

Settlement Approval: Mr. Rosen

UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF NEW YORK

UNITED STATES OF AMERICA,
THE STATE OF NEW YORK,

Plaintiffs,

-and-

THE PROVINCE OF ONTARIO, CANADA, and
THE MINISTER OF THE ENVIRONMENT OF THE
PROVINCE OF ONTARIO, CANADA,

Plaintiff-Intervenors,

-vs-

CIV-79-988C
(S-Area Landfill)

HOOKEr CHEMICAL & PLASTICS CORP.;
HOOKEr CHEMICAL CORPORATION;
OCCIDENTAL PETROLEUM INVESTMENT CO.;
OCCIDENTAL PETROLEUM CORPORATION; and
THE CITY OF NIAGARA FALLS, NEW YORK,

Defendants.

APPEARANCES: UNITED STATES DEPARTMENT OF JUSTICE,
Environmental Enforcement Section,
Land and Natural Resources Division
(MICHAEL ELDER, ESQ., and BRUCE J.
BERGER, ESQ., of Counsel), Washington,
D.C., for Plaintiff United States of
America.

ROBERT ABRAMS, ESQ., Attorney General
of the State of New York (MARCIA J.
CLEVELAND, ESQ., and BERYL KUDER, ESQ.,
Assistant New York State Attorneys
General, of Counsel), New York, New
York, for Plaintiff State of New York.

WALD, HARKRADER & ROSS (THOMAS H. TRUITT,
ESQ., and KEITH S. WATSON, ESQ., of
Counsel), Washington, D.C.,

PHILLIPS, LYTLE, HITCHCOCK, BLAINE & HUBER
(DAVID K. FLOYD, ESQ., of Counsel), Buffalo,
New York,

and

PHILLIPS, NIZER, BENJAMIN, KRIM & BALLON.
(MARTIN B. WASSER, ESQ., of Counsel),
New York, New York for Defendants
Hooker, et al.

GELLMAN, BRYDGES, SCHROFF & SCHWEITZER
(JOEL E. SCHWEITZER, ESQ., and EARL W. BRYDGES,
ESQ., of Counsel, Niagara Falls, New York, for
Defendant City of Niagara Falls.

TERRIS & SUNDERLAND (PHILIP G. SUNDERLAND,
ESQ., of Counsel), Washington, D.C., for
Plaintiff-Intervenors Province of Ontario
and Minister of Environment.

I.

The United States Environmental Protection Agency [EPA] commenced this action in December, 1979, against Hooker Chemicals and Plastics Corporation and related corporate entities.¹ Hooker then moved to have the State of New York [the State] joined as a party defendant. Later, the State was realigned as a plaintiff. The State filed its complaint in June, 1980. The City of Niagara Falls [the City] is also a defendant in this case.

This action was commenced for the purpose of remedying the dangerous conditions existing at a chemical dump site in Niagara Falls, New York, known as the S-Area Landfill. The S-Area is one of many chemical dump sites in the City. Indeed, this case is only one of four

lawsuits against Hooker filed on the same day.² Since then, other environmental lawsuits concerning the Niagara Falls area have been filed. What makes this case particularly serious is the possibility that chemicals migrating from S-Area will contaminate the City's drinking water supply. S-Area is very close to the Niagara River, which is the source of the City's drinking water. The Niagara Falls Drinking Water Treatment Plant is just to the east of the landfill.

A settlement agreement and a proposed judgment approving the settlement have been filed with the court. At this time, the court must decide whether this agreement ought to be approved.

II.

The Landfill Site and the Water Treatment Plant

The S-Area Landfill site is a seven-acre section of land situated upon the premises of Hooker's chemical manufacturing plant on Buffalo Avenue in Niagara Falls, New York. The landfill is bounded on the north by Adams Avenue and on the west by property owned by Niagara Mohawk Power Corporation. The southern boundary consists of a power line easement and the Robert Moses Parkway. The Niagara River is just south of the parkway and is only 400 feet from the landfill's southern boundary. In fact, the S-Area is situated upon land which was reclaimed from the

Niagara River in the late 1930s and early 1940s. The factor that distinguishes this lawsuit from the others filed against Hooker is the proximity of the Niagara Falls Drinking Water Treatment Plant to the landfill site. Only 53rd Street, S-Area's eastern boundary, separates the plant from the landfill.

Hooker used the landfill between 1947 and 1961 as a repository for chemical wastes and thereafter as a site for washing equipment. The S-Area was closed in 1975. Hooker estimates that 63,000 tons of chemical wastes, primarily chlorinated hydrocarbons used to manufacture plastics, pesticides, and chemical intermediates, were dumped at S-Area during this period. About 40 percent of the chemical wastes are non-aqueous phase liquids [NAPL]. NAPL are liquids which are very dense and essentially incapable of mixing with water. There are 15 compounds which make up about 99 percent of all NAPL. The potential for NAPL migration is a major area of concern in the settlement agreement.

Geologically, the area of the landfill consists of "overburden" and "bedrock." The overburden consists of three layers of materials which differ greatly in thickness and permeability. At the top of the overburden is a porous mixture of wood, cinders, rocks, and gravel, mostly manmade. Underlying this is a layer of sand and

silts approximately 16 feet thick. Below this is a layer of clay till. This bottom layer of the overburden is of low permeability, but it varies greatly in thickness. It is thicker in the northern portion of the landfill and thinner towards the south in the direction of the Niagara River. It also has areas of "discontinuity."

Discontinuities are cracks and holes through which chemicals deposited in the site can flow into the bedrock below. The direction of groundwater flow in the overburden is to the south, towards the river.

The first layer of bedrock is called the Lockport Dolomite and is about 125 feet thick. The upper 10 - 15 feet of the Lockport Dolomite contains many fractures and is therefore highly permeable. See, e.g., Government Exhibit [GX] #13. There are fewer fractures, and the bedrock is less permeable, in the lower regions of the Lockport Dolomite. Below the Lockport Dolomite is a rock formation called the Rochester Shale. The Rochester Shale is about 60 feet thick in the area of the landfill and has a very low permeability.

The slope of the bedrock is southward at a rate of about 30 feet per mile. However, the water within the bedrock flows north, away from the river, and slightly to the west. The direction of the water flow, opposite that of the bedrock slope, is explained by the slope of the planes within the bedrock through which the water flows.

The Niagara Falls Drinking Water Treatment Plant is located across 53rd Street, just east of the S-Area. Its facilities include intake shafts and tunnels in and near the Niagara River, plus the treatment facilities located to the east of the landfill. The system provides water for about 70,000 persons.

There are actually three intake and tunnel systems now in place. One consists of a vertical intake in the East Branch channel of the Niagara River. This intake is connected to a 48-inch steel pipe laid in the overburden beneath the river. The overburden pipe is laid in a north-south direction and is connected to the forebay of a raw water pump station located just north of the Robert Moses Parkway. The distance from the East Branch intake to the pump station forebay is about 1800 feet. The East Branch overburden system was used until 1937. GX 57, App. 1.

A second intake system was built in 1937. It consists of a vertical intake structure in the East Branch connected to a tunnel laid 30 feet into the bedrock beneath the river. The tunnel is shaped like an inverted horseshoe and is 5 feet wide and 5½ feet high. The tunnel is connected to a vertical shoreshaft located just north of the Robert Moses Parkway and adjacent to 53rd Street.

The raw water pump station is a short distance to the north of the shoreshaft. The shoreshaft is connected to the pump station forebay by a raw water pipe laid in the overburden.

In 1953, the bedrock tunnel was extended approximately 3,500 feet south through the bedrock underlying the river. The combined length of the 1937 and 1953 bedrock tunnels is about 5,250 feet. The extended tunnel is connected to another vertical intake shaft in the river's "Emerald Channel." See, GX 57, App. 1. The East Branch intake which had been built in 1937 was sealed off in 1953 due to bacteriological contamination. The City's water supply was thereafter drawn from the Emerald Channel intake. Use of the Emerald Channel bedrock system was discontinued in April 1983.

In August 1978, a chemical substance was discovered in the shoreshaft adjacent to 53rd Street and also in the forebay of the raw water pump station. This discovery prompted the City to resume use of the overburden intake and pipe system in 1979. (The shoreshaft is not part of the overburden system.) The overburden system supplied the City with about 80 percent of its water, with the bedrock system supplying the other 20 percent. However, in April 1983, the city sealed off the Emerald Channel intake and shut down the bedrock

system altogether. The overburden system has supplied the City of Niagara Falls with all of its water since then.

The treatment facilities located on the property to the east of S-Area include the raw water pump station mentioned previously, two treatment plants (Plant A, built in the 1950's, and Plant B, built in 1911), and a filtered water reservoir. GX 49, App. 2. After the water travels from the East Branch intake and through the overburden pipe, it arrives at the pump station forebay, where large debris such as sticks and tree limbs are removed. Smaller debris are removed by rotating screens, and then the water is pumped to a high elevation from which it flows by gravity to Plant A. Chemicals, such as chlorine, are added to the raw water at pre-treatment channels in Plant A. From there the water flows by gravity to points in either Plant A or Plant B for more refined filtration. When the filtration process is completed, the water is stored in storage compartments in Plants A and B.

The filtered water flows by gravity from the storage compartments to a structure called the filtered water reservoir. The reservoir is a 15-foot deep reinforced concrete structure with a storage capacity of four million gallons. From the reservoir the water is directed to a pump station which distributes the water to the people of Niagara Falls. The capacity of the water

intake and distribution system is 64 million gallons per day, but the City's average daily requirement is about 35 million gallons.

