UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II

DATE: JUL 27 [illegible]

SUBJECT: Record of Decision for the Volney Landfill Site

FROM: Stephen D. Luftig, Acting Director
Emergency and Remedial Response Division

TO: Christopher J. Daggett
Regional Administrator

Attached, please find the Volney Landfill site Record of Decision (ROD) prepared by my staff.

The Volney Landfill site, which is located in the Town of Volney, Oswego County, New York, is a fifty-five acre, unlined municipal landfill, where partial closure operations were completed in the fall of 1985 by the current owner, Oswego County.

From 1974 to 1975, allegedly 8,000 drums from the Pollution Abatement Services (PAS) site were approved for burial at the Volney site. Although the drums were believed to be empty, approximately 50 to 200 of these drums allegedly contained unidentified liquid wastes. While contaminants, including benzene, vinyl chloride and arsenic, have been detected in monitoring wells around the site perimeter, these contaminants have not been detected in nearby residential wells at this time.

This ROD reflects the recommendations of the Emergency and Remedial Response Division to address source control measures for the site. Upon completion of a contamination pathways remedial investigation/feasibility study (RI/FS) to further define the extent of contamination in the shallow and bedrock groundwater at the site and the potential contamination of the downgradient stream/wetland ecosystem, a separate ROD will be prepared.

Our recommendations were developed based upon the Administrative Record for this site, which includes an RI/FS prepared by URS Company, Inc., New York State Department of Environmental Conservation's consultant, and a health assessment prepared by the Agency for Toxic Substances and Disease Registry.

The source control remedial action that we are recommending for this site includes supplemental capping of the landfill side slopes in accordance with RCRA 40 CFR § 264.310 (the landfill top has been previously capped with a membrane liner); the installation of a gravel-filled leachate collection drain with an accompanying soil-bentonite slurry wall around the northern and southwestern portions of the landfill; and the treatment of the contaminated leachate in either an on-site or off-site treatment facility. A determination as to the specific treatment method will be made upon completion of treatability studies performed during the remedial design.

The capital and present worth costs for the recommended remedy are estimated to be $12,754,000 and $13,636,000, respectively.

The remedial action will be reviewed by EPA or NYSDEC at least once every 5 years as per SARA § 121 (c) requirements, to assure that human health and the environment are being protected.

The State of New York has been consulted, and agrees that the recommended alternative is the most appropriate source control measure for the Volney Landfill site.

The recommended actions, I believe, are consistent with the goals and objectives of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 (CERCLA), and the National Contingency Plan, to provide adequate protection of human health and the environment. This remedy satisfies all applicable or relevant and appropriate requirements for this operable unit.

We intend to send notice to the Potential Responsible Parties in accordance with the Special Notice Procedures outlined in § 122 (e) of CERCLA, after signature of the ROD.

This is a publicly owned and operated site, therefore, the State of New York's cost share associated with this project is 50 percent.

Operation and maintenance requirements (primarily for the treatment of leachate, groundwater monitoring and cap maintenance) are eligible for Superfund monies for a period of up to one year.

Should you have any questions concerning the ROD, do not hesitate to contact me.

Attachment

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Volney Landfill site, Town of Volney, Oswego County, New York

STATEMENT OF PURPOSE

This decision document represents the selected remedial action for the Volney Landfill site, developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986, and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan, 40 C.F.R. Part 300, November 20, 1985.

STATEMENT OF BASIS

This decision is based upon the administrative record for the Volney Landfill site. The attached index identifies the items which comprise the administrative record upon which the selection of a remedial action is based.

DESCRIPTION OF SELECTED REMEDY (Source Control Operable Unit)

- Supplemental capping of the landfill side slopes in accordance with the Resource, Conservation and Recovery Act 40 CFR Section 264.310 requirement of $1x10^{-7}$ cm/sec permeability for final covers at hazardous waste sites.

- Installation of a leachate collection system consisting of a perimeter gravel-filled leachate collection drain and soil-bentonite slurry wall around the northern and southwestern sections of the landfill, with accompanying collection wells and force mains from the two drain segments.

- Treatment of the contaminated leachate in an on-site treatment plant or transport to an off-site facility for treatment. The specific treatment method will be determined upon completion of the treatability studies performed during the remedial design.

- Operation and maintenance requirements, primarily for treatment of leachate, groundwater monitoring and cap maintenance are required, and are eligible for Superfund monies for a period of up to one year.

- A review of the recommended containment remedial action no less often than each 5 years after the initiation of the proposed remedy, to assure that continued protection to human health and the environment is being provided.

- This Record of Decision addresses only source control measures for the Volney Landfill site. An additional operable unit remedial investigation/feasibility study for the contamination pathways will be conducted which will define the extent of contamination in the shallow and bedrock groundwater and will assess the potential contamination of the stream/wetland ecosystems downgradient from the site. If additional remedial actions are determined to be necessary, a Record of Decision will be prepared for approval of future remedial action.

DECLARATIONS

The selected remedy is protective of human health and the environment, attains federal and state requirements that are applicable or relevant and appropriate for this source control operable unit and is cost-effective. The statutory preference for treatment is not satisfied because treatment was found to be impracticable. This determination is made based on the volume of waste material at the site (e.g., four million cubic yards) and the fact that no known "hot spots" of hazardous materials have been identified at the landfill.

The action will require future operation and maintenance activities to ensure the continued effectiveness of the remedy. These activities will be considered part of the approved action and eligible for Superfund monies for a period of up to one year.

The State of New York has been consulted with and agrees with the approved remedy (see attached).

I have also determined that the action being taken is appropriate when balanced against the availability of Superfund monies for use at other sites.

Date

Christopher J. Daggett
Regional Administrator

SUMMARY OF REMEDIAL ALTERNATIVE SELECTION

VOLNEY LANDFILL SITE

NEW YORK

United States Environmental Protection Agency
Region 2
New York

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Volney Landfill Site
New York

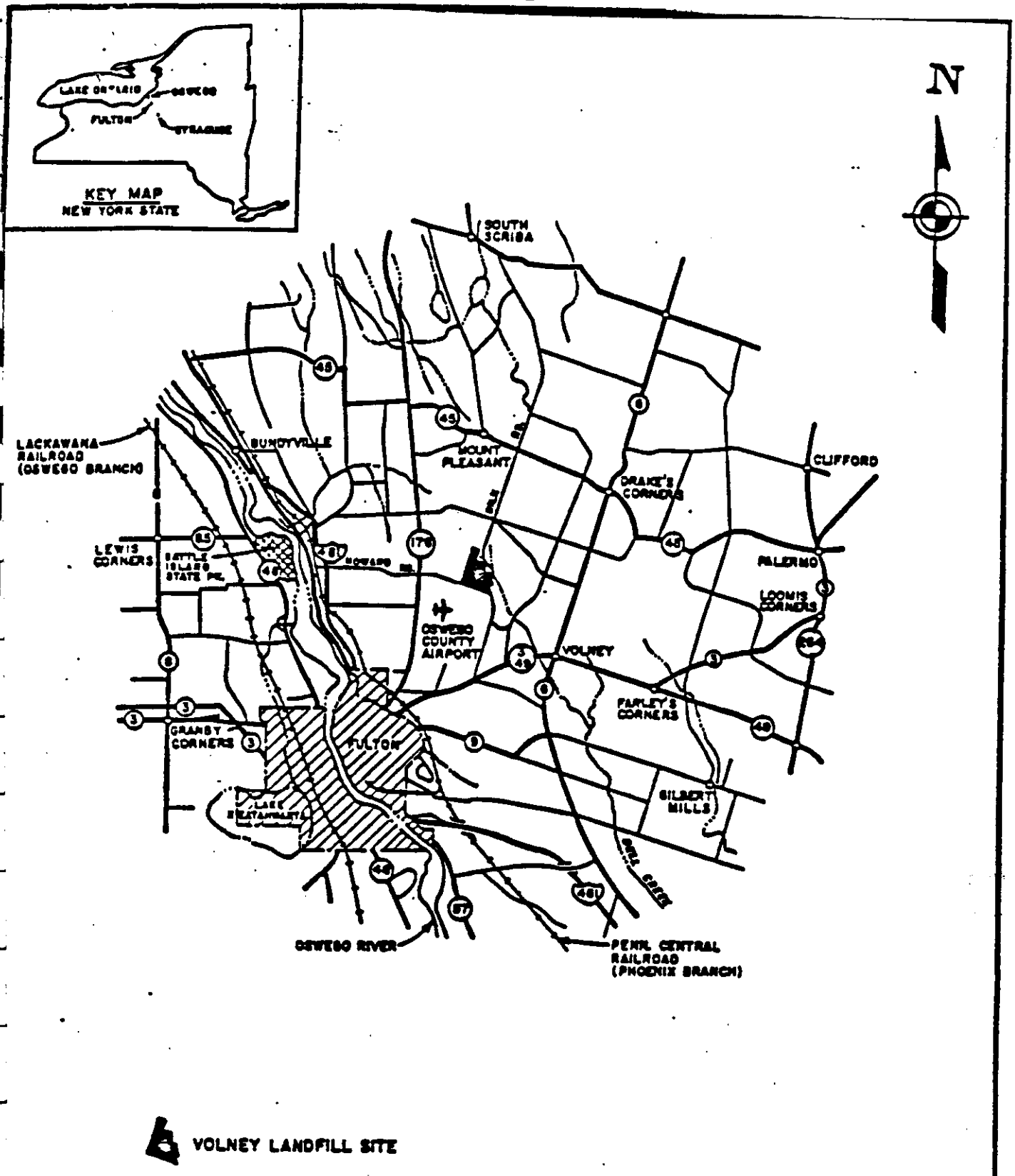
SITE LOCATION AND DESCRIPTION

This summary addresses the site proper operable unit, which involves addressing the source of contamination to prevent further potential contaminant migration from the site, and to eliminate the direct contact threat posed by the site. A subsequent operable unit remedial investigation/feasibility study (RI/FS) will be conducted to address the contamination pathways. This study will involve more accurate definition of the extent of contamination in the shallow and bedrock groundwater at the site and an environmental assessment of the stream/wetland ecosystems downgradient from the site.

The Volney Landfill site was placed on the National Priorities List of known or threatened releases in October 1984. The site is located in a rural area of the Town of Volney, in Oswego County, New York, as shown on Figure 1. This location is approximately 2 miles northeast of the City of Fulton, 25 miles northwest of the City of Syracuse and 10 miles southeast of Lake Ontario.

The site consists of 85 acres, of which 55 acres are an inactive, unlined landfill on which closure operations were completed by Oswego County in the fall of 1985. The closure operations included an impermeable membrane cap on the landfill top, lodgement till cover on the side slopes, surface water drainage controls, landfill gas control and recovery, and leachate manangement. The leachate management consists of a leachate collection drain in the central and northern portions of the landfill that connect to two sumps. Both sumps discharge to the leachate collection tank located on the east side of the site, as indicated on Figure 2. The tank has a design capacity of 300,000 gallons and an overflow capacity of 374,000 gallons.

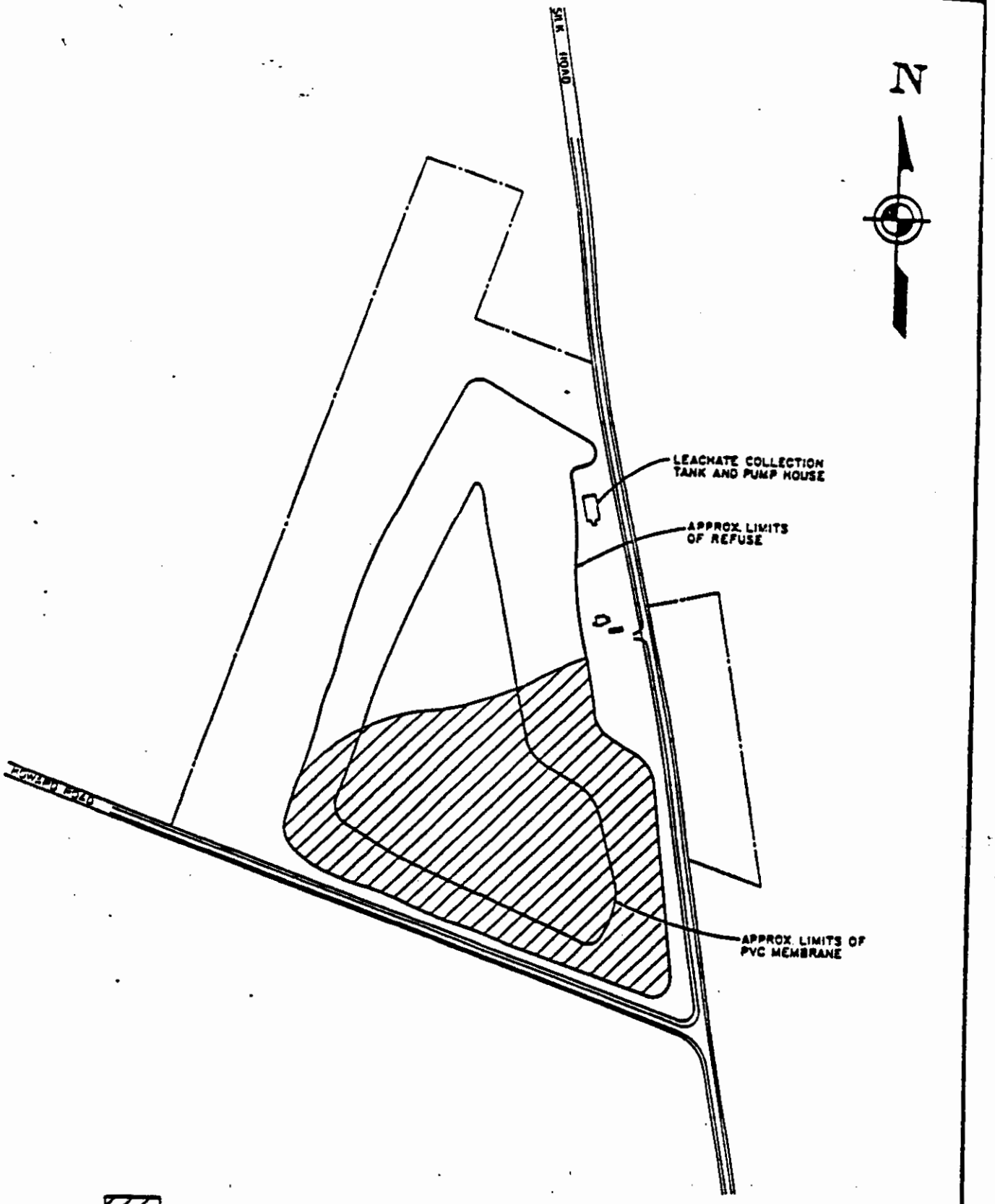
Most of the waste materials disposed of in the landfill consisted of typical residential, commercial, institutional and light industrial waste. However, disposal of approximately 8,000 drums from the Pollution Abatement Services site was permitted. These drums were to contain only residue coatings on the inside of each drum. Allegedly, 50 to 200 of these drums contained unidentified liquid waste. The condition of these alleged drums is unknown, as is their location within the landfill.



