soils in a "secure cell" on-site; recover and treat ground water with installation of a ground-water cutoff wall.
(3)	**Cap the Site**; includes options that incorporate soil from off-site areas, and recover and treat ground water with installation of a ground-water cutoff wall.
(5)	**Excavate and incinerate landfill wastes and off-site soil**; recover and treat ground water with installation of a ground-water cutoff wall.

Optional less comprehensive variations on Alternative 3 include:

3A) Excavation of perimeter soils above cleanup thresholds and burial beneath a newly constructed Site cap; no other remedial activities (30 months, $9.55 million).

3B) Same as 3A plus a cutoff wall along the river boundary with ground-water/NAPL recovery wells (34 months, $17.6 million).

3C) Same as 3B except the cutoff wall would completely encircle the Site and ground-water extraction would be via shallow drainage trenches; no remediation of off-site soil (36 months, $16.6 million).

3D) Same as 3C plus removal of all off-site soils above cleanup thresholds and burial on-site (36 months, $16.7 million).

3E) Same as 3B (i.e., cutoff rather than circumferential wall) with removal and on-site burial of off-site soils above cleanup thresholds (34 months, $21.3 million).

OU-1 Alternative 5C: Excavate NAPL areas, Off-site and Perimeter Soils with On-Site Incineration and Capping of Landfill; Ground-Water Recovery and Treatment

Implementation Period: 156 - 180 months (13 - 15 years)
Present Worth Cost: $295,000,000 - $376,000,000 (Capital - $287 - $368M, O&M - $8M)

This alternative would involve excavation of approximately 7.9 acres of NAPL-contaminated soils to the interface of the alluvium with the clay/till layer, a depth of as much as 35 feet in some areas. Prior to excavation, a circumferential slurry wall would be constructed. The enclosed area will approximate 25 acres. The excavation would yield an estimated 406,000 yd^3 of material, which is to be incinerated on-site. Negligible volume reduction is likely to occur upon incineration, since the volume of the organic compounds, which are destroyed by incineration, is small compared to the volume of the solid material. Thus, approximately 406,000 yd^3 of ash would remain after incineration, which would be buried on-site if appropriate permits are received, or disposed in an off-site landfill otherwise. After excavation, a cap would be installed over the entire Site. Ground water would be recovered using an interceptor drain, and treated. Ground-water treatment and discharge would be performed as described for the other remedial alternatives, listed above.

Two variations of this alternative were also considered:
5B) This Alternative requires less extensive excavation and incineration than Alternatives 5C. Excavation would be limited to NAPL-contaminated soil above the water table, a depth of approximately 10 feet, yielding an estimated 127,500 yd^3 of excavated material to be incinerated on-site. As before, negligible volume reduction is likely to occur upon incineration, so approximately 127,500 yd^3 of ash would remain after incineration, which would be buried on-site (if approved), or disposed in an off-site landfill. Because NAPL in the soil below the water table would not be excavated, attempts would also be made to collect this NAPL after excavation by selectively installing NAPL extraction wells. Any NAPL so recovered would be incinerated on-site. All other aspects of this alternative are as in 5C (156 months, $80.4 to $148 million).

5A) This Alternative is identical to 5B except that selective NAPL extraction/incineration would not be attempted (108 months, $77.1 to $144 million).

OU - 2: River Sediments

The final-candidate remedial alternatives for OU-2 are summarized in Table 2, and described briefly below.

OU-2 Alternative 2A: Dredge/Dewater Sediment Areas with Elevated Concentrations, Spread On-site and Cap

Implementation Period: 15 months
Present Worth Costs: $1,800,000 - $2,730,000 (Capital - $1.39 - $2.31M, O&M - $0.42M)

Two areas just offshore from the Site, one near the sewer outfall and the other near the Griffon Park boundary, would be dredged. These are the most contaminated sediment areas in the embayment. Prior to dredging, a berm would be constructed outside of the contaminated area to prevent the downstream transport of sediment. The estimated 4,600 yd^3 of sediment would be dewatered using a filter press and spread upon the surface of the site prior to its capping as part of OU-1.

One variation of this alternative was considered in depth. Alternative 2C would involve incineration rather than landfilling of the dredged sediments from the two areas which contain elevated concentrations of contaminants ("hot spots") (16+ months, $3.66 to $4.48 million).

OU-2 Alternative 4: Dredge All Site-Contaminated Sediments; Dewater; Extend Cap Over Dewatered Sediments

Implementation Period: 20 months
Present Worth Costs: $4,070,000 - $6,174,000 (No O&M costs)

All sediments between the shore and the point farthest offshore exceeding cleanup thresholds (this point or line is known as the "clean line") would be dredged to a depth estimated at 2 ft. These sediments, estimated to be 15,000 yd^3, would then be filled (behind a newly constructed berm) into the marshy lowland area between the Site and the river which would provide a settling/dewatering basin. The entire area to be dredged would be separated from the river by the construction of a second berm (beyond the clean line) which would prevent downstream transport of dredged sediment. After a sediment settling period, excess water from the settling basin would be removed for treatment (4.5 million gallons) and then an additional 8,500 yd^3 of fill would be added to the settling basin and the area which would be capped (1.8 acres) in conjunction with OU-1. This alternative anticipates more cap coverage than Alternative 6A, hence the increased cost figures and implementation times.