III.

Procedural History of the Case

The EPA commenced this lawsuit in December 1979 pursuant to section 1431 of the Safe Drinking Water Act, 42 U.S.C. §300i; section 7003 of the Resource Conservation and Recovery Act, 42 U.S.C. §6973; section 504 of the Clean Water Act, 33 U.S.C. §1364; section 13 of the Rivers and Harbors Act, 33 U.S.C. §407. The EPA's complaint also contains a public nuisance claim.³

On December 10, 1982, the EPA filed a motion for leave to file a second amended complaint adding claims under §§104, 106, and 107 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. §§9604, 9606, and 9607. The prospects for settling this case improved shortly thereafter. The settlement of this case has mooted this motion. -

The State of New York was joined as a defendant upon a motion by Hooker granted by the court in June 1980. The State was realigned as a plaintiff and filed its own complaint later in 1980.

Four environmental organizations and the Province of Ontario filed motions to intervene in this

lawsuit in 1982 and 1983. Niagara Environmental Action [NEA] is a small group of persons who live in or near Niagara Falls, New York. The Pollution Probe Foundation is a private Canadian organization headquartered in Toronto, Ontario, Canada. Operation Clean Niagara [OCN] is a group of Canadian citizens who live near the Niagara River. The Ecumenical Task Force [ETF] is a group whose members reside in Western New York State.

Pollution Probe, OCN, and ETF filed a joint motion to intervene in March of 1983. The motion of NEA had been filed in 1982. The Province of Ontario's motion was filed in June 1983. The court granted the Province's motion in an order filed on February 10, 1984. United States v. Hooker Chemicals and Plastics Corp., 101 F.R.D. 444 (W.D.N.Y. 1984). The motions of NEA, OCN, ETF, and Pollution Probe were denied in an order filed on March 12, 1984. United States v. Hooker Chemicals and Plastics Corp., 101 F.R.D. 451 (W.D.N.Y.), aff'd, 749 F.2d 968 (2d Cir. 1984).

The road to settling this case was long, difficult, and uncertain. The first steps were not taken until a settlement agreement was reached in the Hyde Park case (see n.2, supra), because the parties agreed that that case should be dealt with before this one was discussed.

The parties to the agreement and their representatives met more than 100 times in a period of less than 3 years. My records indicate 17 meetings between the court and counsel in 1983. On more than one occasion, the Honorable Michael C. O'Laughlin, Mayor of the City of Niagara Falls, was in attendance. Members of the Niagara Falls City Council also met with the court on various occasions. Many of these meetings were convened upon very short notice to those whose participation was necessary.

This cooperative effort produced an agreement among counsel in early December 1983. Approval by the parties followed swiftly thereafter. The Settlement Agreement was formally lodged with the court on January 10, 1984.

In accordance with the federal government's policy of notifying nonparties about proposed consent judgments in cases of this sort,⁴ notice of the agreement was published in the Federal Register on January 19, 1984. Interested persons not parties to the case were given the opportunity to file written comments upon the settlement and proposed judgment. The comment period is normally 30 days, but this period was twice extended upon the request of the attorneys for the applicants whose intervention motions I denied in March 1984. However, these groups did

not file any comments. Only the government of Canada filed comments upon the proposed judgment. The EPA responded to these in May 1984.

On February 1, 1984, the court announced that a hearing would be held on the question of whether the proposed judgment should be approved. The court issued its final scheduling order on March 22, 1984. In my order denying the motions to intervene in this case, I encouraged the applicants to participate in the hearings as amicus curiae. See, 101 F.R.D. at 459. They declined to do so. See, 749 F.2d at 992-93.

The hearings extended over four days. The EPA, New York State, the Province of Ontario, and Hooker each called experts to testify about various aspects of the landfill site, the water treatment plant, and the proposed remedy. The EPA, New York State, the City of Niagara Falls, and Hooker urged the court to approve the agreement and proposed judgment without modification. Ontario's position is that the agreement should be approved only if modifications are made which would address certain areas of concern.

These proceedings concluded with closing arguments on May 31, 1984. The appeal from my order denying intervention to the four environmental groups was decided on November 15, 1984, 749 F.2d 968, thus fully

clearing the way for this court's decision on the matter now pending.

The result of these proceedings is a fully developed record. After a review of the testimony, hearing exhibits, and the arguments of counsel, I conclude that the settlement and proposed judgment adequately address the present and future problems at the landfill and water treatment plant. Accordingly, the settlement agreement shall be approved without modification.

IV.

Standard of Review

The scope of the court's review of the proposed judgment is not unlimited. The court's function "is not to substitute its own judgment for that of the parties to the decree but to assure itself that the terms of the decree are fair and adequate and are not unlawful, unreasonable, or against public policy." United States v. Hooker Chemicals and Plastics Corp., 540 F. Supp. 1067, 1072 (W.D.N.Y. 1982) (Hyde Park Landfill).

Among the factors to be considered by the reviewing court are the strength of the plaintiffs' case, the good faith efforts of the negotiators, the opinions of counsel, and the possible risks involved in litigation if the settlement is not approved. In a case of this sort, where significant public interests are at stake, the court

must also "determine whether the decree adequately protects the public interest and is in accord with the dictates of Congress. Id. at 1072-73, quoting United States v. Ketchikan Pulp Co., 430 F. Supp. 83, 86 (D. Alaska 1977). See also, United States v. Seymour Recycling Corp., 554 F. Supp. 1334, 1337 (S.D. Ind. 1982). Accordingly, the court's function is to determine whether the proposed judgment adequately and fairly addresses the problems which Congress meant to correct when it enacted the statutes upon which this lawsuit is based.

V.

The Settlement Agreement

A. General Provisions

The Settlement Agreement consists of a "Stipulation and Judgment Approving Settlement Agreement" plus five addenda, four of which outline the technical aspects of the Agreement. The objective of the Agreement is to establish and execute remedial programs in order

to protect against endangerment to human health and the environment in the S-Area/Treatment Plant Area and to protect the users of the City's drinking water from endangerment, utilizing Requisite Remedial Technology.

Agreement, ¶4(a), p. 6.

As was true in the Hyde Park case, the concept of Requisite Remedial Technology [RRT] is a crucial component of this settlement. See, 540 F. Supp. at 1077. Remedial Technology is defined as

engineering and construction practices used or accepted for use in landfill containment projects or other industrial projects which are applicable to the materials and hydrogeologic conditions found at the S-Area/Treatment Plant Area.

Agreement, ¶4(a), p.6. For determining whether a remedial technology is "requisite," the parties must consider the existing health and environmental endangerments, the likely effectiveness of applying a given technology, and the cost of applying such technology. Id. at ¶4(b), p.6.

Remediation of the landfill and treatment plant is to be attained by the development and implementation of four programs set out in intricate detail in the Agreement's technical addenda. These are: 1) the Containment Program; 2) the Monitoring Program; 3) the Maintenance Program; and 4) the Environmental Health and Safety Plan. The establishment and execution of these programs require Hooker to submit detailed plans on such matters as scientific protocols, engineering designs, construction plans, and quality control.

Before any remedial activity is undertaken, EPA and the State must review the submissions made by Hooker (and, where called for, the City). If either the EPA or the State determines that any remedial plan is inadequate, they must notify Hooker or the City within 60 days from the time the plan was submitted. Within 30 days of such

notification, any party may petition the court for a determination as to whether the remedial proposal is consistent with the Agreement.⁵ Id. at ¶7, pp. 10-11. In this way, the burdens of developing and implementing the plans for addressing the conditions at the landfill and the plant lie principally with Hooker. However, the Agreement's provisions for government supervision contemplate an active role for the plaintiffs in terms of data analysis, review of construction plans, and all other aspects of the actions that will be undertaken pursuant to the Agreement.

The Agreement also requires Hooker to insure against non-performance by reason of financial disability. Hooker must guarantee \$20 million over 35 years for costs incurred in the course of putting the remedy into place. This guarantee is limited to \$10 million following completion of construction activities associated with the landfill and plant containment program. Id., Addendum IV, ¶5.

The Agreement provides that the maintenance program shall continue for a period of 35 years following the effective date of the judgment in this case. Id., Addendum III, ¶D(1). The maintenance program may be extended if the governmental parties persuade the court

that extension is necessary to effectuate the purposes of the Agreement. Id. at ¶E. Some monitoring activities shall, in any event, continue for 3 years beyond the 35-year period. Id., Addendum II, ¶I. Hooker and the City are required to use their "best efforts to initiate and complete expeditiously" the remedial work for which the Agreement holds them responsible. The Agreement contemplates the possibility that completing the work will require the acquisition of property rights so that construction activities can be undertaken. Accordingly, Hooker and the City must use their best efforts to obtain the authorizations "necessary to carry out any of Hooker's or the City's obligations" under the Agreement. Noncompliance with the requirements of the Agreement may result in penalties of up to \$5,000 per day for each day Hooker unjustifiably fails to meet its obligations. Id. at ¶8(d), (f), pp.14, 17.

B. The Containment Program

The Containment Program details the procedures that shall be followed in order to contain and collect chemicals which have migrated from the landfill and to protect users of the City's drinking water. The program addresses conditions at the landfill itself, a small area to the north of the landfill, and the treatment plant facilities. Also part of this program is an elaborate

series of surveys and studies concerning the migration of chemicals through the overburden and bedrock toward the Niagara River. The surveys have the additional purpose of fully ascertaining the physical characteristics of the overburden.