URS Company, Inc. CONSULTING ENGINEERS NEW YORK NEW JERSEY

SITE LOCATION MAP

FIGURE 1



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SITE LAYOUT MAP

FIGURE 2

The average depth of fill of the unlined Volney Landfill is estimated to be approximately 45 feet, with a maximum depth of 60 feet in the northern portion of the landfill. The total volume of waste materials buried at the landfill is estimated from the overall dimensions of the site and depth of fill to be approximately 4 million cubic yards. A minimum 5 foot separation between waste materials and the water table was reportedly maintained in the northern (newer) portion of the site. Operations in the southern (older) portion of the landfill, prior to implementation of New York State Part 360 regulations, required only a 3 foot separation; although in general, at least a 5 foot separation was maintained. The landfill has a relatively flat top and moderately steep side slopes of between 15 to 25 percent. It rises approximately 50 feet above the surrounding terrain and forms a locally prominent topographic feature. The site is fenced, with access gates on Silk and Howard Roads.

Woodlands, and farmlands are the principal land use in the vicinity of the Volney Landfill. The zoning of the area is residential with homes sparsely located in the area. A trailer park is located approximately 1,000 feet north of the site on Silk Road and a few houses are located within 100 feet of the site boundaries. In the RI analysis, 25 single-family residences utilizing individual wells have been indentified as potential receptors of groundwater from the landfill. However, no private wells were found to exceed state or federal drinking water standards. The closest population center is the City of Fulton, which is located approximately 2 miles to the southwest and has a 1980 census population of 13,312.

The Oswego County Airport is situated approximately 1000 feet southwest of the site. Also located near the southwest corner of the landfill is a Niagara Mohawk Power Corporation facility on Howard Road which is a base for transmissionline construction and maintenance crews. Numerous inactive sand and gravel pits are located in the area, including locations south and east of the site. Northern Readymix, which is a major producer of aggregate materials and concrete products, is located on Silk Road approximately one mile south of the site.

Surface drainage in the area is generally by low-gradient streams. The site area is drained by Bell Creek and tributaries of Black Creek which eventually drain into the Oswego River, a major regional river that empties into Lake Ontario at Oswego, New York. The landfill was constructed on a pre-existing topographic high which forms the divide between the headwaters of the north-flowing Black Creek to the west and the south-flowing Bell Creek drainage to the east of the site. For most of the site area, surface drainage is not well developed and the location of the drainage divide is approximate. A small portion of the 100-year storm flood for Bell Creek crosses the site boundary in the extreme northeast corner but this parcel is beyond the limits of previous landfilling operations.

The geomorphic setting of the region in which the site is located consists of gently rolling hills and intervening flatlands. The site is underlain by a thick section of unconsolidated deposits, primarily of glacial origin, overlying bedrock. The bedrock unit, occuring at depths ranging from about 30 to 100 feet below ground surface, consists of reddish-brown sandstones, siltstones and shales. A basal layer of compact lodgement till, varying in thickness from about 16 to 73 feet, appears to be laterally continuous over bedrock throughout the site. This lodgement till unit is a compact, relatively impermeable layer with an average hydraulic conductivity of approximately 6.7×10^{-5} cm/sec. Glaciolacustrine deposits occur as layers of fine sand and silt, up to 28 feet thick, directly overlying lodgement till in the topographic basins between drumlins. Reworked sand and gravel, ranging from 4 to 25 feet thick occurs as a surficial mantle which overlies the lodgement till and glaciolaustrine deposits. This reworked sand and gravel unit was excavated to till prior to the placement or refuse.

Groundwater flow systems at the site were evaluated in both horizontal and vertical directions. The shallow, unconfined aquifer, comprised of reworked sand and gravel overlying lodgement till, has a water table configuration which is closely related to topography, therefore groundwater flows radially outward from the landfill. A large portion of the shallow groundwater draining from the landfill is directed eastward under Silk Road to Bell Creek. The southwest corner of the landfill drains to the southwest, into the Black Creek tributaries.

Bedrock aquifers in the region of the site generally transmit water through secondary porosity features, such as joints and fractures. Available data from the limited number of bedrock wells indicate that the bedrock surface has a generally low relief with linear trends similar to the regional surficial land forms. Though inconclusive, this indicates that groundwater flow in the bedrock generally trends to the easterly direction with upward and downward gradients due to joints and fractures.

Vertical hydraulic gradients at the site were found to be highly variable. This is probably the result of groundwater mounding at the site, which is induced by the relatively impermeable lodgement till unit underlying more conductive overburden strata. This will tend to produce relatively short-term, drainage-related fluctuations in water table elevations and vertical gradients. In addition, the recent site capping is producing a long-term change in these vertical flow patterns.

SITE HISTORY

Operations at the Volney Landfill, also known as the Silk Road or the Oswego Valley Sanitary Landfill, were initiated in 1969 in a former sand and gravel pit located in the southeast corner of the site, and thereafter progressed generally northward. From 1969 until 1974, the landfill was operated by the Oswego Valley Solid Refuse Disposal District Board. The Board consisted of the City of Fulton, the Village of Phoenix, and the Towns of Granby, Schroeppel and Volney. In early 1975, Oswego County purchased the site from the board. Waste disposal operations continued at the landfill until 1983.

Most of the waste materials disposed of in the landfill from 1969 to 1983 consisted of residential, commerical, institutional and light industrial wastes. However, between March 1974 and January 1975, approximately 8,000 drums from Pollution Abatement Services (PAS), a hazardous waste incineration facility located in the City of Oswego, were allegedly buried at the site. The New York State Department of Environmental Conservation (NYSDEC) had approved the landfill for disposal of

discarded drums from PAS containing the residues of chemical sludges, with the exception of phenols or chlorinated compounds. The landfill operator at the time has indicated that 50 to 200 of these drums contained unidentified liquid waste that was incorporated into the everyday fill. The condition of these drums is unknown, as is their location within the landfill.

As the landfill expanded in the mid-1970s to the central and northern parts of its present configuration, a leachate collection system was installed. After the County purchased the site, surficial sand and gravel were removed and the underlying glacial till was graded towards a common collection trench in the central portion of the site and connected to a small sump opposite the maintenance building. In the northern portion, a leachate collection drain was installed by the County in 1982 (as part of a consent order with the NYSDEC), and connected to a second sump. Both these sumps discharge to the leachate collection tank located on the east side of the site.

Several methods have been employed to treat collected leachate from the site. From about 1979 to 1983, leachate collected first from the sumps and then from the collection tank was treated at Armstrong Cork Co. Wastewater Treatment Center in Fulton. The volume of collected leachate was reported to range between 500 and 5,000 gal/day from 1980 to 1982. After the County was informed that Armstrong would no longer accept leachate for treatment, it temporarily utilized the City of Oswego's Westside Sewage Treatment Plant. Leachate was transported to and treated in the Oswego plant during 1984 and 1985. Reported average daily quantities of leachate treated at the plant were 3,550 gal/day and 6,900 gal/day, respectively, for 1984 and 1985. The Fulton Wastewater Treatment Plant has been treating the leachate since 1986; however, the quantities of leachate treated have not been identified.

Waste disposal continued at the Volney Landfill until shortly after the opening of the Bristol Hill Landfill, approximately 2 miles to the southeast of the site, in September 1983. In the fall of 1985, closure operations for the Volney Landfill were completed by Oswego County.

On March 14, 1979, the NYSDEC entered into a consent order with Oswego County after the County contravened NYSDEC's groundwater quality standards in monitoring wells near the site. Pursuant to the consent order, corrective actions to be taken by the County on or before June 15, 1979 involved groundwater monitoring studies, evaluation of leachate and sludge treatment, and the development of a closure plan. The County subsequently developed a closure program for the site which was in compliance with the minimum closure requirements specified in New York State 6 NYCRR Part 360 and the Solid Waste Management Facility Guidelines. The closure program involves a three-tiered approach. Phase I was completed in the fall of 1985 and included a combination soil barrier and PVC membrane cap (1×10^{-7} cm/sec permeability) over the relatively flat top area, a two foot soil cap (1×10^{-5} cm/sec permeability) over relatively steep side slopes, a surface water drainage system, a methane gas control system, a leachate collection and disposal system and a post-closure maintenance program. Phase II and III of the closure program, which involves long-term groundwater monitoring and potential development of remedial actions, respectively, will not be implemented due to the proposed CERCLA action.

CURRENT SITE STATUS

Through a Cooperative Agreement with USEPA, the NYSDEC completed an RI/FS for the Volney Landfill site in May 1987 through its contractor, the URS Company, Inc. Contamination sources, contaminant transport, environmental receptors impacted and suspected risks posed by contaminants are evaluated in the RI/FS. The following is a brief summary of the types and concentrations of contaminants detected at the site.

A variety of hazardous substances were detected in groundwater monitoring well samples around the landfill perimeter. Their appearance is generally erratic from well to well. From the available data generated from the RI, it appears that groundwater contamination by hazardous substances is somewhat greater in the southern (old) portion of the landfill. The compounds detected include 17 volatile compounds, 14 semivolatile compounds and 10 metals. Of these compounds, 8 were found to

be in violation of their enforceable groundwater limits and guidelines. These include vinyl chloride (USEPA Safe Drinking Water Act (SDWA) Maximum Contaminant Level (MCL) is 1 ppb), benzene (USEPA MCL is 5 ppb and NYS 6 NYCRR Part 703.5 Class GA groundwater standard is not detectable), total phenols (NYS 6 NYCRR Part 703.5 Class GA standard is 1 ppb), arsenic, beryllium (USEPA Clean Water Act (CWA) Water Quality Criteria (WQC) is 0 ppb), chloroform (USEPA CWA WQC is 0 ppb), nickel (USEPA CWA WQC is 15.4 ppb), and selenium (USEPA MCL is 10 ppb). The maximum contaminant concentration detected at the site was arsenic at 85 ppb. The Part 703.5 NYS groundwater standard for Class GA (potable water) for arsenic is 25 ppb. The USEPA MCL is 50 ppb for arsenic. Table 1 summarizes the groundwater substances and parameters that exceed standards and guidelines.

Leachate indicator parameters observed in most of the groundwater samples indicate that groundwater contamination by landfill leachate is occuring around the perimeter of the site. Available data also indicate that leachate from the landfill has permeated the lodgement till and has reached bedrock. This analysis is based upon a limited number of bedrock monitoring wells installed and sampled during the RI. A subsequent operable unit RI/FS for the contamination pathways will define the extent of contamination of the shallow and bedrock groundwater.

Because the landfill is unlined and has a leachate collection system only in its newer (northern) section, leachate migration in both horizontal and vertical directions is occuring. Vertical migration, however, is impeded by a relatively impervious (6.7 x 10-5 cm/sec permeability) lodgement till unit underlying the fill.