OU-2 Alternative 6A: Dredge All Site-Contaminated Sediments, Dewater and Bury Sediments On-site Beneath Cap

Implementation Period: 18 months
Present Worth Costs: $3,600,000 - $5,570,000 (No O&M costs)

This alternative would involve dredging the same sediment area as in Alternative 4, with the exception that once dewatered (as accomplished in Alternative 4), the sediments and temporary berm would be re-excavated and buried on-site beneath the cap (Alternative 4 extends landfill cap over the settling basin). The temporary berm would be constructed parallel to the shore and dredged sediments would be stored between this berm and the existing shoreline bulkhead for dewatering. Following dewatering, all contaminated sediments and the berm, totalling approximately 28,000 yd^3, would be buried on-site beneath the cap installed as part of OU-1.

One variation of this alternative which was considered, Alternative OU-2-6C, would involve incineration of the dredged sediments. The berm material would not be incinerated (27+ months, $11.8 to $13.2 million).

OU - 3: Storm Sewer

The final-candidate remedial alternatives for the storm sewer are summarized in Table 3 and described briefly below.

OU-3 Alternative 2A: Install HDPE Slipliner in Sewer

Implementation Period: 15 months
Present Worth Costs: $605,000 (Capital - $535,000, O&M - $69,600)

The existing sewer pipe would be cleaned and left in place but lined with a chemically resistant sleeve made of high density polyethylene (HDPE) plastic. The annular space between the original pipe and the sleeve would be pressure-grouted. This would prevent ground water and NAPL from infiltrating the conduit or the annulus, thereby eliminating enhanced transport of contaminants to the river via this pathway.

One variation of this alternative was considered in detail. Alternative OU-3, 2B would use "insituform," an inversion lining method which employs a thermosetting polyester resin to line the sewer pipe (14 months, $718,000).

OU-3 Alternative 3B: Bypass Site with a Lift Well and Force Main

Implementation Period: 19 - 20 months
Present Worth Costs: $2,990,000 - $4,950,000 (Capital - $1.83M, O&M - $1.16M; C - $3.98M, O&M $0.97M)

The existing sewer on-site would be abandoned and a 36-inch diameter pressurized pipe and pumping station installed. The new sewer would bypass the Site and be capable of handling 20 MGD (million gallons per day) flow. The abandoned sewer would either be plugged (Option A) or removed (Option B).

VI Evaluation of Alternatives

EPA's risk assessment indicated that unacceptable risks are associated with many of the contaminated areas or sources attributable to the Site including ground water in the landfill soils, sediments in the embayment, and off-site/perimeter soils. As a result, the most desirable alternative for each Operable Unit must adequately reduce the risks from each of these problems. The preferred remedy for Site cleanup

includes the following alternatives and remedial actions:

OU-1 **Alternative 3F:** Cap Landfill and Perimeter Soils; Excavate Off-Site Soils and Bury Beneath Cap; Circumferential Wall; Ground-Water Recovery and Treatment; NAPL Recovery and Incineration

OU-2 **Alternative 6A as modified by Alternative 2C:** Dredge Sediments From Two Areas Which Contain Elevated Concentrations Of Contaminants, And Incinerate These Sediments Off-Site (2C). Dredge All Remaining Site-Contaminated Sediments, Dewater and Bury Sediments On-site Beneath Cap (6A).

OU-3 **Alternative 2A:** Install Plastic (HDPE) Slipliner in Sewer

Based on current information, this remedy would appear to provide the best balance of trade-offs among the alternatives with respect to the nine criteria that EPA uses to evaluate remedial alternatives. This section profiles the performance of the preferred alternatives against the other final-candidate alternatives under consideration. A glossary of the evaluation criteria is provided in the box on the following page.

ANALYSIS OF ALTERNATIVES

Overall Protection

With the exception of the no-action alternatives, all alternatives would provide some protection of human health and the environment. Because risks from off-site soil exposure and consumption of fish from the Niagara River pose the largest risks, the alternatives which deal with these exposure pathways most effectively, will be the most desirable.

Protection for Soil Exposure Pathways (OU-1)

Alternatives 2A,B,C for OU-1 do not remediate the off-site contaminated soils north of Buffalo Avenue, hence these options do not adequately protect human health or the environment from the effects of Site contaminants. The other two alternatives considered for Alternative 2 (2D and 2E), would provide adequate health and environmental protection by either isolating the contaminants in a secure cell (2D) or stabilizing them (2E). However, none of the Alternative 2 options provides adequate protection from contaminants on the Site, since remediation of the on-site area is limited to an improved fence surrounding the Site.