1. Surveys and Studies

Paragraph B of Addendum I details the studies which Hooker must undertake in order to examine the migration of S-Area chemicals from the landfill in directions other than toward the water treatment plant. (That problem is addressed by Addendum I, ¶E; see pp.39-41, infra.)

The Agreement requires Hooker to drill survey wells in the overburden at 14 points outside of the landfill and plant sites. The wells shall extend down to the top of the bedrock. Wells shall be drilled to the north and south of the Robert Moses Parkway and to the east and west of the landfill. The easternmost well will be at the southeastern corner of the water treatment plant site. Hooker is required to take samples of the soil and groundwater, testing for chemicals. Logs describing the geological characteristics of the soil and rock shall be maintained. Visual and olfactory evidence of NAPL shall be noted. See Agreement, Addendum I, ¶B(1)(a)-(c), pp.I-1-4.

Hooker must also survey the bedrock beneath the overburden at 14 other locations within and outside of the landfill and plant sites. These wells shall be drilled at least to the beginning of the Rochester Shale.⁶ Based upon data collected from these 14 wells, Hooker shall determine where it shall drill six additional wells. Addendum I, ¶B(4)(a), (c), pp.I-5-6.

Following the drilling of the wells and the collection of data, Hooker must assess whether or not any NAPL or aqueous phase liquids have migrated from the landfill site. If more data must be developed to make this assessment, "Hooker shall implement a program to obtain such data. Id. at ¶B(5)(b), p.I-7. If Hooker and the governments do not agree on the assessment concerning chemical migration, the matter will be resolved by the court. Id. at ¶B(6)(a), p.I-8.

If it is determined that chemicals from S-Area have migrated towards the Niagara River through the overburden or bedrock, the Agreement requires Hooker to initiate a study as to what Requisite Remedial Technology is required to address that problem. Id. The Agreement specifically requires Hooker to determine whether or not any NAPL has migrated from S-Area into the bedrock beneath the Niagara River. Hooker must also assess the degree of human endangerment posed by such migration. Once again,

if Hooker and the governmental parties do not agree on this assessment, the matter will be resolved by the court. Id. at ¶B(6)(b), pp.I-8-9.

If it is determined that S-Area chemicals in the bedrock under the Niagara River create any human endangerment, Hooker must assess what RRT is required to address this condition. However, the Agreement specifically states that Hooker is not required to "install wells, take samples, or conduct surveys in the Bedrock beneath the Niagara River," except in connection with the Agreement's provisions relating to remedial work on the drinking water intake system. Id. at ¶B(6)(b), p.I-9.⁷

The "Surveys and Studies" section of Addendum I also sets forth the procedures which must be followed in developing RRT. These procedures are crucial to the Agreement, because RRT is specifically invoked only in relation to conditions which have not yet been determined to exist or to problems about which the parties have not yet agreed upon a means of addressing.

When the Agreement requires Hooker to submit an RRT study, Hooker must submit the study and all accompanying data to EPA and the State within 120 days of beginning the study. All RRT proposals must contain an explanation of all technologies examined and rejected, the

anticipated effectiveness of the technology selected, and plans for monitoring the technology's effectiveness. Id. at ¶B(8), pp.I-13-14.

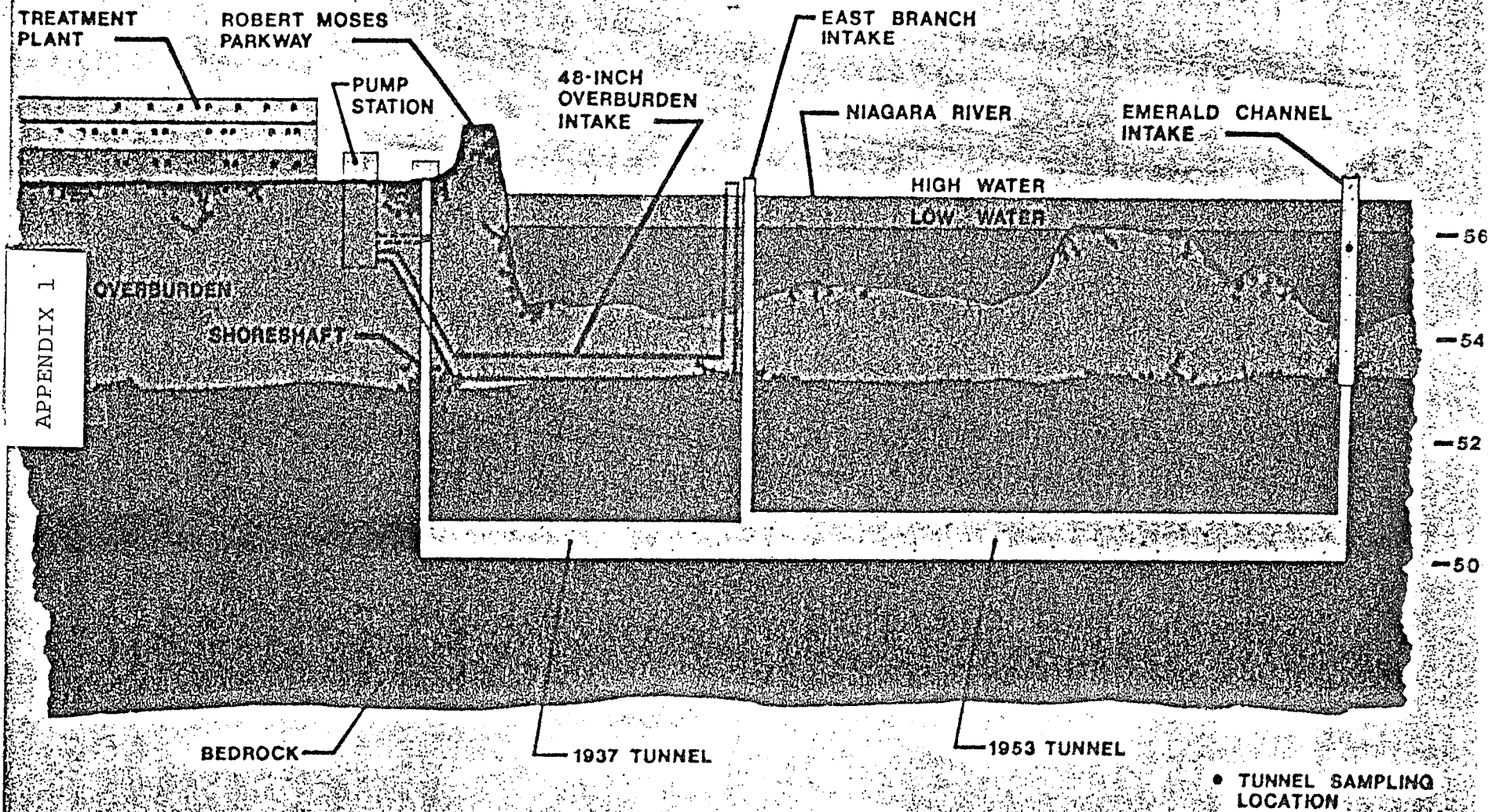
2. The Site Containment System

The Site Containment System described in Addendum I is designed to prevent off-site migration through the overburden. The plan is to install a barrier wall, a drain tile collection system, barrier plugs, and a cap. The Agreement requires Hooker to perform a thorough analysis of the overburden before installing the containment system. Identification of the more permeable sections of the overburden is especially important. Present information about the overburden is that it contains a non-continuous layer of clay till which is a natural barrier to the vertical migration of chemicals.

Hooker must undertake a series of drillings designed to identify areas in which there are continuous expanses of clay which are: 1) of very low permeability; 2) at least three feet thick; and 3) free from NAPL and solid phase chemicals. Such areas shall be called "confining layers." Addendum I, ¶C(1)(e), pp.I-18-19. Portions of the overburden not fitting this description are called "confining layer discontinuities." Id. The combination of the physical properties of NAPL and the confining layer will prevent the downward migration of NAPL through the confining layer.