The shaded area of Figure 3 indicates the potential receptors of contaminated groundwater from the site. This area was estimated by determining that groundwater flow reflects surface topography and by tracing the extreme surface drainage flow paths from the perimeter of the landfill to the nearest

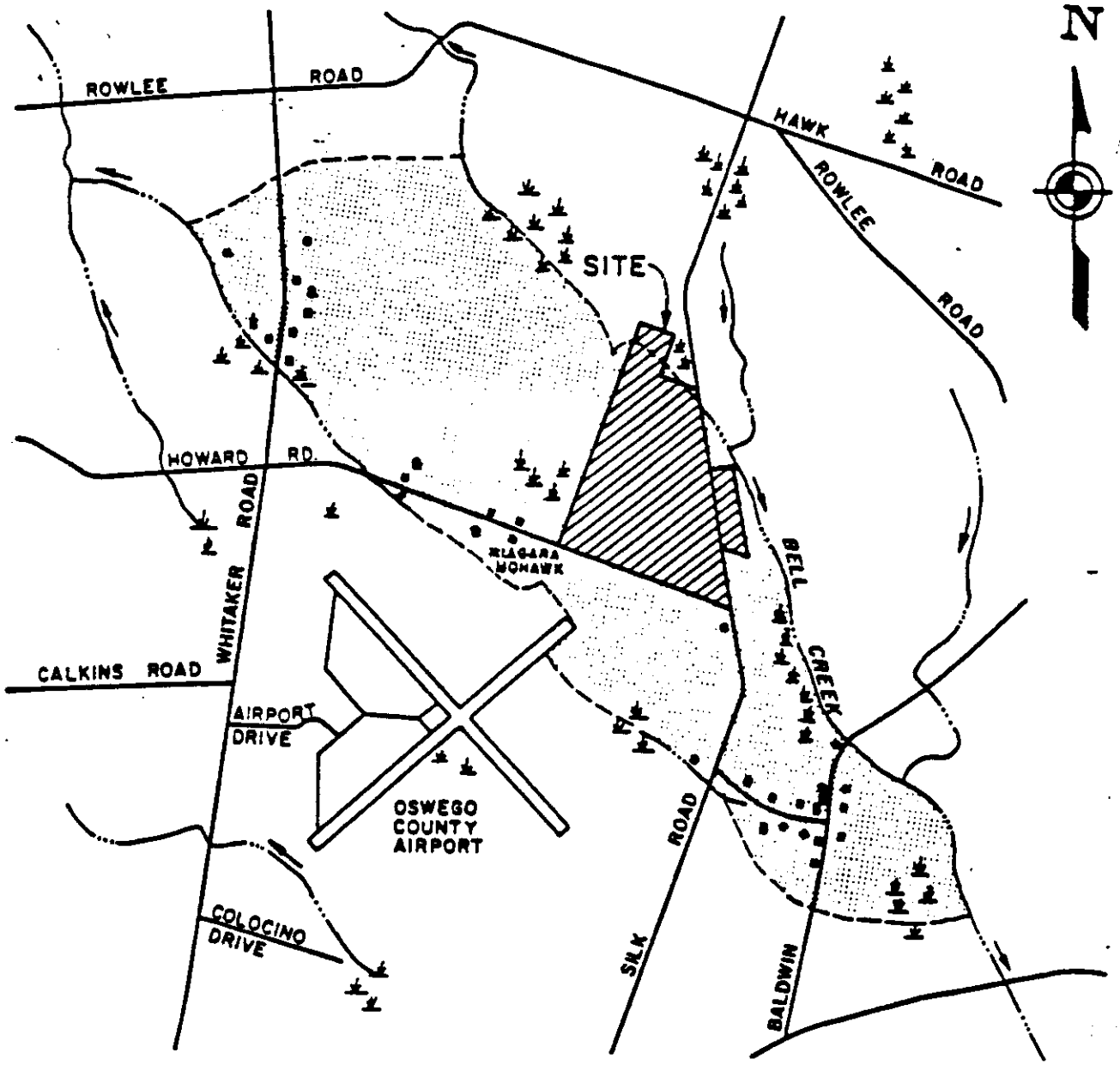
TABLE 1

GROUNDWATER SUBSTANCES AND PARAMETERS
EXCEEDING STANDARDS AND GUIDELINES

Substance	Max Conc. (ug/l)	Exceeded Enforceable Limit		
		Conc. (ug/l)	Source*	No. Samples/ Total Samples
Vinyl Chloride	5.8	1	MCL	1/24
Benzene	3.5	not detectable	703.5	2/24
Arsenic	85	25	703.5	1/20
Selenium	16	10	141.1(MCL)	5/20
Total Phenols	13	1	703.5	8/20
pH (Min)	6.31	6.5	170.4	1/22
TDS	880 mg/l	500 mg/l	170.4	4/18

Substance	Max Conc. (ug/l)	Exceeded Guideline		
		Conc. (ug/l)	Source	No. Samples/ Total Samples
Chloroform	70	0	CWA	1/24
Vinyl Chloride	5.8	0	RMCL	1/24
Benzene	3.5	0	RMCL	2/24
Trichloroethene	3.4	0	RMCL	7/24
Tetrachloroethene	0.62	0	RMCL	1/24
Arsenic	85	0	CWA	5/20
Beryllium	5	0	CWA	7/20
Nickel	75	15.4	CWA	8/20
TDS	880 mg/l	500 mg/l	143.3	4/18

* See Table 2 for explanation of sources



LEGEND

- AREA OF GROUNDWATER POTENTIALLY AFFECTED BY LANDFILL
- STREAM
- RESIDENCE
- MOBILE HOME
- B FARM BUILDING

SCALE
1000 0 1000 FEET

URS Company, Inc. CONSULTING ENGINEERS NEW YORK NEW JERSEY	POTENTIAL GROUNDWATER RECEPTORS	FIGURE 3

perennial streams. All residences within this shaded area are served by individual wells and are therefore potential receptors of groundwater contamination from the landfill. A total of 25 single-family residences (approximately 100 people) are located within the shaded area of Figure 3. A trailer park is located aproximately 1,000 feet north of the site on Silk Road. It is not believed, however, to be a potential receptor from shallow groundwater flow from the site since it is separated hydrogeologically from the site by a stream.

RI surface water samples were collected along Black and Bell Creeks. Analysis of these samples indicates a generally lower incidence of surface water contaminants and at lower concentration levels than observed in groundwater. Total phenols were found to be in violation of its enforceable surface water limits (NYS 6 NYCRR Part 701.19 standard of 1 ppb). The compounds found to be in violation of their USEPA CWA WQC guidlines include chloroform (0 ppb), arsenic (0 ppb), beryllium (0 ppb), lead (50 ppb), thallium (13 ppb) and mercury (0.144 ppb). Arsenic was the most widespread of these contaminants and it was detected at a maximum concentration of 37 ppb. Table 2 summarizes the surface water substances that exceed standards and guidelines.

Leachate indicator parameters (e.g., temperature, alkalinity, COD and TOC) reveal contamination of adjacent surface waters, though in an apparently diluted form as compared with groundwater contamination. The upstream sampling station on a tributary to Bell Creek showed the highest overall concentration of leachate indicators. Thus, it appears that a source of contamination may exist upstream from the landfill. The contamination pathway operable unit RI/FS will more accurately define the extent of contamination in the streams and assess whether the site is a potential source of this contamination.

The impact of surface water contamination adjacent to the Volney Landfill site is lessened considerably by the natural dilution of contaminants within the stream system. This dilution results from a number of processes, including mechanical dispersion and physical/chemical/biological reductions (e.g., due to adsorption, settlement, volatilization, biological decay, etc.)

There is a low probability that several municipal supply well fields located approximately twelve river miles downstream (south) of the site, located adjacent to the Oswego River, will be impacted by surface water contamintion from the site. The rationale is that surface water contamination is already at low levels adjacent to the site and will decrease considerably by natural dilution of contaminants with distance within the stream system, and, therefore, will not impact the municipal water supply.

TABLE 2

SURFACE WATER SUBSTANCES AND
PARAMETERS EXCEEDING STANDARDS AND GUIDELINES

Substance	Max Conc. (ug/l)	Exceeded Enforceable Limit		
		Conc. (ug/l)	Source *	No. Samples/ Total Samples
Total Phenols	16	1.0	701.19	5/7

Substance	Max Conc. (ug/l)	Exceeded Guideline		
		Conc. (ug/l)	Source	No. Samples/ Total Samples
Chloroform	0.48	0	CWA	2/7
Arsenic	37	0	CWA	7/7
Beryllium	5	0	CWA	4/7
Lead	79	50	CWA	1/7
Thallium	20	13	CWA	4/7
Mercury	0.4	.144	CWA	3/7

* 1) Sources for the Enforceable Limits are as follows:
- ° 703.5- 6 NYCRR Water Quality Regulations, Part 703.5- Classes and quality standards for groundwater
- °°170.4- 10 NYCRR Part 170.4- Sources of Water Supply- Standards of raw water quality
- °°141.11- 40 CFR Part 141 EPA National Primary Drinking Water Regulations (NPDWR) Subpart B, Maximum contaminant levels (MCLs) for inorganic chemicals
- °°MCL- 40 CFR Part 141 EPA NPDWR, MCLs for organic chemicals proposed in Federal Register (11/13/85)

2) Sources for the Guidelines are as follows:
- °°CWA- Clean Water Act Water Quality Criteria
- °°RMCL- 40 CFR Part 141 Recommended maximum contaminant levels
- °°143.3- 40 CFR Part 143.3- EPA National Secondary Drinking Water Regulations- Secondary MCLs

During the RI, sediment samples were collected at the same location as the surface water samples, along Black and Bell Creeks. RI analysis performed on these stream sediments generally detected fewer hazardous substances than in groundwater or surface water, though at somewhat higher concentrations. These compounds include 8 volatiles, 6 semivolatiles, 1 polychlorinated biphenyl (PCB) and 11 metals. Both cyanide and the occurance of one PCB compound (Aroclor 1248 at 80 ppb) were detected in the sediment samples. Neither of these compounds however, were detected in groundwater or surface water samples.

There is no spatial trend of sediment contamination within the sediments sampled from the streams. The upstream sediment sample taken during the RI is upstream from the landfill but is also downgradient (hydrogeologically) and down slope (topographically) from the northern end of the landfill. The contamination detected at this location may either be a result of the landfill as a source of contamination or from an upstream or background source.

Due to cold and windy field conditions during the RI, field screening of spilt-spoon soil samples taken from the soil borings along the site perimeter was not feasible. Instead a photoionization detector was used to screen soil samples. Soil samples with ambient vapor readings (less than 1 ppm) were found in shallow wells near the site boundaries just west and north of the limits of the fill. Elevated readings were found in shallow wells located outside the fenced area of the site. These were found to be increasing from slightly elevated (e.g., 15-20 ppm) in the east to moderately elevated (e.g., 20-25 ppm) in the southeast and high (e.g., greater than 30 ppm) in the southwest.

Wells which were within or near the limits of fill showed moderate and high (up to 1090 ppm) vapor readings. Well clusters with upward gradients showed ambient to moderately elevated vapor readings, while well clusters with downward gradients showed high vapor readings.

Based upon the previous discussion concerning the extent of contamination at the site, and the results of the following baseline risk assessment conducted for the site, the primary potential human health impact of the site is through local contamination of groundwater, which is a source of potable water. This impact is identified as potential, because on the basis of an ongoing testing program of residential wells in the site vicinity, there has been no significant contravention of drinking water standards.

From an overall standpoint, the primary potential environmental impacts of the site are upon the stream channels and wetlands located downgradient from it (Figure 4). Based upon the sampling conducted during the RI, the relatively low levels of surface water contamination are not considered to be a significant threat to the wetland and stream environment at this time. However, a more accurate definition of the surface water contamination will be provided following a subsequent RI/FS of the contamination pathways.

The above discussion addresses primarily the lesser impact of contaminated surface water upon the wetland system. It should be noted, however, that contaminated sediments within the stream system pose another, significantly greater, potential risk to the environment. As discussed earlier, contaminant levels in sediments are generally much higher than in surface water, especially among metals (e.g., cyanide). Contaminated sediments which are transported and deposited throughout the stream system intermittently in response to flooding events, may pose a risk to the wetland ecosystems downgradient from the site. An environmental assessment of the stream/wetland ecosystems downgradient from the site will be conducted in a subsequent contamination pathway RI/FS operable unit.

RISK ASSESSMENT

As discussed previously, the primary potential human health impact at the Volney Landfill is the contamination of groundwater, which is used as a local source of water supply. In order to assess the level of risk associated with this groundwater contamination, a baseline public health evaluation was conducted. This evaluation provides a qualitative estimate of risk levels under existing conditions, in the absence of remedial action. This in turn, can be used as a component factor in determining whether remedial action at the site is warranted. The risk assessment was developed as follows: identify contaminants of concern; describe pathways of exposure associated with site contaminants; estimate levels of exposure and determine populations exposed and characterize current and potential risks to human health and the environment.

Contaminants of Concern

Two separate risk assessments were performed: one utilizing data collected from residential wells and the other using data collected from monitoring wells. A common set of indicator chemicals were selected for both of these separate risk assessments.

Indicator chemicals were selected based upon the following criteria: the chemical must have been detected in at least one valid analysis since 1984; the chemical must have known toxic or carcinogenic effects and there must be quantitative data available for toxicity or carcinogenicity for the chemical.

A variety of chemical compounds were found at the site, however, many were eliminated as possible indicator chemicals based on the above factors. Three compounds detected in residential wells (toluene, manganese and zinc) and 18 compounds detected in monitoring wells (9 volatiles, 9 metals) were selected as indicator chemicals. Contaminants detected in monitoring well samples which were considered as indicator chemicals and which are known or suspected carcinogens include vinyl chloride, benzene and arsenic.