As in the above case, Alternatives 3A,B,C for OU-1 do not remediate contaminated off-site soils and, hence, do not provide adequate human and environmental protection. The remaining variations of Alternative 3 (3D,E,F) would address off-site and perimeter soils by excavating them and reburying them beneath a cap over the Site, a sufficient technology to provide overall protection given the contaminant levels and exposure pathways. Since the entire Site receives a cap (with a synthetic liner), this alternative provides greater overall protection than Alternative 2, by removing all soils above cleanup thresholds outside the Site boundaries, with on-site burial accompanied by a new cap over the landfill.

Soil incineration (Alternative 5 for OU-1) provides protection of greater permanence because contaminants are excavated from the Site and destroyed by incineration. However, with adequate implementation and monitoring of the preferred remedy (3F), the contaminants will be effectively isolated from future human and environmental exposure such that the increased permanence provided by Alternative 5 may only result in a slight increase in protectiveness. Furthermore, as discussed later, the increased long-term protection provided by Alternative 5 is accompanied by short-term risks associated with excavation/incineration, the technical difficulties involved, and much higher costs than those of Alternative 3F.

Protection for Niagara River Exposure Pathways

Protection of the Niagara River and associated exposure pathways requires action to control contaminant exposure/migration from all three Operable Units.

OU-1. Migration of contaminants in ground water from the landfill (OU-1) is the primary concern for Niagara River exposure scenarios for this OU. Health risks will be directly influenced by reducing the potential for bioaccumulation in fish caused by discharge of contaminated ground water from the Site into the Niagara River embayment. Alternative 3 combines a cap over the landfill (which reduces infiltration and subsequent ground-water discharge) with more extensive ground-water recovery and treatment options, than Alternative 2. In addition, various options under Alternative 3 (3B,C,D,E,F) provide varying degrees of NAPL control/remediation.

Therefore, Alternative 3 provides greater health protection than Alternative 2. Alternative 5 controls ground-water migration using the same remedial

GLOSSARY OF EVALUATION CRITERIA

Overall protection of human health and the environment addresses whether or not a remedy provides adequate protection and describes how risks associated with each exposure pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

Compliance with applicable or relevant and appropriate requirements (ARARs) addresses whether or not a remedy will meet all the State or Federal ARARs, or provide grounds for invoking a waiver.

Long-term effectiveness and permanence defines the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met.

Reduction of toxicity, mobility, or volume is the degree to which permanent treatment technologies are employed and the anticipated performance of those treatment technologies.

Short-term effectiveness addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup goals are achieved.

Implementability involves the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement the chosen solution.

Cost includes the estimated capital, operation and maintenance costs, expressed in terms of net present-worth costs.

State acceptance includes whether, based on its review of the RI/FS and this Proposed Plan, the State concurs with, opposes, or has no comment on the selected remedy at the present time.

Community acceptance will be assessed in the Record of Decision (ROD) and refers to the public's general response to the alternatives described in this Proposed Plan and the RI/FS reports.

actions as Alternative 2, but offers increased protection by also removing and incinerating the "NAPL areas," thus greatly reducing the source of contaminants migrating in ground water.

OU-2. Dredging of contaminated sediments (OU-2-6A) will be required to reduce risks to aquatic biota as well as to reduce contaminant bioaccumulation in edible fish. Dredging and incinerating "hot spots" (OU-2-2C) will provide permanent protection from these highly contaminated sediments. Since health-based or risk-based sediment remediation criteria have not been established, these combined alternatives (6A and 2C) which have the net effect of excavating all sediments to the "clean line", and incinerating those sediments from the areas of elevated concentrations, and burying the remaining sediments beneath the cap, were selected as the most reasonable action-alternatives designed to ensure the maximum overall human and environmental protection.

OU-3. Remediation of the storm sewer (OU-3) will eliminate the contaminant loadings to the river attributable to the sewer. With adequate installation, monitoring and maintenance, Alternative 2 (the preferred alternative) should provide adequate protection of human health and the environment. Alternative 3, which replaces the existing sewer and reroutes another line around the Site, would provide even greater protection. Because the chemical loads in the sewer are less significant than other sources of Site contamination, the somewhat greater protection afforded by Alternative 3, appears to be outweighed by the greater technical difficulties and increased costs associated with this alternative.

Compliance With ARARs

OU-1. Ground water located in the landfill soils at the Site is classified by EPA as Class IIB and by NYSDEC as Class GA (potential source of drinking water), although it is not a source of drinking water. The Safe Drinking Water Act Maximum Contaminant Levels (MCLs) and Maximum Contaminant Level Goals (MCLGs), and NYSDEC Quality Standards for

Groundwaters are chemical-specific ARARs for the ground water on-site. Although RCRA Groundwater Concentration Limits (RCRA limits), which are also ARARs for ground water, exist for 4 of the chemicals of concern, Lindane (4 ppb), mercury (2 ppb), arsenic (50 ppb), and cadmium (10 ppb), these limitations are identical to the previously mentioned MCLs.