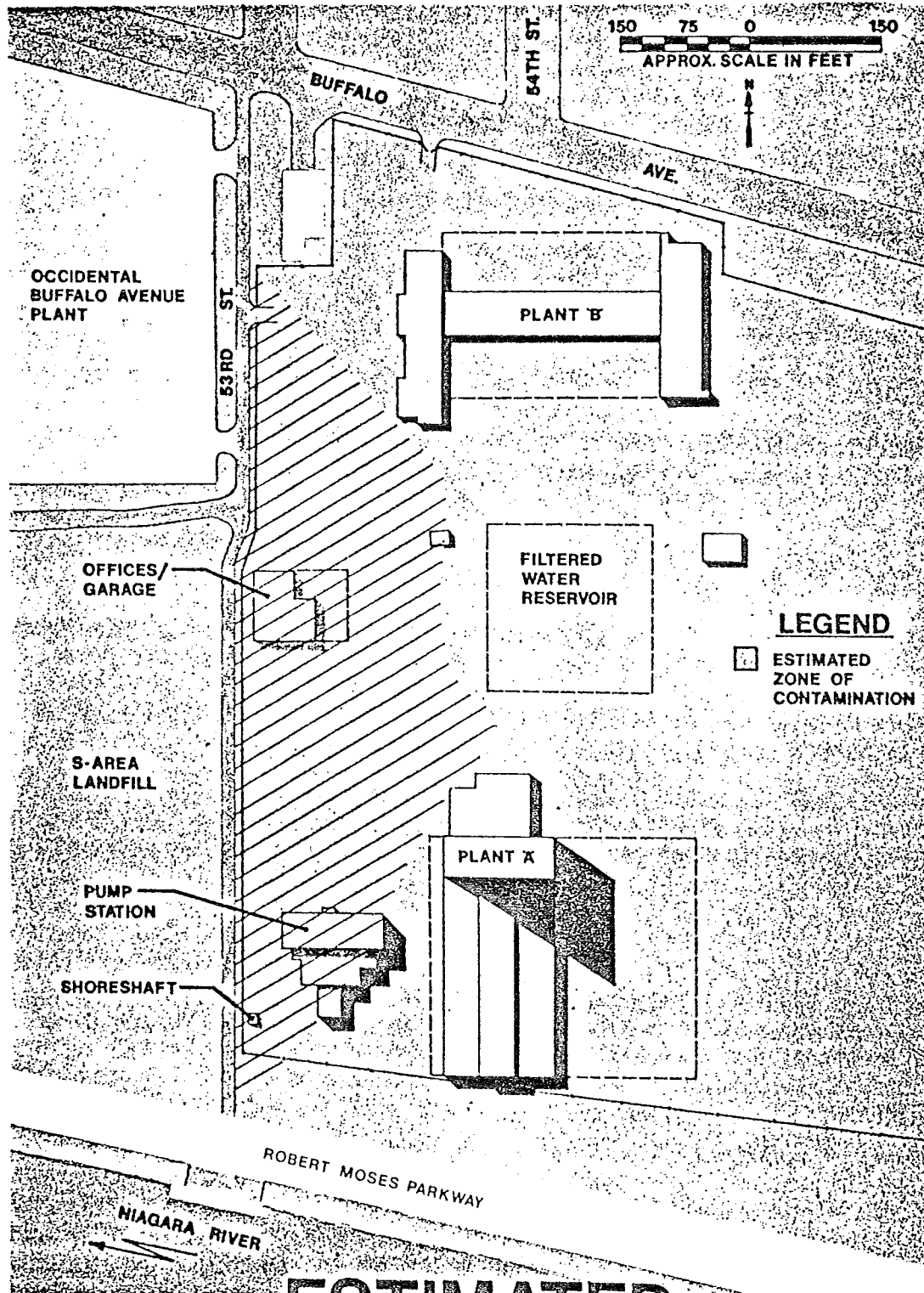
CITY OF NIAGARA FALLS WATER TREATMENT PLANT

GOVERNMENT
EXHIBIT
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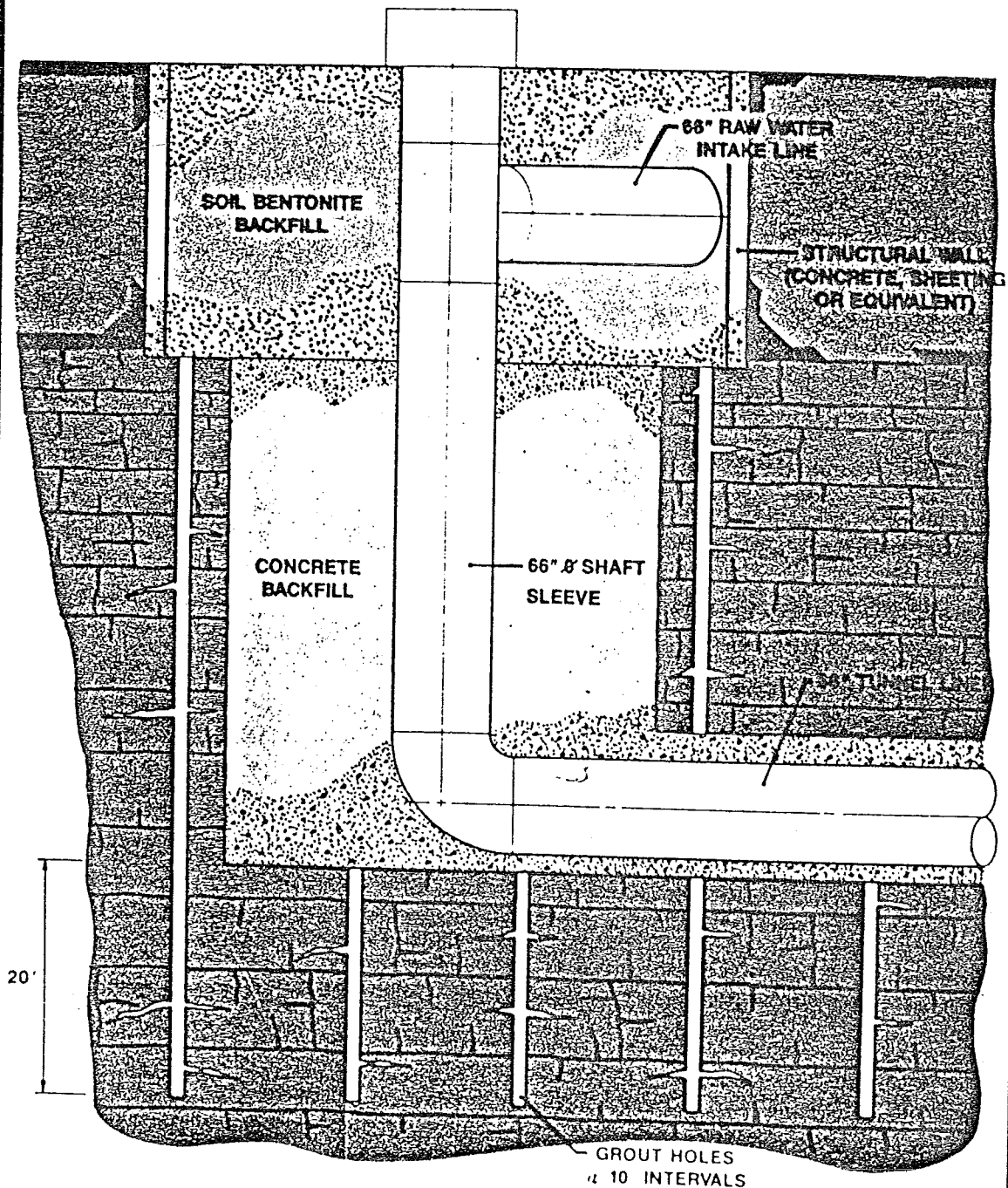
INTAKE PROFILE

CITY OF NIAGARA FALLS WATER TREATMENT PLANT

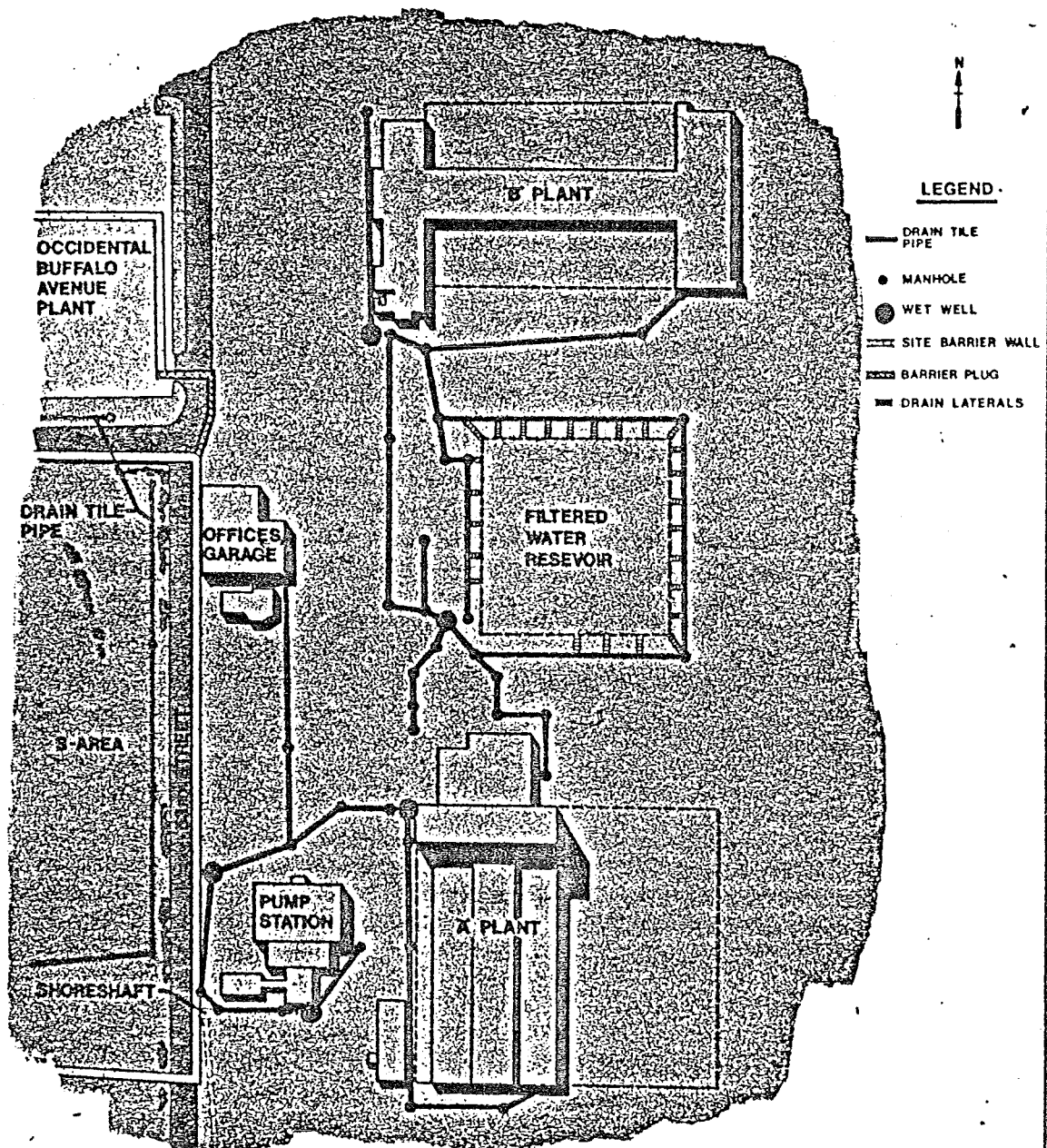


ESTIMATED CONTAMINATED ZONE

NEW SHORESHAFT SCHEMATIC



CITY OF NIAGARA FALLS WATER TREATMENT PLANT COLLECTION SYSTEM PLAN



Confining layer discontinuities will be viewed as "confining layer equivalents" if, after installation of the collection system, they are expected to be as effective as the confining layers at preventing downward NAPL migration. Id. at ¶C(1)(e)(i)-(ii), pp.I-19-20.