Exposure Pathways

Due to the previous waste disposal operations and the observed occurrence and pattern of groundwater contamination at the site, it is believed that the Volney Landfill is the principal source of most, if not all, of the indicator chemicals selected above for the risk assessment.

Based upon the results of the RI/FS, it has been determined that groundwater contamination is the primary human health risk at the Volney Landfill. The groundwater contamination from the site travels primarily in a horizontal and outward radial direction, but at the same time it moves vertically through the lodgement till toward bedrock. Residential wells in both overburden (sand and gravel) and bedrock units are potentially affected by this contamination, though the impact upon overburden wells is considerably more direct.

It is currently estimated that 25 residential wells (approximately 100 people) may be eventually exposed to the contaminants migrating from the site. Of the eight residential wells from which analytical data is used in this assessment, four are bedrock wells and four are screened in overburden deposits. The major exposure pathway and subsequent health risk is the ingestion of contaminated drinking water. Although there may be some risk of exposure via inhalation mainly through showering, this risk is considered much smaller than by ingestion.

The only two compounds detected in monitoring wells at concentrations exceeding their Safe Drinking Water Act Maximum Contaminant Level (MCL) values of 10 ppb and 1 ppb, respectively, were selenium and vinyl chloride. These exceedances were based on maximum concentrations. Neither compounds' mean concentration exceeded its MCL value. Maximum detected concentrations of arsenic, beryllium, nickel, selenium, benzene and vinyl chloride exceeded the USEPA Ambient Water Quality Criteria (WQC), and mean concentrations of arsenic and beryllium exceeded the WQC in monitoring wells. However, neither MCLs or WQCs were exceeded in any of the residential wells utilized in this health risk assessment.

Risk Characterizations

Available analytical data from residential wells in the vicinity of the landfill does not indicate any risk associated with toxic or carcinogenic chemicals. However, arsenic, the carcinogenic chemical of greatest concern in the monitoring well data, was not analyzed in the residential well samples utilized in this assessment. Arsenic will be one of the parameters analyzed for during the proposed long-term groundwater monitoring program.

Monitoring well data indicate that there is some potential for health risk associated with toxic chemicals (manganese, MEK, and phenol), but a considerably larger risk related to carcinogenic chemicals (benzene, vinyl chloride, and arsenic). However, any risk derived from this monitoring well data assumes that groundwater of the quality observed in the monitoring wells reaches the residential wells and is subsequently ingested.

Environmental Impacts

Potential environmental impacts of the Volney Landfill are limited in both type and degree. Since the landfill top has been capped and the entire site is fenced, the possibility of direct contact with waste materials is minimal. However, there is a direct contact threat associated with the soil capped side slopes as well as side slope leachate breakout. In addition, subsurface gas migration away from the site, with its corresponding potential impact upon resident flora and fauna, will presumably be prevented by the gas collection and venting system which was previously installed by Oswego County with the top cap.

The NYSDEC-designated wetlands located downstream (Figure 4) from the site have been designated primarily upon the basis of resident vegetation. These wetlands provide a haven for fish, waterfowl and birds migrating through the area. Although the landfill and surrounding wetlands are not known to be the habitat of any endangered or threatened species, they are within the migrating range of the Osprey (fish hawk), a threatened species protected at Three Rivers State Wildlife Management Area, located approximately 10 miles south of the site. The low levels of surface water contamination observed during the RI/FS are not considered a significant threat to the wetland ecosystem. Contaminated stream sediments which are transported and deposited throughout the system as a result of flooding events, however, may pose a significantly greater risk to the wetland ecosystems downgradient from the site.

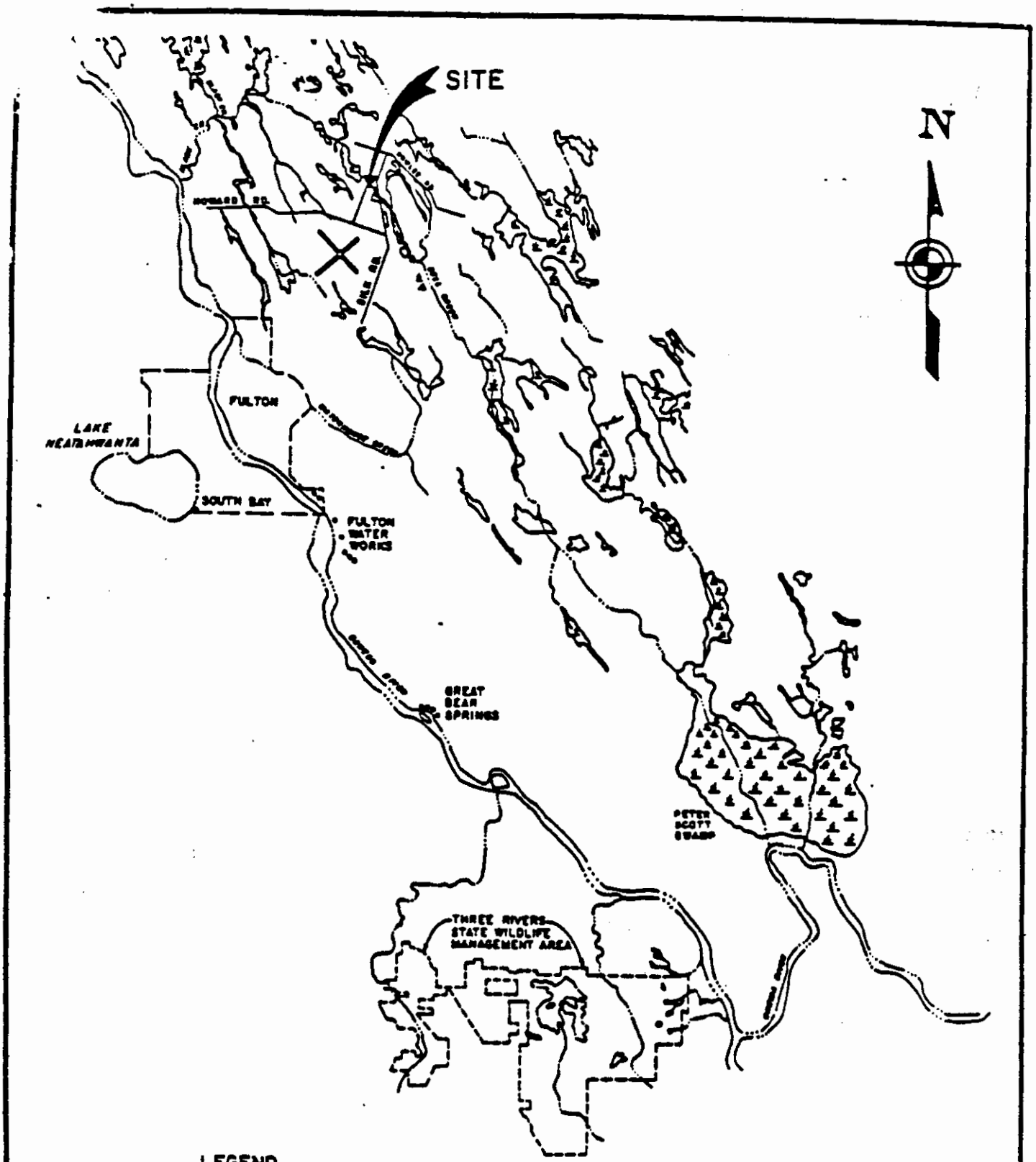
At the request of the USEPA, the Agency for Toxic Substances and Disease Registry conducted a health assessment in July 1987 for the Volney site. The assessment concluded that groundwater flow patterns at the site indicate that the spread of the contaminated groundwater threatens the quality of local groundwater supplies unless appropriate action is taken to contain the spread of the contaminated groundwater.

ALTERNATIVES EVALUATION

The remedial alternatives for the Volney Landfill site were developed and evaluated using the Comprehensive Environmental, Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 (CERCLA), the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR §300.68, and the "Guidance on Feasibility Studies Under CERCLA", as guidance.

The major objective of the FS is to evaluate remedial alternatives using a cost-effective approach consistent with the goals and objectives of CERCLA. According to Section 121 of CERCLA, the recommended remedial alternative should protect human health and the environment, should be cost-effective, and should utilize permanent solutions and alternative treatment or resource recovery technologies to the maximum extent practicable. The proposed remedy must also attain applicable or relevant and appropriate federal and state public health and environmental requirements (ARARs) that have been identified for the site. Section 300.68(e) of the NCP outlines procedures and criteria which were used in selecting the most cost-effective alternative.

A five step process was developed and used to meet the FS objectives. The following is a summary of that process.



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POTENTIAL SURFACE WATER RECEPTORS

FIGURE 4

The first step is to evaluate human health and environmental effects associated with releases and threatened releases of hazardous substances from the site. Criteria to be considered are outlined in Section 300.68(e) of the NCP and include such factors as actual or potential direct contact with hazardous material, degree of contamination of drinking water, and extent of isolation and/or migration of the contaminants.

The next step is to develop a range of potential available remedial technologies that could be used to remediate the site. Remedial technologies in which treatment which permanently and significantly reduces the toxicity, mobility or volume of the hazardous substances as a principal element, are to be preferred over remedial technologies not involving such treatment. These technologies are initially screened on a technical basis. Based on the screening, a list of individual remedial technologies appropriate to site conditions and consistent with the remedial action objectives is developed.

The site-appropriate remedial technologies are then combined into a number of preliminary remedial alternatives. The basis for the various combinations are: the technical and logical interrelationship between separate technologies; Section 300.68(f) of the NCP requirements regarding the general categories of alternatives which must be considered and CERCLA Section 121 provisions regarding the preference for remedial actions that utilize permanent solutions and alternative treatment or resource recovery technologies. USEPA is in the process of revising the NCP to reflect these new provisions added by CERCLA. USEPAs "Interim Guidance on Superfund Selection of Remedy" memorandum, issued December 24, 1986, is intended to aid the Agency in the selection of remedial actions pending USEPAs upcoming revisions of the NCP. This summary reflects that guidance. USEPAs interim guidance requires analysis of alternatives involving: 1) treatment options; 2) containment of waste option with little or no treatment, but providing protection of human health and the environment primarily by preventing exposure or reducing the mobility of the waste and 3) the no-action alternative. These three categories of alternatives must be carried through the detailed evaluation process, and should not be eliminated during previous screening processes.

The fourth step in the process is to provide an initial screening of these alternatives as delineated in Section 300.68(g) of the NCP. The three broad criteria that should be utilized in the screening are: the relative effectiveness in minimizing threats; the engineering feasibility of the alternatives and

the cost of implementing the remedial action. Treatment options, containment options and the no-action alternative should be carried through this step. This general screening is intended primarily to reduce the number remedial alternatives which will subsequently be evaluated in detail.

The final step as outlined in Section 300.68(h) of the NCP is to conduct a detailed analysis of the limited number of alternatives that remain after the initial screening. A treatment, containment and no-action alternative should be included in this analysis. For each alternative, the following factors, as appropriate, are to be considered:

- An evaluation in terms of engineering implementation, reliability, and constructibility;
- An assessment of the extent to which the alternative is expected to effectively prevent, mitigate, or minimize threats to, and provide adequate protection of human health and the environment. This includes an evaluation of the extent to whch the alternative attains or exceeds ARARs for the site. Where the analysis determined that federal and state human health and environmental requirements are not applicable or relevant and appropriate, the analysis, as appropriate, evaluated the risks of the various exposure levels projected or remaining after implementation of the alternative under consideration;
- An analysis of whether recycle/reuse, waste minimization, waste biodegration, or destruction, or other advanced, innovative, or alternative technologies is appropriate to reliably minimize present or future threats to human health and the environment;
- An analysis of any adverse environmental impacts and methods for mitigating these impacts, and costs of mitigation;
- A detailed cost estimation, includig operation and maintenance costs, and distribution of costs over time. This includes a cost comparison of alternatives within each category.

DEVELOPMENT OF ALTERNATIVES AND INITIAL SCREENING

Source control remedial responses for the Volney Landfill site will address the site proper (fenced area) contamination. A further definition of the extent of contamination in the shallow and bedrock groundwater and the potential contamination of the stream/wetland ecosystems downgradient from the site will be assessed in a subsequent contamination pathways RI/FS.

The objective of the proposed source control remedial action is designed to prevent further contaminant migration from the site and thus minimizing the threat to human health and the environment. Criteria established to obtain this objective are:

- Reduce the potential for human/animal direct contact with site waste;
- Minimize the migration of landfill leachate through surface and groundwater; and
- Minimize the potential for precipitation/infiltration contact with site wastes.

Considering the potential receptors of contamination from the Volney Landfill, the conformance with regulatory limits (ARARs) for surface water and groundwater contaminants, and the baseline risk assessment, it is believed that the primary potential human health impact of the site is through local contamination of groundwater, which is a source of potable water for area residents.

Potential environmental impacts resulting from surface water contamination of the site are minimal, though contaminated sediments pose a significant risk to the wetlands downgradient from the site. A more accurate definition of those impacts and potential contamination of the shallow and bedrock aquifer at the site will be addressed in a subsequent operable unit.