Alternatives 2A and 3A, which do not remediate ground water, will not comply with ARARs. Furthermore, alternatives which do not accomplish any NAPL removal (2A,B,C,D,E and 3A,B,C,D), thus leaving NAPL as a significant source for ground-water contamination, are unlikely to achieve ARARs. Only Alternative 5C will remove all NAPL at the Site and hence could achieve ground-water ARARs within a reasonable time frame. Alternatives 3F, 5A, and 5B, which provide for some NAPL removal, may achieve ground-water ARARs (in the very long-term) since they also include long-term recovery, treatment, and monitoring of ground water. However, because much of the NAPL occurs in the soil beneath the fill, Alternatives 5A and 5B, which require only excavation and incineration of the fill material, would not necessarily provide significantly accelerated compliance with ARARs, but provide more permanent solutions than does 3F.

Ground water in the landfill soils discharges into the Niagara River and across the west and east boundaries of the Site. As stated in the NCP, when wastes are left in place, the "point of compliance" lies at that point beyond the areal limit of the contained wastes where ground water discharges. In the case of the 102nd Street Site, the point of compliance for ground water is the embayment of the Niagara River (just outside the slurry wall), ground water outside the slurry wall in Griffon Park (west), and ground water outside the slurry wall to the east of the Site within the area bounded by the drainage ditch. Relevant ARARs for ground water discharging to the embayment are the Clean Water Act ambient water quality criteria (AWQC) and the New York State ambient water quality standards (AWQS). Chemical-specific ARARs for ground water discharging west and east of the Site include MCLs and MCLGs. Any remedial alternative selected must be one which reduces the quantity of ground-water discharge, and/or improves its quality to reduce surface-water contaminant concentrations in the embayment, and to reduce ground-water contaminant concentrations to the west and east of the Site; all of which would be done to meet ARARs.

The EPA Risk Assessment, using embayment water concentrations derived from ground-water chemical discharge and embayment dilution, determined that several compounds currently exceed the AWQC or AWQS. Surface water ARARs will be achieved by those OU-1 alternatives which limit future discharge of contaminated ground water into the River. Alternatives 2A and 3A, which do not restrict ground-water discharge to the River, will not comply with ARARs. The action alternatives employing a cutoff wall (2B,2C,2D,2E;3B;5A,5B,5C) and those employing a circumferential slurry wall (3C,3D,3E,3F) should effectively limit ground-water discharge to the embayment and meet ARARs. A circumferential slurry wall provides the most complete ground-water control and greatest assurance of meeting ARARs.

No ARARs are established for contaminated soils, although the Center for Disease Control has established a guidance value of 1 $\mu g/kg$ (ppb) for dioxin in residential soils. Since the Risk Assessment indicates significant health risks are associated with soil exposure, all perimeter and off-site soils above cleanup thresholds will be remediated (including dioxin contaminated soils south of Buffalo Avenue).

Land Disposal Restrictions (LDRs) preclude the placement of restricted RCRA hazardous wastes into a land disposal unit. The off-site and perimeter soils and the embayment sediments are a restricted RCRA hazardous waste, in part because they contain dioxin. If consolidating these soils and sediments on the landfill constitutes placement into a land disposal unit, then such remedial actions would fail to satisfy the LDRs. According to EPA's Superfund LDR Guide #5 (OSWER Directive 9347.3-05FS, July 1989), "Placement does not occur when wastes are ... moved within a single AOC [area of contamination]." An AOC is "the areal extent of contiguous contamination," such as a "landfill ... and the surrounding contaminated soil." "Such contamination must be continuous, but may contain varying types and concentrations of hazardous substances." The perimeter and off-site soils and embayment sediments do accordingly constitute contiguous and continuous contamination, and so consolidating these soils on the landfill would not be "placement." Therefore, LDRs are not applicable. As a further comment, it should be noted that the contamination north of Buffalo Avenue is considered contiguous with the contamination surrounding the Site boundaries (even though these areas are separated by the road) because continuous contamination was found between the Site fence and the south side of Buffalo Avenue, as well as on the northern edge of Buffalo Avenue. Because no samples of the road itself were taken, it cannot be assumed a priori that the road is clean. Thus, the contamination north of Buffalo Avenue is continuous and contiguous.

OU-2. No promulgated federal or State ARARs exist for contaminated sediment, however New York State does have guidelines "To Be Considered" (TBCs) for sediment which require aqueous contaminant levels in

the water surrounding the sediment ("interstitial" water) to meet ambient water quality criteria (AWQC) and State ambient water quality standards (AWQS). Alternative OU-2-2C, which incinerates the sediment "hot spots," will of course achieve these TBCs, as well as providing permanent protection from these areas of elevated contaminant concentrations. Alternatives 4 and 6 would achieve the compliance with the sediment TBCs since all site-related sediment contamination would be dredged from the embayment.

Dredging activities for all alternatives would be conducted in compliance with ARARs for excavation in a 100-year floodplain, wetlands, and construction of bulkheads in navigable waters.

OU-3. Ground-water infiltration into the sewer and subsequent discharge to the embayment must meet surface water AWQC. All action alternatives should effectively eliminate future discharge of Site contaminants and thereby meet these criteria.