The Agreement requires Hooker to identify all areas which are discontinuities. All discontinuities which are not confining layer equivalents must be plugged with impermeable grouting material. This will be done by injecting the grout into the bedrock a minimum of five feet below the bedrock's surface in all areas of bedrock underlying the discontinuities. Thus, the site containment program involves the use of natural barriers to migration, the creation of artificial barriers, and plugging where natural barriers are absent and artificial barriers are unattainable.

Creating the artificial barriers (the confining layer equivalents) is the most difficult aspect of the site containment program. The parties to the Agreement are satisfied that the downward flow of NAPL into the bedrock can be prevented in areas of discontinuities by installing the barrier wall, the cap, and then the drain tile system.

The barrier wall will be built around the perimeter of the landfill. It will be made of low

permeability material and extend at least one foot below the top of the confining layer. Agreement, Addendum I, ¶C(3)(a), p.I-23. The wall is not intended to be a barrier to chemical migration. The purpose of the wall is to reduce the flow of groundwater into the landfill from the outside. This will help lower the water table in the overburden within the wall.

The cap will have a similar function. It will be almost impervious to water and thus prevent rain water and surface moisture from seeping into the overburden. The result will be to lower the water table in the overburden.

A drain tile collection system will be installed after the wall and cap are completed. The system will consist of pipes, drains, and pumps which will collect groundwater and NAPL and pump it to the surface. The purpose of the tile system is to contain and collect NAPL in areas of confining layer discontinuities. Tr. III-A, pp.39-40.

The functioning of the drain tile system depends upon the lowering of the water table inside the barrier wall relative to the level existing outside the wall. Groundwater always flows from higher pressure to lower pressure. Tr. I-B, p.10. The water in the bedrock below will also be at a pressure considerably higher than that

in the overburden. Together, these factors will cause the groundwater to flow upward (and inward from the wall) with a force sufficient to counteract the natural downward flow of NAPL through confining layer discontinuities. Tr. III-A, p.46.

The drain tile system will thus prevent the flow of NAPL and contaminated groundwater through discontinuities into the bedrock below. The water and NAPL collected in this way will be pumped to the surface. The chemicals will then be incinerated. This reverse gradient method of collecting and containing wastes has never been implemented in a landfill cleanup effort. However, it has been used extensively and successfully in commercial endeavors such as extracting oil from the ground where there is an abundance of groundwater.

The feasibility and effectiveness of the collection system proposed for S-Area was explained by Dr. George F. Pinder. Dr. Pinder is a distinguished expert in the field of hydrology, which is the science relating to the properties and movements of water in soil and rock formations. He is chairman of the civil engineering department at Princeton University, holds a Ph.D degree in geology, and has received awards for his contributions to the field of hydrogeology. Tr. III-A, p.15. His curriculum vitae (GX 90) lists dozens of scholarly

publications. In addition, Dr. Pinder has published three books and several other papers not listed on his resume. Tr. III-A, p.16.⁸

Dr. Pinder has also done extensive consulting work on actual projects requiring expertise in hydrogeology. These involved the use of computer simulation and mathematical modeling. When enough data are gathered and analyzed, the behavior of a groundwater system can be understood well enough to develop a mathematical model which simulates how the problems within the system can be addressed. Tr. III-A, pp.23-26. Dr. Pinder explained that the physical characteristics of the groundwater system are translated into mathematical language. Equations are used to describe the workings of the system. The accuracy of these equations is tested by comparing them with what actually occurs within the groundwater system. This process was used to develop a model strategy for addressing the problems in the S-Area groundwater system. The model is called the "S-Area Two Phase Flow Model" (GX 89). "Two Phase" refers to the chemical properties of the materials in the landfill: aqueous and non-aqueous phase liquids. The movement of aqueous phase liquids will be affected by the presence of NAPL. Tr. III-A, pp.33-36.

The S-Area Two Phase Flow model was developed by Arthur D. Little, Inc., in consultation with Dr. Pinder. Tr. III-A, pp.41-42. The purpose of the model is to simulate the vertical two phase flow in the confining layer discontinuities at S-Area. Id. It is Dr. Pinder's opinion that the two phase flow model developed by A. D. Little is adequate to predict the response of NAPL to the upward flow of groundwater in confining layer discontinuities. Tr. III-A, p.45.

Dr. Pinder also testified that it will be possible to achieve the upward flow necessary to prevent downward NAPL migration. He stated that the installation of the drains and barrier walls will lower the water table enough so that an upward gradient will be achieved. He also noted that the slope of the clay till is toward the areas of discontinuity. Thus, NAPL will flow toward the areas where the upward gradient is created. At these points, NAPL will be contained, collected, and removed. Tr. III-A, pp.46-47.

C. Drinking Water Intake and Treatment Systems

The Settlement Agreement requires Hooker to address the problem of chemical migration from S-Area towards the drinking water treatment plant and the drinking water intake system. Chemicals which have migrated to the area of treatment facilities must be

contained and collected. Moreover, Hooker must construct a new drinking water intake system.

1. Drinking Water Intake System

The goal of this portion of the Agreement is to put the bedrock intake system back into service. The City entirely discontinued use of the bedrock system in 1983. The shutdown of the bedrock system came after the discovery of chemical contamination in the system in 1969 and later in 1978. The contamination observed in 1969 was foul-smelling, black sludge with a density greater than water found in the bedrock shoreshaft (see, GX 57, App. 1). Similar matter was discovered in 1978 in the shoreshaft and the forebay of the raw water pumping station. Tr. II-B, pp.108-09; Affidavit of Walter K. Morris, ¶32, p.12, Docket Item 125. Non-aqueous phase contamination was also found 225 feet outward from the shore along the bedrock tunnel intake. This was the section constructed in 1937.

An unconfirmed sample indicated the presence of aqueous contamination 1,750 feet out along the bedrock tunnel. All samples taken between the 225 feet and 1,750 feet marks were "clean." The extension of the tunnel built in 1953 has never been tested for the presence of NAPL. Tr. II-B, p.108; II-A pp.33-34. In accordance with these findings, the remedy for the bedrock intake system

is particularly intensive with respect to the 1937 section of the tunnel. The Agreement presumes "that NAPL is in the bedrock adjacent to the 1937 section, or that it may be in the bedrock sometime in the future. Tr. II-A, p.6. The goal is to rebuild this section of tunnel so that NAPL cannot enter it.

The remedy begins with the 66-inch raw water pipe that connects the bedrock shoreshaft to the raw water pumping station. This pipe shall be hydrostatically tested for leakage and shall either be repaired or replaced if the tests reveal that it is not "watertight under a pressure equivalent of 50 feet of water for two hours." Agreement, Addendum I ¶E(10)(a), p.I-52; Tr. II-A pp.7-8.

The bedrock shoreshaft will also be rebuilt. See, GX 60, App. 3. Hooker must ultimately remove and replace the shoreshaft with watertight lining. Hooker Post-Hearing Memorandum, Docket Item 172, p.12. The bedrock surrounding the shoreshaft shall be grouted to minimize leakage into the shoreshaft. Grout holes shall be drilled into the bedrock at 10-foot intervals to depths of about 20 feet. See GX 60, App. 3.

A structural wall shall be built around the shoreshaft above the bedrock. This will facilitate the construction activities necessary for removing the

shoreshaft. The shoreshaft will then be removed. A 66-inch pipe will then be installed. Next, the space between the bedrock and the pipe shall be grouted. Tr. II-A, p.9. The portion of the shoreshaft extending upward out of the bedrock shall be surrounded with soil bentonite backfill. This is a low-permeability material which will replace the overburden which now surrounds this section of the shoreshaft. Tr. II-A, p.10; GX 60, App. 3.

The next area addressed is the horizontal bedrock tunnel built in 1937. First, holes will be drilled into the bedrock surrounding the tunnel in its present condition. The holes shall be drilled at angles crossing the rock's bedding planes. Impermeable grout material shall be used to fill the grout holes. The purpose of this grouting is to "minimize groundwater flows into the Tunnel and Shaft during construction activities." Agreement, Addendum I, ¶E(10)(d), p.I-54.