For the Volney Landfill, the applicability of certain remedial technologies is limited from a technical standpoint by site conditions and by the site-specific objectives for remedial action. Due to the physical size and volume of the waste material at the site (e.g., four million cubic yards) and the fact that no known "hot spots" of hazardous materials have been identified at the landfill, the development of treatment alternatives to satisfy the surface and groundwater ARARs for this site would be inappropriate. ARARs other than surface and groundwater will be identified during the alternatives evaluation, and they will be met to the extent practical. The technologies appropriate for this site will address containment of the source of contamination. However, an alternative technology addressing treatment of the waste will be carried through the entire alternative evaluation process. In addition, the no-action alternative and non-treatment alternative categories will also undergo the same evaluation.

Source control technologies that are not considered appropriate for utilization at the Volney Landfill and a brief discussion of the reasons for their exclusion are listed in Table 3.

Table 4 lists and briefly describes the technically appropriate remedial technologies for the Volney Landfill. These technologies were accepted on the basis that they are compatible with the specific site conditions and the remedial action objectives for this operable unit. These technologies were then combined into source control alternatives. As a result, twelve remedial action alternatives, as specified in Table 5, were developed for evaluation.

The twelve remedial alternatives have been subjected to an initial screening consistent with 40 CFR Section 300.68(g)(1),(2) and (3) of the NCP to narrow the list of potential remedial actions for futher detailed analysis. This screening provided the following results:

- On-site leachate treatment was estimated to cost approximately $0.065 per gallon, versus off-site treatment, whose costs are highly variable but are estimated at approximately $0.079 per gallon. The variable costs for treating leachate off-site at a private or a publicly-owned wastewater treatment facility (POTW) depends not only on the chemical nature of the leachate, but also the size, design and operating conditions of the plant, and the regulatory status of the plant pertaining to acceptance of extraneous waste streams. Both technologies will be carried forward as alternative leachate treatment methods, since without treatability studies, it is impossible to conclusively establish the feasibility of any on-site leachate treatment process or alternately, to rule out the need for off-site treatment of leachate.

- A slurry wall keyed into the relatively impermeable lodgement till was determined to be a cost-effective measure for preventing entry of clean water into a perimeter leachate collection drain, and will be incorporated as part of all alternatives which include leachate collection. The slurry wall would be installed around the northern and southwestern portions of the site perimeter.

Table 3
Inappropriate Remedial Technologies

- In-situ waste treatment - Impractical due to the unknown locations of hazardous wastes within the very large landfill volume.

- Encapsulation of wastes - Better suited for smaller waste quantities and a larger site area that could physically accommodate excavation and relocation for encapsulation. The Volney Landfill site contains a very large quantity of fill material (approximately 4 million cubic yards) and insufficient available site area to consider encapsulation.

- Stormwater diversion - The site is located on a topographic high, therefore, stormwater diversion is unneccessary. The minor encroachment of the 100-year flood boundary for Bell Creek in the extreme northeast corner of the site is beyond the limits of previous landfilling activities and beyond the area of potential remedial measures.

- Supplementary capping of landfill top - The landfill top surface has recently been capped with a membrane liner underlying a 2 foot compacted soil barrier. Based on the infiltration analysis in the FS, the average annual infiltration through the top surface is calculated to be 0.62 inches/year, as compared with 5.91 inches/year through the side slope surface. Therefore, supplemental capping of the landfill top would not provide a significant reduction in the quantity of leachate generated.

- Gas migration controls - Unnecessary due to the recent design and construction of a gas collection/venting system at the site.

- Bottom sealing - Bottom sealing of the landfill, by block displacement or other method, is inappropriate because of the large size of the site and the lack of geologic data from immediately under the refuse.

- Off-site incineration - Both on- and off-site incineration provide the same degree of remediation. However, the environmental impacts associated with transporting 2 million cubic yards of waste (from the southern portion of the landfill) to an off-site facility (e.g., increased truck traffic, increased risk to area residents) make this alternative inappropriate.

Table 4
Appropriate Remedial Technologies

- Excavation and off-site disposal of waste - Aside from its practical, environmental, and economic disadvantages, excavation and off-site disposal is a technically feasible technology. It is assumed that application of this technology would require complete excavation of the old (southern) portion of the landfill, in which the reported hazardous wastes was buried. This volume is estimated to be 2 million cubic yards.

- On-site incineration - Although potential logistical limitations with on-site incineration exist, the technology is technically feasible. In evaluating incineration, it has been assumed, as in the case of excavation and off-site waste disposal, that the southern area, which is one-half the total site volume, or approximately 2 million cubic yards, would be incinerated.

- Supplementary capping of landfill side slopes - The existing cap on the side slopes consist of a 2-foot layer of compacted glacial till, with a design permeability of $1x\ 10^{-5}$ cm/sec. To comply with the current RCRA guidelines for cap closure of a Subtitle C hazardous waste landfill, the side slopes need to utilize a combination membrane/soil cap with a 1×10^{-7} cm/sec permeability. This system will provide a uniform 1×10^{-7} cm/sec permeability cap throughout the site and it will significantly reduce the infiltration through the landfill sides. Taking into consideration the moderately steep side slopes (approximately 20%), this is a technically feasible and appropriate technology for the site.

- Slurry wall - A continuous layer of lodgement till with an average permeability of 6.7×10^{-5} cm/sec underlies the site and acts as a relatively impermeable geologic unit which can serve as the wall's foundation. The slurry wall and would be used around portions of the site perimeter in conjunction with a drain system, to prevent the entry of clean water into the leachate collection drain.

- Leachate collection drain - From a technical standpoint, the drain could be constructed around portions of the landfill perimeter to intercept lateral groundwater flow from the site. The drain would rest atop lodgement till and will be constructed only along those sections of the landfill perimeter where there exists a significant depth of saturated soil overlying lodgement till (i.e., southwestern and northern portions of the site).

Table 4 (continued)
Appropriate Remedial Technologies

- Off-site leachate treatment - Leachate from the landfill, which is collected by the existing leachate collection system in the newer (northern) section of the site, is presently taken to the City of Fulton municipal wastewater treatment plant. Continued use of this facility, or alternate municipal/private treatment facilities, is a feasible technology for disposal of leachate.

- On-site leachate treatment - A variety of treatment technologies are available for on-site treatment of leachate at the Volney Landfill. Among these, the process train considered to be most feasible includes flow equalization, batch biological treatment and carbon adsorption.

Table 5
Preliminary Remedial Action Alternatives

Alternative Number	Description
1	No action with site monitoring
2	Excavation and off-site waste disposal
3	Supplementary capping of landfill side slopes
4	Supplementary capping of landfill side slopes, slurry wall, leachate collection drain and off-site leachate treatment
5	Supplementary capping of landfill side slopes, slurry wall, leachate collection drain and on-site leachate treatment
6	Supplementary capping of landfill side slopes, leachate collection drain and off-site leachate treatment
7	Supplementary capping of landfill side slopes, leachate collection drain and on-site leachate treatment
8	Slurry wall, leachate collection drain and off-site leachate treatment
9	Slurry wall, leachate collection drain and on-site leachate treatment
10	Lechate collection drain and off-site leachate treatment
11	Leachate collection drain, and on-site leachate treatment
12	On-site incineration

DETAILED EVALUATION OF ALTERNATIVES

As a result of the screening process, a total of eight remedial action alternatives were developed for detailed comparative evalution at the Volney Landfill site. To be consistent with CERCLA provisions which promote the use of treatment technologies, on-site incineration was carried through the screening process. The no-action alternative was also included in the detailed evaluation. These eight feasible remedial alternatives, and their associated capital costs, operation and maintenance present worth costs and total present worth costs are provided in Table 6. This table also provides the estimated time to implement each remedial alternative from the completion of the RI/FS.

A detailed evaluation of each of the eight alternatives remaining after the initial screening was conducted in the RI/FS, consistent with 40 CFR Section 300.68(h) of the NCP. The non-cost, and cost evaluation criteria were discussed in the RI/FS.

The detailed analysis of the eight remedial action alternatives is summarized as follows:

Alternative 1 - No-Action with Site Monitoring

Evaluation of the no-action alternative is required by the NCP. This alternative consists of allowing the site to remain in its existing condition. However, a groundwater monitoring program would be initiated to allow periodic reassessment of human health and environmental risks posed by the site.

The assumed length of long-term groundwater monitoring is 30 years. This monitoring program is directed solely toward evaluating groundwater quality in the immediate vicinity of the landfill. In doing so, it would provide a data base for ongoing assessment of health risks associated with groundwater contamination, and a basis for evaluating the effectiveness of remedial measures to be implemented at the landfill. It would not, however, specifically address the impact of the site upon surface water quality, nor would it attempt to establish the limits of groundwater contamination, originating from the site, in horizontal or vertical directions. These objectives will be addressed as part of a recommended supplemental RI/FS for the contamination pathways.

Table

Remedial Alternatives Summary

rnative mber	Components	Total Costs Capital ($ x 10^3)	O & M ($ x 10^3)	Present Worth ($ x 10^3)	Time to Implement from RI/PS	Comments
l	No Action with Site Monitoring	___	271	271	0 yrs.	Will not protect human health and environment.
2	Excavation and Off-Site Waste Disposal	538,264	271	538,535	5	2 million cubic yds. Under SARA- "Least favored alternative".
3	Supplementary Capping of Landfill Side Slopes	8,672	328	9,000	3	Prevents direct contact risk but does not eliminate leachate migration.
4a	Slurry Wall with Leachate Collection and Off-Site Leachate Treatment	7,218	2,976	10,194	3	Does not comply with RCRA.
4b	Slurry Wall with Leachate Collection and On-Site Leachate Treatment	7,553	2,020	9,573	3	Does not comply with RCRA.
5a	Supplemental Capping and Slurry Wall with Leachate Collection and Off-Site Leachate Treatment	12,754	882	13,636	3	Effective in elimin. direct contact and reducing leachate migration. Complies with RCRA.
5b	Supplemental Capping and Slurry Wall with Leachate Collection and On-Site Leachate Treatment	12,876	691	13,567	3	Same as Alternative 5a.
6	On-Site Incineration	799,064	271	799,335	7	2 million cubic yds. Insufficient space available to site units.

For residential and monitoring well sample locations, reference is made to the baseline health risk assessment conducted in the RI/FS, which utilized data from selected residential and monitoring wells to evaluate potential health risks associated with contaminated groundwater in the site's vicinity. These previously selected well locations are, with some modifications, considered appropriate for long-term groundwater monitoring. Table 7 summarizes the proposed long-term groundwater monitoring program at the site. The locations of sampling points referred to on this table are shown in Figure 5.

To evaluate seasonal fluctuations in groundwater quality, it is recommended that initially, for a period of two years, all residential and monitoring wells be sampled and analyzed on a quarterly basis. Thereafter, the program frequency could be substantially reduced, unless the data indicates the need for more frequent monitoring. From the third year onward, it is recommended, pending review of the initial two years' data, that sampling and analysis be reduced to an annual basis. Further, it is estimated, that after the second year, the number of monitoring wells sampled could selectively be reduced to one-half the number used initially (i.e., from 16 to 8).

The closure plan that was implemented by the County of Oswego will not be considered a component of the no-action alternative. The County's leachate collection system, off-site leachate disposal operations and monitoring of residential wells would continue to be operated by the County independent of the CERCLA no-action alternative.

The no-action alternative is not appropriate at this site because it would not provide protection to human health and the environment since it would continue to allow migration of contaminants into the groundwater. The majority of leachate generated at the site is due to infiltration of the landfill side slopes. If these side slopes are left in their present condition, precipitation at the site would continue to leach mobile contaminants from the source. As a result, the potential for contaminants from the site to reach the private wells in the area would increase.

This alternative is also not consistent with the requirements of RCRA Section 264.310, which requires closure and post-closure of landfills that manage hazardous wastes.