Long-Term Effectiveness and Permanence

OU-1. Alternative 5C and to a lesser extent Alternatives 5A and 5B, which entail the most removal/destruction of site contaminants, provide the greatest long-term effectiveness. The alternatives aimed at NAPL and ground-water recovery/treatment (3E and 3F) or ground-water recovery/treatment (2B,C,D,E; 3B,C,D,E,F) also offer degrees of permanent destruction of the most mobile contaminants over the long term. However, these remedies are not "permanent" because long-term monitoring of treatment processes and effective maintenance of the remedy must be achieved to ensure long-term effectiveness for these Alternative 2 and 3 remedial options. All of these alternatives will have similar, positive long-term impact on the Niagara River, depending on the amount of NAPL, if any, which exists beneath the river.

OU-2. Remediation Alternative 6C, which removes all site-related contaminated river sediments to the "clean line" and destroys contaminants by incineration, provides the most permanent overall remedial option. Alternative 2C which removes and incinerates the sediments from the two "hot spots", will likewise provide the highest degree of permanence for these specific areas. Alternatives 4 and 6A also dredge sediments to the "clean line," but do not incinerate the sediment; rather these two alternatives call for depositing sediments on the Site (the difference between them is in the specifics of where the sediments are backfilled). Because of the low mobility of the primary contaminants of concern in the sediments, with continued monitoring, their excavation and reburial on-site should provide adequate long-term effectiveness. Alternative 2A would provide less long-term effectiveness and permanence because it addresses only two sediment "hot spots" in terms of dredging those sediments and placing them beneath the cap. As long as the site containment remedial components are maintained effectively, the long-term effectiveness of Alternatives 4 and 6A may be indistinguishable from 6C.

OU-3. Alternative 3B would be the most permanent solution because it would replace the existing sewer with a new one which bypasses the Site. Plugging the existing sewer and adding a bypass (Alternative 3A) or lining the existing sewer to prevent infiltration (Alternative 2) would be less permanent than Alternative 3A, but would provide essentially the same long-term effectiveness with continued maintenance and periodic replacement of the plug or sewer lining. Without proper inspection/maintenance, plugging or lining the sewer offers less long-term effectiveness than does excavating and rerouting it around the Site.

Reduction of Toxicity, Mobility or Volume of Contaminants

With the exception of the no-action alternatives, all of the alternatives reduce the toxicity, mobility and/or volume of Site contaminants. Many of the final alternatives considered for the Site focus on reducing contaminant mobility (which effectively isolates contaminants from future human/environmental exposure risks) as the primary remediation method; to varying degrees, the remedies reduce contaminant toxicity or volume for targeted areas or media.

OU-1. Alternative 2, which upgrades the fence around the Site and provides some remediation of off-site soil and ground water beneath the Site, has the least impact on toxicity, mobility or volume of Site contamination. Placement of off-site soils in a secure cell (2D) or stabilization (2E) reduces contaminant mobility, but does not reduce their toxicity or volume (stabilization methods actually increase the volume of disposed solids). Ground-water recovery and treatment (2B-2E) will reduce the toxicity and volume of contaminants over very long time periods. Alternative 3 reduces contaminant mobility and volume to a greater extent than Alternative 2 since the cap reduces infiltration (thereby reducing ground-water recharge, while also reducing chemical mobility and volume). Alternative 3 also reduces the toxicity and volume of ground-water contaminants through recovery and treatment. The most comprehensive options of this alternative (3E, 3F), which call for selective NAPL removal and incineration, reduce contaminant volume and toxicity to the greatest extent of alternative 3 options. Finally, Alternative 5, which calls for excavation and incineration of the NAPL areas (5A-

5C), provides the greatest contaminant removal/destruction. However, a large volume of ash must be disposed of for this alternative.

OU-2. With the exception of Alternative 6C, which involves removal and incineration of all contaminated sediments to the "clean line", and Alternative 2C, which incinerates the sediments from the "hot spots" only, all other action alternatives for OU-2 reduce the mobility of contaminants by removing them from the River. Alternatives 6C and 2C provide essentially complete destruction of organic contaminants, but, as above, these options can require disposing of a substantial volume of ash. Alternative 2A, which only remediates the two "hot spots" in terms of removal and placement of sediment beneath the cap, reduces contaminant mobility less than Alternatives 4 and 6A, which dredge all site-related contaminated sediments out to the "clean line."

OU-3. All action alternatives of OU-3 will reduce contaminant mobility by preventing transport via the storm sewer; none of them reduce contaminant toxicity or volume. With careful installation, maintenance, and monitoring, Alternative 2, which involves lining the sewer, should provide results comparable to Alternative 3, which completely reroutes the sewer.