Second, the concrete which now lines the 1937 tunnel will be removed. The tunnel shall be inspected for the presence of NAPL while the existing concrete liner is removed. Id. at ¶E(10)(e), pp.I-54-55. A new pipe sleeve shall then be installed. The sleeve shall be made of material tested to insure a 100-year life span in the physical and chemical environment into which it will be placed. Next, the space between the sleeve and the tunnel shall be grouted. Id. at ¶E(10)(e)-(g), pp. I-54-56.

The Agreement sets forth a phased approach for the Emerald Channel Tunnel. As previously noted, this tunnel was built in 1953 as an extension of the 1937 East Branch bedrock tunnel. The 1953 section begins 1,750 feet out from the shor shaft and extends another 3,500 feet into the Niagara River. The Agreement requires dewatered testing for chemicals from S-Area or Hooker's Buffalo Avenue plant. Leakage of water into the tunnel must be noted and measured. Grouting must be undertaken to correct visible leakage. If chemicals are found in the tunnel, Hooker must install an impervious tunnel sleeve.⁹ The City must also undertake a continuing water quality monitoring program.

Initially, Hooker must dewater the 1953 tunnel and intake shaft. The tunnel and shaft shall then be inspected for NAPL or for groundwater leakage through cracks and joints. Groundwater leakage must be analyzed for chemical contamination. If NAPL is found in the system or if contaminated water is detected, Hooker must assess whether the contamination came from S-Area or its Buffalo Avenue plant site and, if so, whether it leaked through the existing liner of the Emerald Channel tunnel or shaft. Agreement, Addendum I, ¶E(11)(a)-(c), pp.I-56-57.

Hooker must install an impervious sleeve in the tunnel and shaft if NAPL or contaminated groundwater is found in the shaft or tunnel, unless 1) the contamination came from places other than S-Area/Buffalo Avenue plant, or 2) the contamination did not enter through the existing liner.¹⁰ Id. at ¶E(11)(e). Hooker's assessments on the source of contamination and the path of its migration are subject to dispute by the governments. For example, if Hooker does not believe contamination came from the S-Area/Buffalo Avenue plant or that it did not enter through the existing liner, the federal or state government may disagree. The court shall then resolve any such disagreement. Hooker must then proceed in accordance with the court's order. Id. at ¶E(11)(d).

Even if re-sleeving is not required, Hooker must seek the elimination of any groundwater leakage into the tunnel or shaft which is noticed during the dewatered inspection. Such leaks must be addressed by "grouting to consolidate the Bedrock surrounding the Tunnel and [intake] Shaft." Id. at ¶E(11)(g)(iii), (j), pp.I-59-60; GX 64.

Hooker is next required to conduct a test on the amount of groundwater leaking into the tunnel or shaft. If the amount of leakage exceeds 3,500 gallons per day, Hooker must do additional grouting to eliminate the leaks.

Additional leakage tests will then be performed. Grouting shall follow and continue until the 3,500 gallon-per-day standard is attained. This standard represents one gallon per linear foot of tunnel per day. This is considered a very small amount of leakage for a tunnel of this kind.

The portions of the entire intake system (including the East Branch tunnel) in which construction or grouting is undertaken must be cleaned. The new system shall then be available for service. Id. at ¶E(12)(b), p.I-62.

If the results of the leakage test referred to above require Hooker to do additional grouting, then the Emerald Channel tunnel must be dewatered one year after the bedrock intake system is put back into service. An inspection will be undertaken for the presence of NAPL, possible contamination of water leaking to the tunnel, and for excessive leakage. If all tests are passed (using the same criteria used in the initial dewatered inspection), then the Emerald Channel system can be put back into service. If the system is thus restored to service, another dewatered test will be conducted five years later. Id. at ¶E(14)(b), p.I-63; Tr. II-A, pp.18-19. However, if there is NAPL contamination, contaminated water, or excessive leaking, Hooker must re-sleeve the Emerald Channel intake system.

Hooker will not be required to undertake dewatered testing one year after the system is initially placed into service if the initial dewatered test reveals less than 3,500 gallons of leakage per day. However, Hooker will still be required to dewater and test the system five years after it is placed into service. Hooker must at that time re-sleeve the tunnel if it fails to meet the aforementioned contamination and leakage requirements. Id. at ¶E(14)(c).

There will be no dewatered inspections after the one completed in the fifth year after the Emerald Channel system is placed into service (or in the fifth year after the one-year inspection, if that is required). However, the raw water from the Emerald Channel intake system shall be monitored for the entire life of the system unless Hooker installs a new sleeve. Id., Addendum II, ¶E(7), p.II-36.

The Agreement compels the City to conduct monitoring which will compare water quality in the Niagara River's Emerald Channel with water taken from the shoreshaft.¹¹ Twenty "grab samples" shall be taken over a period of 20 to 30 days. Water shall be taken first from the Emerald Channel and then from the shoreshaft as soon thereafter as possible. The idea is to compare water originating from the same area at the same time at the two

extreme points of the raw water intake system. Differences in purity will indicate contamination in the bedrock tunnel. This sampling shall be conducted quarterly in the first year after the bedrock intake system is placed into service and every six months thereafter. Id. at E(1)(a), pp.II-32-33.

The above-mentioned sampling shall analyze the water for hexachlorobutadiene 2, 4, 5--trichlorophenol, trichlorobenzenes, and hexachlorobenzene at levels above prevailing state or federal drinking water quality standards. The City must notify the other parties to the Agreement if the tests indicate the presence of the aforementioned substances at higher levels. Id. at ¶E(1)(b), p.II-33.

After a year of this comparative sampling, Hooker must develop a statistical protocol for the purpose of assessing whether there has been a comparatively larger increase of chemical concentrations in the shor shaft as opposed to the river itself. Id. at ¶E(2), p.II-34. If the assessment done pursuant to the protocol reveals a statistically significant increase in shor shaft concentrations as compared to river concentrations, the City shall immediately prevent water in the Emerald Channel tunnel from reaching the treatment plant. Hooker must then install a new sleeve to the tunnel unless it is

determined--by agreement or court order--that S-Area/Buffalo Avenue plant chemicals did not leak through the system's existing liner. Id. at ¶E(5), (6), pp. II-35-36.

The court is satisfied that the program for rebuilding the intake system adequately protects the City's drinking water from chemical contamination for which Hooker is responsible as a result of its chemical dumping at S-Area and the Buffalo Avenue plant site. The remedy is premised upon assumptions which have not been proven conclusively. One assumption is that NAPL is likely to migrate through the bedrock as far out as the Emerald Channel intake shaft. Another assumption is that NAPL may leak through the existing Emerald Channel liner. Nonetheless, the Agreement binds Hooker to a program of testing to determine whether Hooker must re-sleeve the Emerald Channel tunnel.

More important is the assumption that the problems with the 1937 portion of the tunnel are due to the migration of chemicals Hooker dumped into the sites being addressed by this lawsuit. This assumption is reflected in the requirement that Hooker completely rebuild the 1937 portion of the bedrock tunnel. The reconstruction of this part of the tunnel will prevent chemicals from entering the intake tunnel even if they are

in the surrounding bedrock. The testing of the 1953 tunnel will determine the need to re-sleeve it. A new sleeve will protect drinking water from chemicals in the surrounding bedrock.

Walter K. Morris, the expert called by the EPA to explain the intake system remedy, explained that the protection of the City's drinking water was the governments' "highest priority." Accordingly, "whenever there was any question, and I mean any question, we came down on the side of the conservative approach." Testimony of Walter K. Morris, Tr. II-A, p.42. It was Mr. Morris's opinion that the procedures set forth in the Agreement will protect the East Branch and Emerald Channel Intake systems and the City's drinking water from contamination. Id. at 13, 22. The record supports this conclusion, and the court accepts it.

2. Protection of the Water Distribution System

The Agreement also addresses the structures involved in treating and distributing the City's water. The corrective measures addressing the treatment of the drinking water are relatively simple: any structure that comes into contact with drinking water must be cleaned. Every structure must be dewatered and inspected. Id. at 24-25. The objective is to eliminate the effects of past contamination from S-Area chemicals which have been found

in some of the treatment plant's structures. Mr. Morris noted that S-Area chemicals have been detected in the forebay of the raw water pump station, the plant's chemical pre-treatment channels, and the filter media in the filtration system. Morris affidavit, Item 125, ¶62.

Each of these structures shall be cleaned or, in the case of the filter media, replaced. Agreement, Addendum I, ¶E(17), (18), pp.I-65-70. Experts from EPA, the State, and Hooker will inspect the treatment plant structures. Either governmental party may request that Hooker evaluate whether the plant cleanup project has succeeded in protecting the people of Niagara Falls from endangerment from S-Area chemicals. If the parties agree, or if the court finds, that the cleanup effort was unsuccessful, Hooker must set forth what RRT, if any, is necessary to deal with the persisting contamination. Id. at ¶E(20), pp.I-71-72.

Hooker and the City of Niagara Falls are required to initiate a daily program for monitoring the drinking water distributed to consumers. The City must take daily samples from a distribution water tap located at the treatment plant. This water shall be monitored for five S-Area indicator chemicals. Id., Addendum II, ¶F(1).¹² If monitoring shows levels of chemical indicators higher than those specified in the Agreement,

and if this condition is found to be the result of chemicals migrating from S-Area into the treatment plant water supply, the City must try to correct this problem. If the City's efforts are unsuccessful, Hooker must determine what RRT is required to bring the distribution system back into compliance with the standards established by the Agreement. Id. at ¶F, pp.II-36-39.

The court believes that this monitoring program provides adequate assurance that the people of Niagara Falls will be protected against contamination from S-Area chemicals. Alternative remedies such as abandoning the present facility and building another have not been shown to be necessary. Indeed, they are neither practical nor feasible.