TABLE 7

PROPOSED LONG-TERM GROUNDWATER MONITORING PROGRAM

SAMPLE LOCATIONS

Residential Wells

RW-1A	RW-5
RW-1B	RW-6
RW-2	RW-7
RW-3A	RW-10
RW-3B	RW-11
RW-4	

Monitoring Wells*

GW-3C	VBW-1
GW-3D	VBW-2
GW-5	VBW-3S
GW-7R	VBW-3BR
GW-9	VPW-13
GW-11A	VBW-16
GW-12A	
GW-14A	
GW-17	
SGW-28	

* Reduce number of monitoring wells from 16 to 8 after 2nd year

ANALYTICAL PARAMETERS

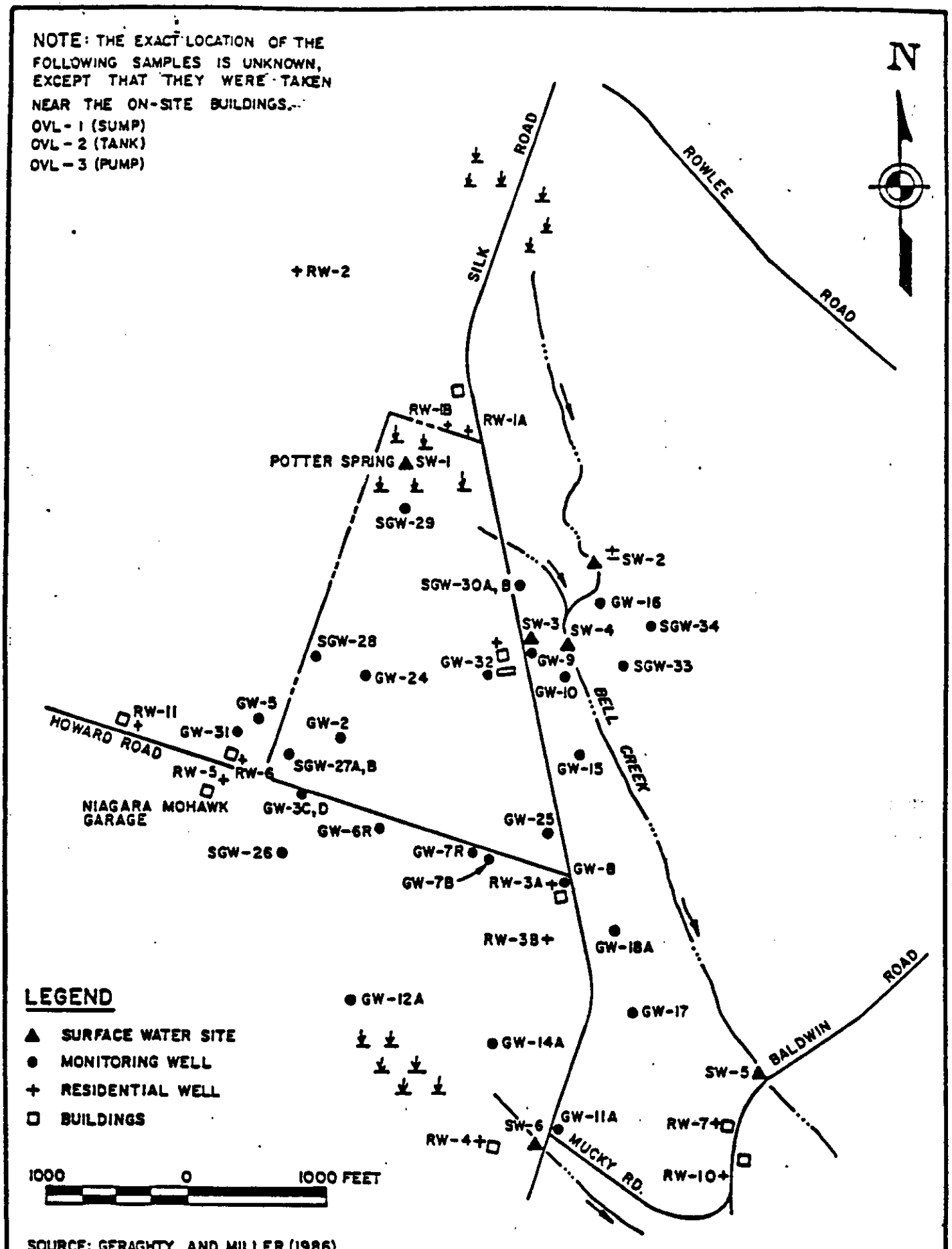
HSL Volatile Organics
Total Phenols
Metals:
- Arsenic
- Beryllium
- Iron
- Lead
- Manganese
- Mercury
- Nickel
- Selenium
- Thallium
- Zinc

Leachate Indicators:
- Alkalinity
- Ammonia Nitrogen
- Chemical Oxygen Demand (COD)
- Hardness (Calcium)
- Total Dissolved Solids (TDS)
- Total Organic Carbon (TOC)
- Specific Conductance**
- pH**
- Temperature**

** Field Measurement

SAMPLING FREQUENCY

Years 1 through 2: Quarterly
Years 3 through 30: Annually



SOURCE: GERAGHTY AND MILLER (1986)

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PREVIOUS INVESTIGATION SAMPLING LOCATIONS

FIGURE 5

Without effective source control, contaminants from the site would continue to migrate through the groundwater and could potentially reach the private drinking water wells in the area. In addition, surface breakouts of leachate through the side slopes would continue.

There are no capital costs associated with the no-action alternative since the existing monitoring well network will be utilized. The 30 year present worth operation and maintenance (O&M) cost for the no-action alternative is estimated to be $271,000.

Alternative 2 - Excavation and Off-Site Waste Disposal

This alternative involves excavation of the old (southern) section of the landfill, with subsequent transportation to and disposal at a RCRA permitted off-site landfill. Since the specific location of hazardous wastes at the site is unknown, (other than the waste was deposited in the old portion of the landfill) it has been assumed that the entire southern portion of the landfill (approximately 2 million cubic yards) would have to be excavated (See Figure 2). Although there are several off-site RCRA landfills in western New York State located approximately 200 miles from the Volney landfill, the likelihood of any single commercial off-site landfill having the capacity to accept these wastes is very small. Therefore, the off-site disposal aspect of this alternative is treated generically with an average transportation distance assumed to be 400 miles. A groundwater monitoring program would also be implemented as a component of this alternative.

Since it is believed that virtually all the hazardous wastes are contained in the southern portion of the landfill, excavating the fill from this section would effectively eliminate the contaminant source. However, any contaminants which may potentially be migrating from the site via surface and groundwater would not be addressed by this alternative.

The off-site transportation and disposal operations under this alternative would be subject to RCRA regulations 40 CFR Sections 262 and 263. These regulations include requirements for containerization, manifesting and transportation of excavated materials. In addition, Section 121(d)(3) of CERCLA states that any hazardous substance or pollutant or contaminant shall only be transferred to a facility which is operating in compliance with Section 3004 and 3005 of the Solid Waste Disposal Act or other applicable environmental law. The excavation operations would also be conducted in accordance

with relevant Occupational Safety and Health Administration regulations specified in 29 CFR Section 1910.120.

The short-term risks associated with this alternative are substantial. Since excessive off-site transportation of waste materials would occur with this alternative, there is an increased potential risk of accidents that may result in discharge of contaminated materials to the environment. In addition, there would be an increase in truck traffic in the local community.

Excavation and removal of the entire south section of the landfill would create problems from both a construction and implementation standpoint. The logistics of excavating and transporting 2 million cubic yards of fill material and the capability of a secure RCRA landfill to accept this quantity of material is a major issue. Excavation in the waste fill could easily cause landfill fires since there are dry sections within the fill and explosions from continued methane gas pockets is a possibility also.

Alternative 2 is not consistent with Section 121(b)(1) of CERCLA since the off-site transport and disposal of hazardous substances without treatment is the least favored alternative remedial action where practical treatment technologies are available. Even though practical treatment of the entire 2 million cubic yards of contaminated fill is not plausable, technologies can be implemented that will partially reduce the toxicity, mobility or volume of the wastes at the site.

The capital cost for site excavation and off-site waste disposal is estimated to be $538,264,000. The 30 year present worth O&M cost is $271,000 and the total present worth is estimated to be $538,535,000.

While the implementation of this alternative (which is estimated to take approximately 5 years from the completion of the RI/FS) would provide effective and complete removal of the contaminants in the southern portion of the landfill, the associated impacts to the community due to waste handling aspects of excavation, would be prohibitive. Since alternatives are available that would meet the source control objective of this operable unit at a significantly lower cost and still provide protection to human health and the environment, this excavation option was not retained for further consideration.

Alternative 3 - Supplemental Capping of Side Slopes

The purpose of supplementary capping is to reduce leachate generation and migration from the site. This cap would reduce the majority of infiltration through the landfill side slopes. This alternative involves capping approximately 35 acres lying between the limits of the existing PVC membane liner and compacted lodgement till, and a line lying parallel to and approximately 45 feet beyond the existing limits of refuse. This offset allows the cap to be extended over a potential perimeter leachate collection drain and/or slurry wall. The supplementary cap would be placed over the existing 2 foot layer of compacted, seeded lodgement till as follows:

> Existing vegetation would be removed from the surface by scraping, and the resulting loosened surface would be recompacted by rolling. A 6-inch layer of sand would be added to provide support for a 60-mil high density polyethlene (HDPE) liner, textured to reduce the possibility of slippage by the overlying drainage layer. Above the HDPE membrane, a 24-inch layer of sand would be placed, followed by a 12-inch layer of topsoil or suitably amended native soil. The surface would be fine-graded, seeded and mulched.

The landfill side slopes presently range from 15 to 25 percent and the cover includes a 2-foot thickness of compacted glacial till with a design permeability of 1×10^{-5} cm/sec. Section 300.68(i) of the NCP, and Section 121 of CERCLA states that CERCLA remedial actions should comply with ARARs. For covers at CERCLA sites, this means that the RCRA technical requirements contained in 40 CFR Section 264.310 are relevant and appropriate for the Volney Landfill site, and should be met. Recommended guidance that has been developed for meeting the five regulatory requirements are stated in Section 264.310. This policy requires that at a minimum, the final cover at hazardous waste sites consist of a vegetative top cover, a middle drainage layer, and a low permeability bottom layer. The low permeability bottom layer must include at least two feet of soil recompacted to a saturated hydraulic conductivity of not more than

1 x 10^{-7} cm/sec. The 60-mil HDPE liner of the proposed supplemental side slope cap would meet the 1 x 10^{-7} cm/sec permeability requirement. This would also result in a uniform closure of the entire site, since the landfill top currently employs a 1 x 10^{-7} cm/sec permeability cover. The combination membrane and soil barrier that would be installed will minimize the erosion and abrasion that is currently taking place on the side slopes and will prevent further deterioration of the existing soil cap. Side slope capping is also consistent with remedial actions taken at other similar sites (Combe Fill South, GEMS and Helen Kramer NPL sites).

Due to the relatively steep side slopes of the existing landfill and the insufficient site area available for regrading the landfill, the proposed supplemental capping would not meet the minimum slope requirements of between 3 to 5% or a soil loss of less than 2.0 tons/acre/year, as stated in the RCRA guidance for the vegetated top cover. However, regrading of the fill may be incorporated into the final cover design so as to provide 10-foot wide terraces at vertical elevation changes of approximately 20 feet. These terraces would reduce erosion and provide access to the landfill side slopes for future maintenance. The design phase would further provide a detailed erosion/sediment control plan, especially addressing the sand layer overlying the HDPE liner. At the same time, safegaurds need to be established to prevent damage to the existing membrane liner and gas collection system on the top of the landfill.

Supplementary capping of the side slopes, not in conjunction with other remedial components, only reduces the quantity of leachate generated at the site and does not prevent the leachate from migrating away from the site.

The estimated time to implement Alternative 3 from the completion of the RI/FS is 3 years.

- This alternative will also include a long-term monitoring program.

The capital cost associated with supplemental capping of the 35 acres of landfill side slopes is estimated to be $8,672,000. The 30 year present worth O&M cost is $328,000 and the total present worth cost for this alternative is $9,000,000. Based on the above discussion, Alternative 3 will be retained for further evaluation.

Alternative 4a - Slurry Wall with Leachate Collection and Off-Site Leachate Treatment

Leachate collection involves the installation of a gravel trench drain and accompanying slurry wall around portions of the landfill perimeter where there exists a significant depth of saturated sediments overlying lodgement till. Based upon current estimates, these conditions occur along two sections of the perimeter: (a) around the north side of the site and (b) around the southwest corner of the site. The gravel drain would consist of a stone-filled trench, four feet wide, lined with filter fabric, and installed by excavation with temporary sheet piling. The drain would be excavated to the top of the lodgement till surface. At its two low points in the north drain segment, and at one in the southwest segment, collection wells would be installed consisting of 14-inch diameter stainless steel wells with stainless steel pumps and controls. These pumps would discharge leachate via an underground force main from the collection system to an equalization/storage facility, for off-site treatment.

The slurry wall accompanying the drain would be located on the outside of the drain, to minimize the entry of clean water into the collection system from beyond the landfill limits. The slurry wall would be backfilled with soil and bentonite mixture, using soil excavated from the trench, and it would be keyed approximately 3 feet into the relatively impermeable (6.7×10^{-5} cm/sec) lodgement till.

Off-site leachate treatment involves treating the leachate at a local POTW. At the present time, leachate collected from the newer (northern) portion of the Volney Landfill is treated at the Fulton Wastewater Treatment Plant. Negotiations for long-term leachate treatment with an acceptable treatment facility would be undertaken during the remedial design. Although the feasibility and cost of using a facility on a long-term basis has not been established, the cost of off-site leachate treatment has been generically estimated at $0.079 per gallon, which includes a transportation cost of $0.01 per gallon. This alternative for off-site treatment of the leachate also includes the construction of a 1,000,000 gallon concrete storage tank on-site. Based on an average leachate flow of 13,000 gal/day, this proposed storage tank will be able to provide storage for approximately 77 days of normal leachate flow.

During the design of the leachate storage tank for off-site treatment, a determination would have to be made whether or not the tank would be used for more than 90 day leachate storage. If the residence time for hazardous waste leachate in the tank is expected to exceed 90 days, then RCRA would be relevant and appropriate. The new RCRA tank regulations (40 CFR 264.190 to 264.199) which became effective January 12, 1987 include a requirement for secondary containment as well as design and construction specifications. These modifications, if deemed necessary, would be addressed during the remedial design phase.