Short-Term Effectiveness

Alternatives involving incineration (Alternatives OU-1-5, OU-2-2C, and OU-2-6C) would be the least effective over the short term due to delays anticipated with getting a permitted incinerator available and due to the potential health risks associated with the excavation and incineration process. It is estimated that an incinerator trial burn would require 2 years during which remedial activities at the Site would be inhibited. Excavation and incineration activities can pose health risks to the nearby residents due to exposure to fugitive dust generated during excavation, and potential emissions from the incinerator. However, both fugitive dust and incinerator emissions can be controlled such that the short-term health risks are minimized or eliminated. As discussed below with respect to the "implementability" criterion, excavation may have its effectiveness limited and worker safety threatened due to the presence of phosphorus waste at the Site.

Dredging activities associated with the OU-2 alternatives could have short-term negative impacts on the Niagara River. The construction of berms (to contain dredged sediment) in all action alternatives would temporarily increase sediment loads to the River, and some of this sediment transported in the River may be contaminated. However, since the berms in question will clearly be located outside the area of contamination, it is highly unlikely that any contaminated sediments will be released into the River. As discussed below with respect to the "implementability" criterion, Alternative OU-1-5C could result in serious environmental damage or threats to worker safety from potential slurry wall failure.

Alternatives involving excavation of off-site/perimeter soils, the storm sewer, or trenches for the installation of slurry walls or drains, will all involve some short-term health risks to workers and/or nearby residents due to fugitive dust and vapor emissions. Workers would be required to wear protective clothing in order to minimize potential health risks. All activities requiring excavation of soils along Buffalo Avenue would create short-term concerns of disrupting local utilities. Excavation would be performed in such a way and under such conditions as to minimize risks to nearby residents.

Many of the remediation activities are likely to involve excavating areas containing NAPL (e.g., during slurry wall construction, cleaning sewer sediments, excavating embayment sediments). Possible worker exposure to NAPL on the Site during excavation will be a concern, however, standard health and safety measures will be instituted to protect worker health.

Implementability

In general, remediation alternatives for the Site involve technologies and methods which have been used at other hazardous waste sites and should not lead to unusual difficulties at 102nd Street. However, some difficulties may arise requiring contingencies. Potential problem areas for each OU are summarized below.

OU-1. Almost all of the action alternatives require construction of a slurry wall, keyed into the clay/till layer beneath the Site, which will restrict groundwater migration from the Site. This remedy may encounter difficulties if the clay/till layer is non-contiguous or varies greatly in depth below ground surface across the Site. Areas traversed by the slurry wall which are highly contaminated, would require precautions to protect worker health and safety. In addition, the compatibility of the slurry wall with densely chlorinated organics in NAPL must be determined in order to ensure that NAPL will not reduce its effectiveness. Furthermore, since NAPL may extend to an unknown extent beneath the embayment area, the location of the slurry wall may need to be adjusted after excavation activities have begun to ensure the NAPL is contained.

The excavation/incineration alternatives (5A,B,C) pose the most significant implementation difficulties. In addition to the short-term permitting and health risks mentioned previously, other mitigating Site conditions must be considered. The RI report indicates that several locations on the Site received drummed wastes containing elemental phosphorus. Elemental white phosphorus combusts when exposed to the atmosphere. Although the phosphorus disposal areas generally do not coincide with the NAPL contamination areas to be excavated, the possibility of inadvertently exhuming phosphorus during excavation poses technical difficulties and potentially threatens worker safety. One area of suspected phosphorus disposal, near the OCC and Olin property boundary, is very close to the NAPL contamination area. If this precludes excavation in this area, the overall effectiveness of Alternative 5 will be reduced.

Additional implementation difficulties exist for Alternative 5C, which involves excavation of the saturated fill and soil in the NAPL contamination areas. Excavation in the saturated zone would require dewatering of the Site, which will be made more difficult by the proximity of the Niagara River. Large hydraulic gradients would exist between the dewatered area of the Site and the Niagara River, and also between the dewatered excavation trench and the bedrock beneath it. Failure of the slurry wall or the clay/till confining layer during excavation could result in a serious release of contamination to the environment and potentially threaten worker safety.

OU-2. All of the action alternatives for embayment sediments pose some technical problems due to the need to implement sediment control measures, dewater sediments, and treat the water removed from the sediment. Alternative 2A, which only dredges "hot spots," poses the fewest implementation difficulties since much less sediment is removed than in Alternatives 4 and 6. There is little difference in implementation requirements for Alternatives 4 and 6A, both of which excavate similar sediment areas and volumes. Options 2C and 6C (sediment incineration) may have permitting difficulties similar to those for the OU-1 incineration options.

OU-3. The storm sewer remediation alternatives requiring installation of a lining will require blocking the sewer during remediation activities and cleaning the sewer of sediments and other obstructions such as protruding stalactites. These activities, which are straightforward, can be accomplished without significant difficulties and will require blocking the sewer for a relatively short period of time. As described previously, the Companies found NAPL in the sewer sediments and this will require special attention to protect the health of workers during the cleaning process and will also require measures to temporarily store the NAPL contaminated sediments before they are incinerated (off-site). Sewer remediation activities should be scheduled during a dry, "low flow," period to minimize any sewer flow which must be temporarily diverted and discharged to the River.