The expense of relocation would be tremendous--about \$50 to \$60 million at current price levels-- and the benefits would be uncertain. There are about 140 hazardous waste sites within three miles of the Niagara River. Finding a site free of the problems presented by the current site might not be possible. Relocation of the water treatment plant would not, therefore, be of any obvious benefit.

Moreover, we must remember that this case is in a settlement posture. It is purely speculative to argue now that the court could--after an extensive trial--order

Hooker to build a new plant. Indeed, it is somewhat speculative even to argue that a post-trial order in this case would direct Hooker to undertake a remedial program as extensive as the one bargained for by EPA and New York State. The remedy for the drinking water system provided in the Agreement is thorough, flexible, and adequate.

D. Containment Program at Treatment Plant Property

The Agreement also addresses the problems presented by the migration of S-Area chemicals to areas surrounding the treatment and storage facilities at the water treatment plant. These structures include a pump station, two filtration plants, and the filtered water reservoir. The location of these structures and their proximity to S-Area is depicted on GX 49, App. 2.

A drain tile collection system shall protect the pump station from chemical contamination. Hooker must also conduct tests to determine whether it is necessary to build collection systems around the filtration plants and the reservoir. The tile collection system protecting the pump station is called the "Pump Station Collection System." The pump station is the facility which distributes finished water to the people of Niagara Falls. It is located in the southwest corner of the water treatment plant. The pump station collection system will surround the pump station on all sides except a portion

facing the northeast (i.e., away from the landfill). The system will not be installed until Hooker assesses the geological characteristics of the surrounding overburden. Agreement, Addendum I, ¶E(1)(a). The final plans for the system will reflect that assessment.

A critical aspect of the pump station project is the replacement of parts of two water mains which carry finished drinking water to the distribution system. These mains run along the western boundary of the treatment plant property. This is the side of the plant that runs along 53rd Street, adjacent to the S-Area. The section of the mains between the pump station and the offices and garage (see, GX 49, App. 2) must be replaced. The remaining section of the pipes shall be replaced if they are found to contain NAPL or solid phase chemicals which have migrated from S-Area. Agreement, Addendum I, ¶E(1)(d), p.I-37.

If tests undertaken by Hooker reveal endangerment to the filtration plants and filtered water reservoir by S-Area chemicals, Hooker must install drain tile collection systems around those structures. See GX 52, App. 4. These systems would completely encircle the reservoir and partially surround the filtration plants. They would be designed to collect and pump out S-Area chemicals. Agreement, Addendum I, ¶E(2), pp.I-37-39.

The court finds that the Agreement's plan for protecting the structures of the water treatment plant adequately addresses the present and possible future threat of chemical contamination. The parties have established a program which has struck an appropriate balance between projects which must certainly be completed (e.g., pump station collection system and replacement of finished water pipes) and those which shall be undertaken if so indicated by the surveys which Hooker is required to undertake.

VI.

Ontario's Opposition

A. NAPL Migration in the Bedrock

Ontario, the plaintiff-intervenor, opposes approval of the Agreement in its present form. The Province's major concern is that it does not adequately guard against the risk that NAPL will migrate south through the bedrock beneath the Niagara River toward the Canadian side of the border.

The Province called only two witnesses to testify at the hearing. Dr. Donald MacKay's testimony was brief. His major point was that the chemicals in the landfill would retain their dangerous properties for hundreds of years. However, neither he nor any other witness offered evidence suggesting that the containment

program would not work. Dr. Edward Martin was called by the Province to testify on incineration technology.

Significantly, Ontario decided at the last moment that it would not offer the testimony of Dr. G. E. Grisak, the one witness who was to testify on the subject of under-river NAPL migration. Instead, the Province relied mainly upon the implications of cautious assumptions made by the parties to the Agreement as reflected by the remedy for the bedrock tunnel intake system. Thus, Ontario suggests that the very existence of an elaborate and thorough remedy for the bedrock tunnels is a tacit admission by the Agreement's proponents that there is a significant potential for NAPL to migrate through the bedrock toward Ontario.¹³

The Province also noted that neither Hooker nor the plaintiffs have tested the bedrock beneath the river for toxic chemicals. However, the plaintiff-intervenor has not tested this area either. No party to this agreement has or could have prevented such testing from taking place. The settlement whose approval is now awaited requires Hooker to perform bedrock surveys for chemical contamination. Agreement, Addendum I ¶B(4)(a).

The intervenor complains that the Agreement does not require offshore bedrock surveys. See, id. at ¶B(6)(b). However, the Province did not demonstrate at

this hearing that offshore bedrock surveys are necessary. The Agreement compels Hooker to do an onshore survey of the bedrock for contamination. Hooker must develop an RRT proposal, subject to EPA/State approval, if S-Area contaminants are in the bedrock and pose a danger.

EPA/State's extraction of this obligation from Hooker without a trial is certainly an indication of a good faith effort to obtain the best agreement possible. The intervenor has advised the court why the intervenor would not have signed this Agreement. But the intervenor has failed to convince the court why the court should not approve it.

B. The Remedy's Consistency with the Requirements of Federal Law

The Province argues at length that the containment/collection strategy provided in the Agreement does not comport with the policy of the United States regarding remedies for the dangers posed by inactive landfills such as S-Area. Ontario suggests that only an explicit requirement to remove the chemicals from S-Area would bring the Agreement into compliance with federal law.

Reference is made to the Comprehensive Environmental Response, Compensation and Liability Act of 1980 [CERCLA], 42 U.S.C. §9601, et seq., the Resource

Conservation and Recovery Act [RCRA], the 1984 RCRA reauthorization statutes, and EPA regulations. These provisions are relied upon for the proposition that containment programs for landfills offend public policy. This reliance is misplaced, and the proposition is incorrect. Federal law does not prohibit the containment program proposed here, and it does not require what the Province demands.

Initially, it must be emphasized that the containment programs set forth in the Agreement will be designed to contain and collect chemicals. The chemicals that are collected will be incinerated or disposed of by other appropriate means. Therefore, it is clear that the proposed remedy for S-Area does not rely entirely upon containment.

It is true that Hooker's major obligation will be met if it can prevent the off-site migration of chemicals. Ontario takes note of the fact that no "performance standard" of collection is stated in the Agreement. The proponents argue that it is not possible to establish such a standard. They note that chemicals have been deposited in various ways, including direct dumping without containers and depositing containers of greater or lesser permeability. In one case, a railroad tank car was deposited into the landfill. In any event,

the court concludes that a program which relies upon containment as a minimum requirement and which is designed to collect chemicals in areas where there are paths for off-site migration is fully consistent with federal law.

As this court noted in the Hyde Park case:

The basic concern which underlies this lawsuit is not the presence of the chemicals in the Landfill itself but the fact that these chemicals will migrate away from the Landfill toward the Niagara River and Lake Ontario. Given the deadly toxicity of these chemicals in even minute dosages, the specter of these wastes seeping into the Niagara River is indeed frightening.

540 F. Supp. at 1073 (emphasis added).

The dangers which the court recognized in Hyde Park are, if anything, more frightening in this case. The court has not forgotten these dangers. A successful containment program which prevents migration away from the landfill will prevent these dangers from arising. Accordingly, such a program is consistent with current public policy. United States v. Hooker Chemicals and Plastics Corp., 540 F. Supp. 1067.

CERCLA does not prohibit containment as a means of dealing with inactive landfills such as S-Area. Two types of governmental responses are provided in CERCLA: "remove" or "removal" and "remedy" or "remedial action." These responses are defined, respectively, in paragraphs 23 and 24 of section 101 (42 U.S.C. §9601(23), (24)).¹⁴

Neither response precludes the implementation of an effective containment program.

Ontario seizes upon the fact that remedial actions must be "actions consistent with a permanent remedy." 42 U.S.C. §9601(24). However, the statute also provides that remedial action includes "storage, confinement, perimeter protection using dikes" and other activities besides excavation and incineration. Ontario deals with the contradiction apparent in its position by arguing that "non-permanent" actions are permitted so long as they do not block the achievement of a permanent remedy. See S.Rep. No. 96-848 (June 11, 1980), 96 Cong. 2d Sess. Thus, it is suggested that responses short of excavation are permitted to the extent that they are precursors to emptying the landfill. However, the words of the statute clearly indicate that a reliable program of confining chemicals to their present location is sufficient to satisfy the requirements of the law.

Of course, the court recognizes that where excavation and incineration are practicable and safe, such procedures are superior to containment. However, excavation is peculiarly difficult at sites like S-Area, and it would be prohibitively expensive to attempt it there at this time.

S-Area's location near the Niagara River means that a considerable amount of water would be encountered once the water table is reached in the overburden. This water's chemical contamination must be dealt with by means other than simply diverting it. Tr. III-B 57 (Testimony of Frank Rovers). Two transmission towers on the landfill site, one on either side of the S-Area, would have to be relocated before excavating the landfill. Further, industrial water intake trenches and pipes would have to be relocated. Id.

After clearing away these obstacles, the task at hand would be to dig up 900,000 tons of earth. This figure includes only the overburden, not the bedrock. A water-filled hole would remain when the overburden is removed. The hole would need to be backfilled. The total cost, including safety precautions, would be about \$42 million. Id. at pp.56, 58.

This \$42 million figure does not include such costs as the temporary interruption of power and water while relocating the transmission towers and water pipes nor the cost of relocating two storage lagoons located at S-Area. Moreover, the lateral support for such an enormous excavation would be a continuing concern. Id. at p.59.