In addition to the above requirements, an EPA policy memorandum dated April 15, 1986 (see attached) addresses the discharge of wastewater from CERCLA sites into POTWs. This memorandum requires that adequate analyses be performed to demonstrate that the CERCLA discharage will not cause plant upset or contravention of water quality standards. A determination as to which POTW or alternative leachate treatment facility would be used to treat the Volney leachate and the status of their compliance with appropriate permits would be made during the remedial design phase. A treatability study would also be conducted to determine whether the specific leachate characteristics are able to be treated effectively by the proposed treatment facility, so as not to cause contravention of appropriate water quality standards.

The function of the perimeter leachate drain for this alternative is to collect leachate migrating laterally outward away from the landfill. Because of this site's irregular stratigraphy, however, it is anticipated that this drainage collection system would effectively intercept most, but not all of the estimated 13,000 gal/day of leachate flowing from the landfill. This alternative provides physical containment of most of the contaminants within the landfill, although the quantity of leachate being generated would not be significantly reduced. This is due to the insufficient cap on the landfill side slopes resulting in substantial infiltration. Therefore, this alternative does not comply with the Section 264.310 provisions of RCRA regarding final covers at facilities that manage hazardous wastes.

Utilizing the drain without an accompanying slurry wall would result in significant quantities of clean groundwater flowing into the leachate collection system. It has been estimated during the RI/FS that the slurry wall would be capable of preventing 90 percent of the clean groundwater flow from outside the limits of the landfill from reaching the drain and consequently reduce the volume of leachate that would be collected and treated.

The cost for treating leachate generated from this site at a publicly owned or private wastewater treatment facility is highly variable. It depends not only upon the chemical nature of the leachate, but also the size, design and operating condition of the plant; the regulatory status of the plant regarding acceptance of extraneous waste streams and the owner of the facility generating leachate (e.g., public or private). For purposes of this alternative analysis, a cost for leachate treatment has been estimated at $0.079 per gallon.

The perimeter leachate drain, like supplemental capping of the landfill side slopes is feasible to construct, but precautions need to be taken to assure successful implementation. The gravel fill drain will extend to depths as great as 40 feet, requiring the use of temporary sheeting during construction. In addition, the placement of filter fabric along the drain and installation of collection wells at its low points will require careful planning and construction management.

Wall failure related to physical stress/strain can cause cracking and seepage through the slurry wall; however, this type of failure is expected to be rare. Should this failure occur, one of three restoration methods is recommended: grouting; re-excavation and re-backfilling or installation of a synthetic liner in the areas suspect to failure.

Neither supplementary capping nor leachate collection are 100 percent effective at preventing leachate generation or collecting leachate, respectively. In combination, however, they reinforce one another and provide the maximum possible reduction of leachate migration from the site. The estimated time to implement Alternative 4a from the completion of the RI/FS is 3 years.

The capital cost associated with installation of the slurry wall with leachate collection and off-site leachate treatment is estimated to be $7,218,000. The 30 year present worth O&M cost are $2,976,000 and the total present worth cost for this alternative is $10,194,000. Based on the previous evaluation, Alternative 4a will be retained for further consideration.

Alternative 4b - Slurry Wall with Leachate Collection and On-Site Leachate Treatment

The soil and bentonite slurry wall with accompanying leachate collection system discussed previously for Alternative 4a would also be utilized with alternative 4b. Rather than utilize off-site treatment of leachate as discussed in Alternative 4a, this alternative will focus on treating the leachate on-site.

A preliminary leachate treatment system was considered during the RI/FS and was based on optimum organic removal, since organics are the major contaminants detected on-site. This system would not consider metals removal from leachate prior to discharge to surface water since maximum concentrations detected in groundwater would not exceed limits specified by New York State Water Quality Standards for surface water. Metals removal, however, may be required pending further detailed analysis of the data during the remedial design.

Based upon determinations made during the FS, the optimum process train for on-site treatment appears to include flow equalization, biological treatment and carbon adsorption. Major equipment items needed for this system would include a 150,000 gallon equalization/storage facility, a 50,000 gallon sequenced biological reactor (with manual powdered activated carbon addition) and a filter press. The design of process equipment for on-site treatment is based upon the expected rate of leachate generation and delivery to the system under existing conditions, without supplementary capping of the landfill side slopes.

Treated effluent would be discharged to Bell Creek. A determination as to the potential toxicity and final disposal of sludge produced from this on-site treatment process would be made during a treatability study during the remedial design.

The treatment plant would be located in the eastern portion of the site. Although other locations are possible, this one is easily accessible from Silk Road, and provides a direct effluent discharge route to Bell Creek, yet it does not encroach onto the landfill surface or into the 100-year flood boundary of Bell Creek. An integral component of the design

phase for on-site leachate treatment is bench scale or pilot scale treatability study testing. This would be required to determine the effectiveness of the selected unit processes, individually and collectively, with actual leachate from the Volney Landfill site. In addition, this testing would establish final design parameters for these processes. Pending the treatability study results, certain processes may have to be added, deleted or modified.

On-site leachate treatment would necessitate a significant amount of operation and maintenance (O&M). O&M considerations include personnel requirements, daily operating procedures, utilities and auxiliary materials. The proposed on-site leachate treatment system would operate in a batch mode, five days per week, eight hours per day, and would require utilizing one person per day to operate the plant.

Treating the leachate on-site with an effluent discharge to Bell Creek may require a New York State Pollution Discharge Elimination System (SPDES) permit. Parameters to be monitored for in the permit will be better defined following the treatability study during remedial design.

The 150,000 gallon tank in the case of on-site leachate treatment would be considered exempt from RCRA administrative requirements pertaining to the 90 day storage tank regulations. However, the substantiative technical requirements of the regulation would need to be followed. The other wastewater treatment system components would also be exempt from the administrative, not the substantiative requirements of RCRA regarding secondary containment, since they are considered an integral part of the treatment system.

Alternative 4b utilizing on-site leachate treatment is not a direct waste treatment technology, however, it is determined to be more in conformance with the CERCLA preference for utiizing on-site treatment than the off-site leachate treatment option.

Alternative 4b does not utilize supplemental capping of the side slopes, therefore, this option does not comply with RCRA Section 264.310 provisions pertaining to final covers at facilities that manage hazardous wastes.

The estimated time to implement this Alternative from the completion of the RI/FS is 3 years. The estimated capital cost for the slurry wall with leachate collection and on-site leachate treatment is approximately $7,553,000. The 30 year present worth O&M cost is $2,020,000 and the total present worth for this alternative is $9,573,000. Based on the above discussion, Alternative 4b will be retained for further consideration.

Alternative 5a - Supplemental Capping and Slurry Wall with Leachate Collection and Off-Site Leachate Treatment

The slurry wall with accompanying leachate collection system and off-site leachate treatment previously evaluated in Alternative 4a would also be utilized with Alternative 5a. An additional component to this alternative is supplemental capping of the landfill side slopes.

Since each of the individual components comprising this alternative have been discussed in previous alternatives evaluation, this analysis will be directed at the overall benefit or detriment derived from combining these components into Alternative 5a.

The primary advantage of combining supplementary capping of the landfill side slopes with leachate collection is the reduction to the maximum extent practical of lateral leachate migration from the landfill thereby protecting human health and the environment. This would in effect reduce the long-term O&M cost associated with leachate collection, and the cost associated with ultimate off-site leachate treatment. Utilizing the supplemental cap will comply with the technical requirements of RCRA and will virtually eliminate the direct contact threat. This cap would also minimize the erosion and abrasion that is currently taking place on the side slopes, and would eliminate the physical deficiencies of the existing side slope cap.

In addition to the lower cost associated with reduced leachate generation and handling, a far more important result is the higher degree of protection provided to the human health and the environment. As pointed out in the baseline risk assessment conducted during the RI/FS, monitoring well data indicates that there is a potential health risk associated with toxic chemicals from the site, but there exists a definable risk related to certain carcinogenic chemicals. This same assessment determined that data from residential wells near the site does not indicate any present health risk associated with toxic or carcinogenic chemicals migrating from the site. Since this alternative of combining supplementary capping and leachate collection provides the greatest reduction of leachate migrating from the site, the overall potential toxic and carcinogenic risk to the residents in the area is also reduced to the greatest extent practical. Since the quantity of hazardous surface water runoff from the site would be virtually eliminated, Alternative 5a also provides a high degree of protection to the environment.

The off-site leachate treatment component of Alternative 5a still has the same limitations as previously discussed in Alternative 4a. These include, RCRA regulations regarding storage tank design, compliance with appropriate permits for treatment, and the uncertainty of an acceptable off-site facility to receive the leachate. In addition, CERCLA policy which promotes on-site treatment will not be satisfied. The estimated time to implement Alternative 5a from the completion of the RI/FS is 3 years.

The capital cost for supplemental capping and slurry wall with leachate collection and off-site leachate treatment is estimated to be $12,754,000. The present worth O&M costs are $882,000 and the total present worth cost is $13,636,000. Based on the previous discussion, Alternative 5a will be retained for further consideration.

Alternative 5b - Supplemental Capping and Slurry Wall with Leachate Collection and On-Site Leachate Treatment

The difference between this alternative and Alternative 5a is the substitution of off-site leachate treatment with on-site leachate treatment. The evaluation of the remaining components in this alternative has been presented in the previous discussion of Alternative 5a.

The on-site leachate treatment component of Alternatve 5b still has the same advantages and disadvantages as previously discussed in Alternative 4b. Based on available data from the RI/FS, the process train selected for treating the leachate on-site would include flow equalization, biological treatment and carbon adsorption. All tanks that are an integral component of the on-site treatment system would be exempt from RCRA administrative, not substantiative requirements regarding storage tank regulations. However, since the effluent will be discharged into Bell Creek, a New York State Pollution Discharge Elimination System (SPDES) permit may be required.

Alternative 5b, which utilizes supplemental capping with leachate collection and on-site leachate treament, is in conformance with the specific objective (source control) of this operable unit and thereby provides a high overall degree of risk reduction to the residents and environment in the area. This alternative is also considered in conformance with CERCLA preference for utilizing on-site treatment and RCRA Section 264.310 closure requirements for hazardous waste landfills. As pointed out earlier, however, treatability study testing would be required during the remedial design phase to determine the effectiveness of selected unit processes with actual leachate from the Volney Landfill site. This uncertainity as to the specific treatment scheme to be utilized, along with the high level of O&M requirements and the need to conform with SPDES requirements, limit the potential utilization of this alternative.

The estimated time to implement Altertive 5b from the completion of the RI/FS is 3 years.

The capital cost for supplemental capping of the side slopes, slurry wall with leachate collection and on-site leachate treatment is estimated to be $12,876,000. The present worth O&M costs are $691,000 and the total present worth for Alternative 5b is $13,567,000. Based on the above discussion, Alternative 5b is retained for further consideration.

Alernative 6 - On-Site Incineration

This alternative involves excavation and on-site incineration of the old (southern) section of the landfill, encompassing an estimated 2 million cubic yards of waste materials. Since the specific location of hazardous wastes at the site is not known with any certainty, (other than the waste that was deposited in the old portion of the landfill) it has been assumed that the entire southern portion of the landfill would have to be excavated and incinerated.

To incinerate the two million cubic yards of waste material, a total of ten transportable rotary kiln incinerator units, each with a capacity of 150 tons/day, would be brought to the site and operated 24 hours/day, 5 days/week for approximately five years. The RI/FS assumed that the resulting ash from incinerating the wastes would be delistable (a procedure to determine if the residuals are non-hazardous), therefore, the "clean" material could be finally disposed of at a nearby nonhazardous waste facility. This is a difficult assumption to make in the absence of a treatability study or test burn. The material at the landfill could contain highly elevated concentrations of inorganics (e.g., lead or chromium) which may not be destroyed by conventional incineration or thermal destruction methods. The residual ash would still be considered hazardous and would have to be disposed of at an approved RCRA landfill or dispossed on-site in conformance with RCRA regultions; both of which would not be cost-effective. A determination of whether the volume of soil will be reduced or increased as a result of this alternative will be made during the trial/test burns.

An additional limitation with the incineration alternative is the available area to house these ten units. Sufficient area within the fenced area of the site for these trailer mounted transportable incinerators to set-up and operate does not exist.

Since the incinerators would be operating on-site, federal and state and local permits would not be required for this remedial action. However, CERCLA requires that the remedial action comply with the technical requirements of applicable or relevant and appropriate environmental laws. Relevant and appropriate RCRA regulations that apply to owners and operators of hazardous waste incinerators are found in 40 CFR Sections 264.340 to 264.999.

Alternative 6 requires the highest level of operational requirements of the remedial action alternatives evaluated. It would take approximately 5 years to incinerate the entire southern portion of the site. Therefore, the estimate time to implement this Alternative from the RI/FS completion is 7 years. Some operational requirements that are necessary to implement the remedial action include, supplemental fuel in case the BTU value of the fill material is not suffcient, operation of each unit, specific monitoring of the air emissions and residual ash, and excavation and final disposal of ash.

Should pending trial/test burns determine that the fill material could be incinerated and delisted, this alternative would be most effective in conforming with the CERCLA preference for permanently destroying the wastes on-site.