The HDPE slipliner (Alternative 2A), poses fewer difficulties than installing an insituform thermosetting resin liner (2B). Alternative 2A also poses significantly fewer technical difficulties than plugging (3A) or excavating (3B) the existing sewer and rerouting a new sewer line around the Site. Rerouting the sewer would require as much as 8 months to complete, therefore, requiring a more elaborate sewer bypass system than 2A which is projected to take 3 months to implement. In addition, Alternative 3 requires installation and long-term maintenance of a pumping station, since the rerouted sewer would no longer be a "gravity" sewer.

Cost

Cost estimates for remediation range from $1.3 million to $376 million for OU-1, with costs for most OU-1 alternatives falling in the $9 to $21 million range. Costs for OU-2 alternatives range from $0.4 million to $13.2 million, with most in the $2 to $5 million range. For OU-3, estimated costs range from $0 to $4.95 million, with most alternatives in the $2 to $5 million range.

Cost effectiveness is an important issue in balancing the evaluation criteria used in the selection of the preferred remedy. For example, the incineration alternative for OU-1 (Alternative 5C) is nearly 20 times more expensive than the next most expensive alternative (Alternative OU-1-3F). Similarly, the comprehensive incineration alternative for sediments (OU-2-6C) would cost more than twice as much as Alternative OU-2-6A which requires the excavation and disposal of sediments beneath the landfill cap. Incineration alternatives do however provide remedies of greater permanence and greater reduction of the volume, toxicity, and mobility of Site contaminants than do alternatives which contain and isolate contamination, but such incineration options do not necessarily provide greater protection of human health and the environment.

State Acceptance

The State of New York participated jointly with EPA during all phases of the RI/FS process and supports

the preferred alternatives presented in this Proposed Plan.

Community Acceptance

The community acceptance criteria for remedy selection will be addressed after the close of the public comment period. EPA and New York State rely on public input as an important contribution to the final remedy selection, and comments at the public meeting, and those received in writing, will be considered for the final remedy selected for the Site.

The dates of the public comment period, public meeting, and persons to contact for further information are provided at the end of this document.

SUMMARY OF THE PREFERRED ALTERNATIVE

After consideration of all reasonable alternatives, the EPA recommends the remedy defined by the following alternatives for each Operable Unit:

Landfill (OU-1) -- Alternative 3F:

A synthetic-lined cap, constructed in accordance with EPA standards, will be installed over the landfill and perimeter soils.

All off-site soils above cleanup thresholds will be consolidated beneath the cap.

A slurry wall, completely surrounding the Site perimeter, will be constructed and keyed into the underlying clay/till geologic formation.

Ground water will be recovered using an interception drain installed at the seasonal low water table in the Fill. Recovered ground water will be treated in one of three off-site facilities.

NAPL beneath the Site will be recovered using dedicated extraction wells and incinerated off-site.

A 6-foot high chain-link fence will be installed around the perimeter of the cap in order to restrict access to the Site.

Institutional controls in the form of deed restrictions on the future uses of the landfill, will be established.

Embayment Sediments (OU-2) -- Alternative 6A As Modified By Alternative 2C:

Dredge sediments from the two areas which contain elevated concentrations of contaminants ("hot spots") (2C).

Incinerate these dredged sediments off-site (2C).

Dredge remaining sediments in all areas exceeding the cleanup thresholds (i.e., dredge to "clean line") to an approximate depth of 2 feet (6A).

Dewater these remaining sediments and place them beneath the landfill cap (6A). (The landfill cap is part of the prior preferred alternative, OU-1-3F)

Remove any NAPL found in the remaining sediments and incinerate it off-site (6A). (The location of the retaining berm/cutoff wall will be determined using geotechnical borings to confirm the location of the NAPL plume and assure that the slurry wall completely enclose the NAPL plume.)

Storm Sewer (OU-3) -- Alternative 2A:

Clean the existing Sewer and install an HDPE slipliner.

Remove NAPL in the storm sewer sediment and incinerate it with NAPL from the other OUs.

Rationale for Preferred Alternatives

EPA believes that the preferred alternatives for each OU will provide adequate protection of human health and the environment, and will significantly reduce or eliminate future migration of chemical waste from the Site and surrounding contaminated areas. Furthermore, the preferred alternatives will meet applicable or relevant and appropriate requirements (ARARs) and/or other To-Be-Considered guidelines (where they exist) and will reduce public health risks to acceptable levels. The preferred alternatives also assure that short-term risks associated with remediation activities will be minimized, and provide a remedy which should be completed within a reasonable amount of time. Total present worth costs estimated for the preferred alternative, $30.0M, are considered reasonable compared to the estimated costs of the most extensive remedies requiring excavation and incineration which could cost as much as $376M and require as long as 15 years to implement.