Dr. Edward Martin, an environmental engineer, testified for Ontario about the feasibility of incineration. He was a most informative witness on the topic of incineration technology, but he did not dispute the substance of Mr. Rovers' testimony about the costs of excavating the landfill. Dr. Martin did suggest, in general terms, that there were alternatives to bulldozing the landfill, but he did not offer any alternative which he knew to be suitable for S-Area. Tr. IV. at pp.46-47.

Even if the landfill could be excavated, the entire problem still would not be solved. The material would have to be incinerated at S-Area or at another site. Transportation to another site would bring about other dangers. After incineration, some waste material would remain, though its toxicity would be reduced. This would have to be disposed of in some fashion, perhaps in a landfill. The court is unwilling to impose upon the parties a requirement to undertake a project which is so costly and uncertain, especially when the party proposing it has not shown that the technology is presently available.

The existence of landfills such as S-Area is a problem of frightening magnitude and limitless hazards. The hazards must be dealt with by remedies that are both effective and within our abilities to deliver. The court

believes that this settlement agreement meets both of these requirements.

Ontario's argument that the Agreement is contrary to the policy reflected in RCRA need not detain us long. Even if the recent amendments to the statute are considered, no infirmity in the Settlement Agreement is indicated.

In the Hazardous and Solid Waste Amendments of 1984, Congress added provisions to RCRA which Ontario views as especially pertinent here. For example, 42 U.S.C. §1002(b) is amended to add a subdivision (7) which states that "reliance on land disposal should be minimized" and that "landfill and surface impoundment, should be the least favored method of managing wastes." The other amendments to RCRA reflect today's strong bias against further depositing of hazardous chemicals into landfills.

These amendments apply to future disposal of chemicals in landfills. The court is sensitive to Congress's developing negative attitude towards burying hazardous wastes. And the court does not, by approving the instant settlement, imply that new developments in environmental policy are irrelevant in determining whether a settlement should be approved. It may well be that a containment program would be legally insufficient at a

site where excavation and incineration are possible, practicable, and safe--even if more costly. But this is not the case at S-Area.

Finally, it should be noted that the concept of "Requisite Remedial Technology" is very flexible. If the containment program now proposed does not work, RRT must correct the defect. Excavation and incineration are not excluded from the realm of possible future alternative solutions if they become necessary.

VII.

Enforcement of the Agreement

The parties to the Agreement are expressly authorized to enforce its terms. Hooker must carry the substantial burdens imposed upon it. It is the essence of this settlement, as it is with all settlements, that a party shall not be burdened with obligations to which it has not agreed, unless there is a judgment of liability against it.

This court has had some experience enforcing the settlement agreement reached in the Hyde Park case. It has been the court's practice to hear and consider the written and oral arguments of intervenors who are concerned with enforcing the terms of the agreement.¹⁵ The parties to the Agreement reached in this case have no objection to employing this practice in the present case.

See, remarks of counsel, May 31, 1984, Docket Item 181 (transcript), pp.125-28. Accordingly, when questions concerning the enforcement of the Agreement are raised, the court will consider the views of Ontario if the Province desires to be heard. The Province's participation is welcomed and encouraged.

VIII.

Conclusion

The proposed Settlement Agreement is fair, adequate, and consistent with public policy. The approval and implementation of the Agreement will adequately protect the public interest in health and the environment. Accordingly, the Agreement is hereby approved without modification.

So ordered.


JOHN T. CURTIN
United States District Judge

Dated: April 15, 1985

FOOTNOTES

1

The corporate entities named as defendants in this action include Hooker Chemicals and Plastics Corp., Hooker Chemical Corp., Occidental Petroleum Investment Co., and Occidental Petroleum Corp. These defendants are referred to collectively as "Hooker" throughout the Settlement Agreement and in this opinion.

2

The other cases filed with this lawsuit are U.S., et al. v. Hooker, et al., CIV-79-987C (102nd Street Landfill); U.S., et al. v. Hooker, et al., CIV-79-990C (Love Canal); and U.S., et al. v. Hooker, et al., CIV-79-989C (Hyde Park Landfill). A settlement agreement was lodged and approved in the Hyde Park case. 540 F. Supp. 1067 (W.D.N.Y. 1982). The case of U.S. v. Niagara Falls, CIV-81-363C, filed in 1981, involves the Niagara Falls Waste Water Treatment Plant. The waste water plant is one of the nation's worst municipal polluters. A settlement has been reached in that case. Also before this court is New York State v. Occidental Chemical Corporation, CIV-83-1393C, which involves Occidental's plant in Niagara Falls, near S-Area. Most recently, a settlement was reached in the case of State of New York v. Olin Corporation, CIV-83-1440C. The Olin case involves a landfill on land located at the border between the City of Niagara Falls and the Town of Niagara. A settlement agreement was filed on March 28, 1985. The federal government estimates that there are 140 potentially hazardous waste sites within three miles of the Niagara River.

3

It is not clear whether this nuisance claim was intended as a federal common law claim, or a claim under state common law. It has been clear since the Supreme Court's decision in Milwaukee v. Illinois, 451 U.S. 304 (1981), that federal common law claims are preempted by statute. Only state law claims of this sort are actionable.

4

See, 28 C.F.R. §50.7 (1983).

5

Special provisions apply to the development of RRT proposals. See, infra, p.20.

6

This means that the wells will penetrate 125 feet of bedrock, the thickness of the Lockport Dolomite.

7

The portion of the Agreement providing that Hooker need not survey the bedrock underneath the River by underwater wells is viewed by Ontario as an indication that the Agreement is inadequate. See pp.41-43, infra.

8

In all, Dr. Pinder estimates that he has published 100 pieces on topics pertinent to the subject matter of his hearing testimony. Tr. III-A, p.17.

9

Hooker would not be required to replace the concrete liner of the Emerald Channel tunnel. Hooker is required to replace the liner of the 1937 East Branch tunnel. Compare Agreement, Addendum I ¶E(11)(k) with Addendum I ¶E(9), (10); see also, Tr. II-A, p.16.

10

If S-Area/Buffalo Avenue plant chemicals entered the 1953 tunnel by means other than through the bedrock, Hooker must still correct that condition. Agreement, Addendum I ¶E(11)(f), p. I-58.

11

The comparative monitoring does not involve taking comparative samples from the East Branch. This is because the 1937 section of the intake system will definitely be rebuilt completely. Thus, if shoreshaft water is of inadequate quality compared to river water, the parties assume that this is due to problems in the Emerald Channel intake system. Testimony of Walter K. Morris, Tr. II-A, p.35.

12

The five indicators are hexachlorobutadiene, 2, 4, 5-trichlorophenol, trichlorobenzenes, tetrachlorobenzenes, and hexachlorobenzene.

13

Hooker's expert witness explained that this assumption is faulty. There are manmade conduits through which migration could have occurred. The shoreshaft and bedrock tunnels were described as "preferential pathways" for NAPL migration. Thus, the presence of NAPL there does not necessarily reflect a propensity for NAPL flow through the bedrock. Tr. III-B, pp.43-44.

14

42 U.S.C. §9601(23) provides:

"remove" or "removal" means the cleanup or removal of released hazardous substances from the environment, such actions as may be necessary [sic] taken in the event of the threat of release of hazardous substances into the environment, such actions as may be necessary to

monitor, assess, and evaluate the release or threat of release of hazardous substances, the disposal of removed material, or the taking of such other actions as may be necessary to prevent, minimize, or mitigate damage to the public health or welfare or to the environment, which may otherwise result from a release or threat of release. The term includes, in addition, without being limited to, security fencing or other measures to limit access, provision of alternative water supplies, temporary evacuation and housing of threatened individuals not otherwise provided for, action taken under section 9604(b) of this title, and any emergency assistance which may be provided under the Disaster Relief Act of 1974 [42 U.S.C.A. § 5121 et seq.].

It should be noted that this case does not contain a CERCLA claim. The court's discussion on this point is solely for the purpose of dispelling the Province's notion that the remedy in this case is inconsistent with an important environmental statute.

42 U.S.C. §9601(24) provides, in part, as follows:

"remedy" or "remedial action" means those actions consistent with permanent remedy taken instead of or in addition to removal actions in the event of a release or threatened release of a hazardous substance into the environment, to prevent or minimize the release of hazardous substances so that they do not migrate to cause substantial danger to present or future public health or welfare or the environment. The term includes, but is not limited to, such actions at the location of the release as storage, confinement, perimeter protection using dikes, trenches,

or ditches, clay cover, neutralization, cleanup of released hazardous substances or contaminated materials, recycling or reuse, diversion, destruction, segregation of reactive wastes, dredging or excavations, repair or replacement of leaking containers, collection of leachate and runoff, onsite treatment or incineration, provision of alternative water supplies, and any monitoring reasonably required to assure that such actions protect the public health and welfare of the environment. The term includes the costs of permanent relocation of residents and businesses and community facilities where the President determines that, alone or in combination with other measures, such relocation is more cost-effective than and environmentally preferable to the transportation, storage, treatment, destruction, or secure disposition offsite of hazardous substances, or may otherwise be necessary to protect the public health or welfare.

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For example, on October 14, 1983, intervenors in the Hyde Park case obtained an order requiring Hooker to extend offers to purchase homes near the Hyde Park Landfill. In August of 1984, the views of the same intervenors were considered when Hooker, EPA, and the State sought the court's approval of a plan for the temporary storage of NAPL.