Community Role in the Selection Process

After completing the public review process, EPA, in consultation with NYSDEC, may modify the preferred

alternatives or select another response action presented in this Proposed Plan or the RI/FS, if new information or public comments indicate such action is warranted. Therefore, the public is encouraged to review and comment on any or all the alternatives identified here, including those in the FS which were not the "final-candidate" options. The public comment period will begin on **July 25, 1990** and will continue until **August 25, 1990.**

The administrative record file, containing the information upon which the selection of the response action will be based, including RI/FS reports and other site-related documents, is available at the following locations:

Michael J. Basile
U.S. EPA Public Information Office
Carborundum Center - Suite 530
345 Third Street
Niagara Falls, New York 14303

Paul J. Olivo
U.S. EPA Region II
Room 737
26 Federal Plaza
New York, New York 10278

Michael Podd
Love Canal Public Information Office
9820 Colvin Blvd.
Niagara Falls, New York 14304

Thomas R. Christoffel,P.E.
NYSDEC
50 Wolf Road
Albany, New York 12233

All written comments on this Proposed Plan or RI/FS should be addressed to Mr. Paul J. Olivo at the address given above.

Public Meeting: A public meeting will be held at the Red Jacket Inn located at 7001 Buffalo Avenue in Niagara Falls, New York, on **Wednesday, August 15, 1990**, at **7 p.m.** to present the findings of the RI/FS reports and the proposed remedy for the 102nd Street Landfill Site. For further information contact **Michael J. Basile** (716) 285-8842, or **Paul J. Olivo** (212) 264-6477.

Mailing List

If you did not receive the Proposed Remedial Action Plan for the 102nd Street Landfill Site in the mail and wish to be placed on the mailing list for future publications pertaining to this Site, please fill out, detach and mail this form to:

Michael J. Basile
U.S. EPA Public Information Office
Carborundum Center - Suite 530
345 Third Street
Niagara Falls, New York 14303

Name: _____

Address: _____

_____

Affiliation: _____

Telephone: _____

Table 1
Operable Unit One (OU1) Final Alternatives

Alternative	Landfill	Perimeter Soils	Off-Site Soils	Ground Water	NAPL	Present Worth Costs
1	Existing fence, cover	Existing cover	No Action	No Action	No Action	$1,380,000
2A	Upgrade fence, use existing cover	Secure cell	No Action	No Action	No Action	$1,800,000
2B	Upgrade fence, use existing cover	Secure cell	No Action	Cutoff wall recovery and treatment	No Action	$9,620,000
2C	Upgrade fence, use existing cover	Off-Site Incineration	No Action	Cutoff wall recovery and treatment	No Action	$9,510,000
2D	Upgrade fence, use existing cover	Secure cell	Secure Cell	Cutoff wall recovery and treatment	No Action	$9,860,000
2E	Upgrade fence, use existing cover	Stabilization	Stabilization	Cutoff wall recovery and treatment	No Action	$10,700,000
3A	Capping	Capping	No Action	No Action	No Action	$9,550,000
3B	Capping	Capping	No Action	Cutoff wall, recovery and treatment	Cutoff wall	$17,600,000
3C	Capping	Capping	No Action	Circumferent'l wall, recovery treatment	Circumferent'l wall	$16,600,000
3D	Capping	Capping	Capping	Circumferent'l wall, recovery treatment	Circumferent'l wall	$16,700,000
3E	Capping	Capping	Capping	Cutoff wall, recovery and treatment	Recovery and incineration	$21,300,000
3F	Capping	Capping	Capping	Circumferential recovery and treatment	Recovery and incineration	$20,300,000
5A	Incineration of contaminated fill, capping	Incineration	Incineration	Cutoff Wall, recovery and treatment	Cutoff Wall	$77,100,000 to $144,000,000
5B	Incineration of contaminated fill, capping	Incineration on-site	Incineration on-site	Cutoff Wall, recovery and treatment	Recovery and incineration	$80,400,000 to $148,000,000
5C	Incineration of contaminated fill and alluvium, cap	Incineration on-site	Incineration on-site	Cutoff Wall, recovery and treatment	None remains after excavation	$295,000,000 to $376,000,000

Table 2
Operable Unit Two (OU2) Final Alternatives

Alternative	Description	Present Worth Costs
1	No Action	$415,000
2	Sediment control around "hot spots," dredge "hot spots," mechanically dewater sediments, combine with Operable Unit 1 treatment alternatives:	
2A	Capping	$2,730,000
2C	Incineration	$4,480,000
4	Sediment control around "clean line," dredge sediments, dewatering cell near shoreline, extend cap over "hot spots."	$6,174,000
6	Sediment control around "clean line," dredge sediments, mechanically dewater sediments, combine with Operable Unit 1 treatment alternatives:	
6A	Capping	$5,570,000
6C	Incineration	$13,200,000
6A modified by 2C	Incineration/ Capping	$9,135,000

Table 3
Operable Unit Three (OU3) Final Alternatives

Alternative	Description	Present Worth Costs
1	No Action	$0
2	Clean existing sewer and install a storm sewer liner.	
2A	Plastic slipliner	$605,000
2B	Insituform thermosetting resin liner	$718,000
3	Excavate existing sewer and replace it with another sewer line routed around the Site.	
3A	Plug Existing Sewer	$2,990,000
3B	Remove Existing Sewer	$4,950,000