The capital cost for on-site incineration is estimated to be $799,064,000. The 30 year present worth O&M costs are $271,000 and the total present worth for Alternative 6 is $779,335,000. Based on the above evaluation, Alternative 6 is not considered for further consideration.

COMMUNITY RELATIONS

Pollution Abatement Services (PAS) of Oswego is an NPL site occupying about 15 acres of land immediately east of the City of Oswego, New York. During the operation of the PAS site, wastes were taken off-site and were allegedly disposed of at the Volney Landfill, Fulton Terminals and the Clothier Disposal NPL sites.

Thoughout the Volney Landfill site's history, community concern and involvement has been high. Local citizens have organized the following four groups to address the community concerns regarding the above sites: Fulton Safe Drinking Water Action Committee for Environmental Concerns, Inc. (FSDWA); NOMORE; S.T.O.P.; and Toxic Action Coalition. The latter ot these groups was established to tie the other three groups together.

Each of these groups and the local community are extremely concerned about issues pertaining to the sites, such as the extent of contamination and its public health impact, the proposed remediation and the timing for implementing the remedy at each of the sites. Of the above groups, S.T.O.P.'s concerns regarding the Volney Landfill were directed toward opposing the siting of the Bristol Hill Landfill in the area. This landfill has been operating since September 1983 and is located approximately two miles southwest of the site.

Various public information meetings have been conducted throughout the sites' NPL history to inform the community of the remediation progress. The public review and comment period for the draft RI/FS prepared by the State's consultant, URS Company, Inc. was initiated on May 26, 1987. Following a request for extension of the public comment period by the potentially responsible parties (PRPs), the comment period was extended an additional twenty-one days to July 15, 1987, resulting in a total of 45 days for the public comment period. The public repositories for the draft RI/FS are the Volney Town Clerk's Office, Fulton City Library, FSDWA/S.T.O.P office and the NYSDEC Region 7 Office in Liverpool, NY. The public was notified of the RI/FS availability by a press release which appeared in the Syracuse Post Standard (Oswego edition) and the Palladium Times. A public meeting was held on June 15, 1987 at the Volney Town Hall, which was attended by approximately seventy-five people, including local citizens groups, elected officials, the press, and area residents.

A summary of the comments raised concerning the RI/FS and public meeting are contained in the attached responsiveness summary. The local community is generally in agreement with the proposed remedy. The responsiveness summary also includes a copy of press release announcing the meeting and an attendance list for the public meeting.

ENFORCEMENT ANALYSIS

PRPs at the Volney Landfill site fall within three general categories. Namely, owner/operator, direct contributor and generators of drummed waste which was sent to the PAS site through January 1975 which may have been redisposed of at the Volney site (PAS Generators). Although some direct contributors have been tentatively identified, the search for additional PRPs is ongoing.

Notice letters for the performance of the RI/FS were sent to the PAS Generators on March 21, 1985. On June 5, 1987, the USEPA informed PRPs of, among other things, their potential liability at the site, the availability of the RI/FS report, the close of the public comment period and the cost incurred by the government at the site to date.

The USEPA intends to send notice to the PRPs in accordance with the Special Notice Procedures outlined in Section 122(e) of CERCLA, upon approval of the ROD. The PRPs will be afforded sixty days from receipt of such notice to make a proposal to finance or undertake the activities required in the ROD. The USEPA will evaluate such a proposal and will determine if the proposal is a substantial one which warrants a sixty day extension for negotiations. If no such proposal is made, or if the proposal is not a substantial one as deemed by the USEPA, then the USEPA will consider the issuance of an Administrative Order pursuant to Section 106(a) of CERCLA and/or take response actions consistent with Section 104(a) of CERCLA.

The recommended alternative (Alternative 5(a or b)), for the Volney Landfill site consists of the following components:

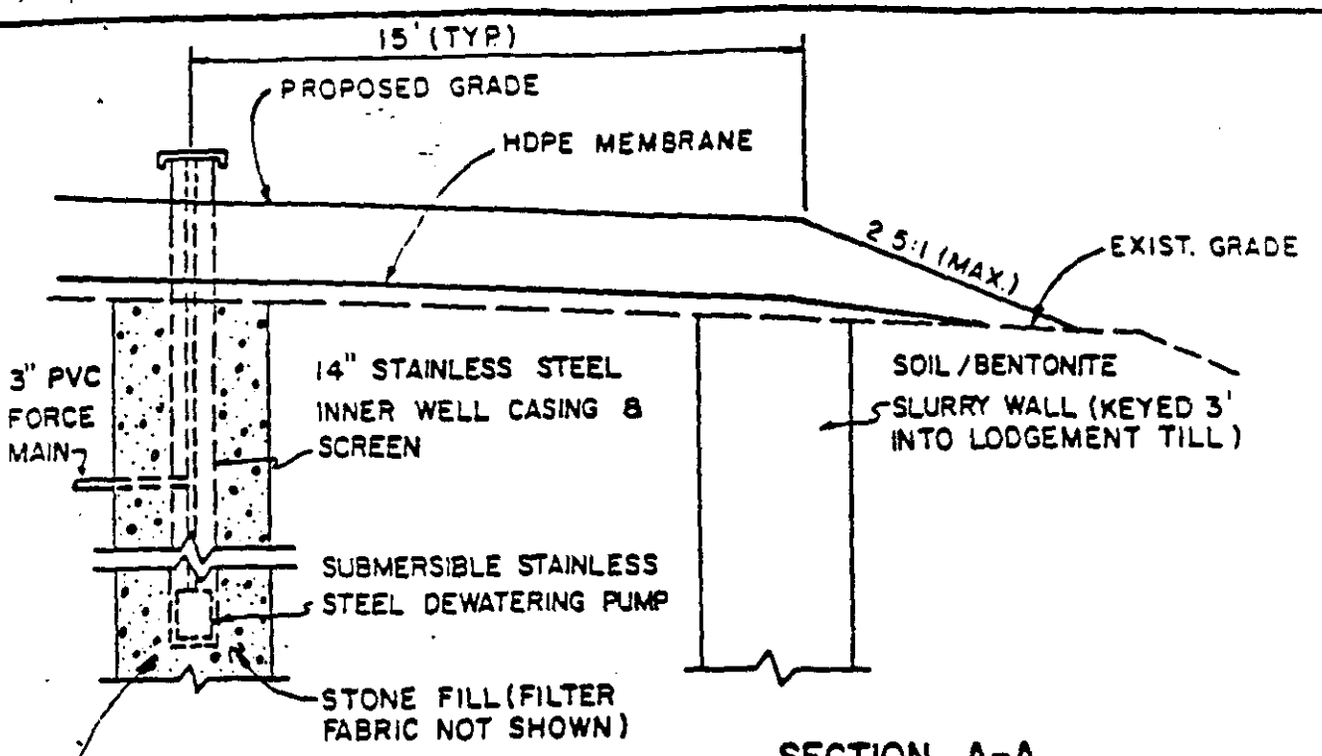
1. Supplementary capping of the landfill side slopes covering approximately 35 acres lying between the limits of the existing PVC membrane liner and a line lying parallel to and approximately 45 feet beyond the existing limits of refuse (see Figure 6). This offset allows the cap to be extended over the perimeter leachate collection drain and slurry wall. This cap will satisfy RCRA requirements which is relevant and appropriate for this site (ARAR). RCRA 40 CFR Section 264.310 requires a maximum permeability of 1×10^{-7} cm/sec for final cover closure design for landfills that manage hazardous waste.

   The supplementary cap will be placed over the existing 2-foot layer of compacted, seeded lodgement till in the following manner:

   > Existing vegetation will be removed from the surface by scraping, and the resulting loosened surface will be recompacted by rolling. A 6-inch layer of sand will be added to provide support for a 60-mil high density polyethylene (HDPE) liner, textured to reduce the possibility of slippage by the overlying drainage layer. Above the HDPE membrane, a 24-inch layer of sand will be placed, followed by a 12-inch layer of topsoil or suitably amended native soil. The surface will be fine-graded, seeded and mulched. Regrading of the fill may be incorporated into the final cover design so as to provide 10-foot-wide terraces at vertical elevation changes of approximately 20 feet. (The purpose of these terraces is to reduce erosion and provide access to the landfill side slopes for future maintenance.)

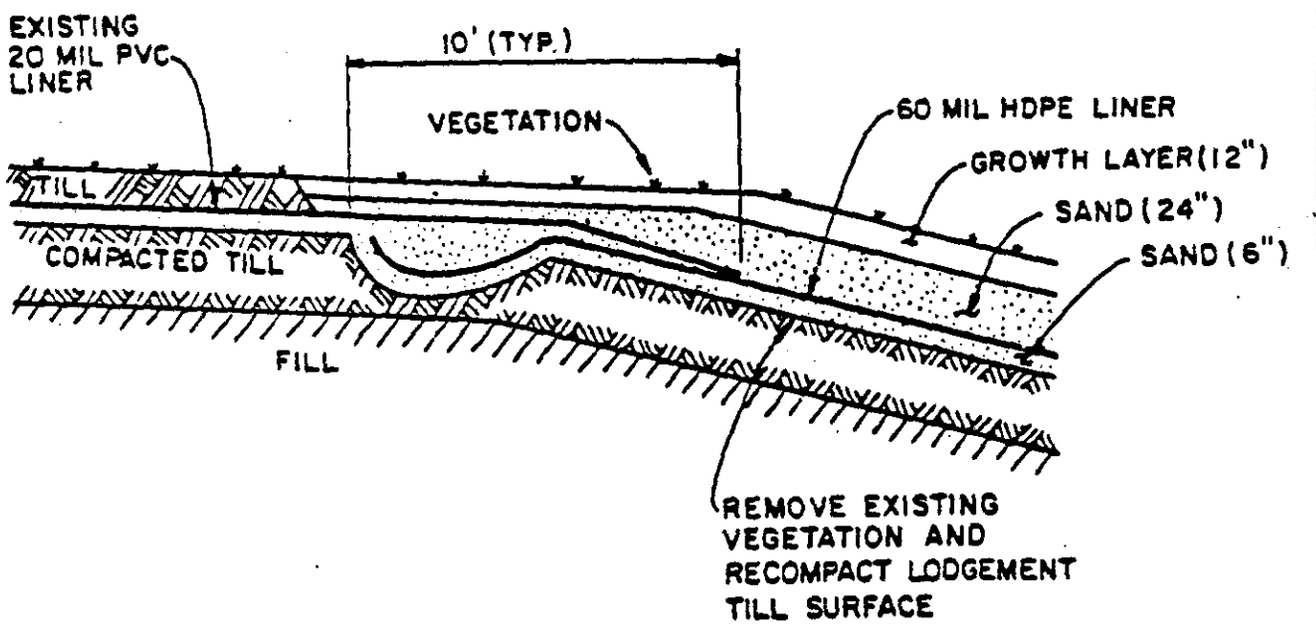
   A passive gas venting system will also be incorporated into the supplementary cap. Figure 6 indicates the approximate limits of the proposed supplementary cap, and Figure 7 shows its sectional relationship to the existing PVC membrane on the landfill top, and to the proposed leachate collection drain/slurry wall.

2. The leachate collection system will consist of a perimeter leachate collection drain and slurry wall around the northern and southwestern sections of the landfill, with an accompanying force main from the two drain segments to either a new on-site leachate treatment facility on the east side of the site or to a storage tank to await off-site treatment.



SECTION A-A
CAP CONNECTION TO COLLECTION SYSTEM

NOT TO SCALE



SECTION B-B
CAP CONNECTION TO EXISTING PVC MEMBRANE

NOT TO SCALE

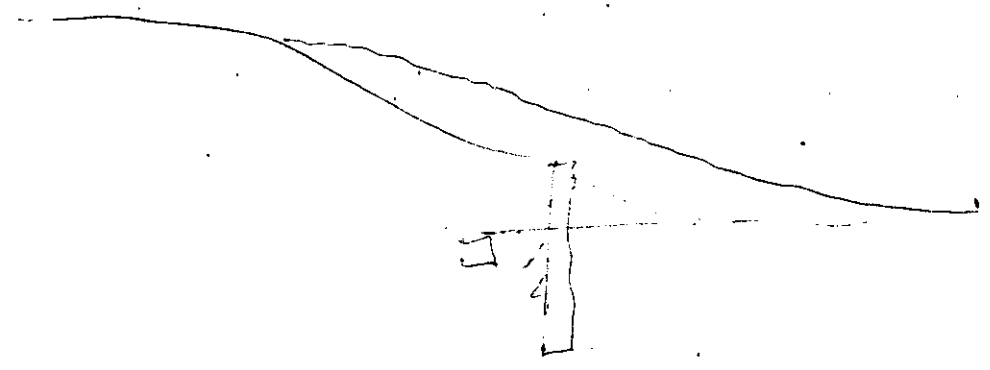
URS Company, Inc. CONSULTING ENGINEERS NEW YORK NEW JERSEY	RECOMMENDED REMEDIAL PLAN—SECTIONS	FIGURE 7

The leachate collection drain segments will lie parallel to and approximately 30 feet outside of the limits of refuse in the northern and southwestern sections of the site. Although a detailed geotechnical investigation will have to be performed along the drain alignment prior to final design, subsurface conditions have previously been estimated during the RI/FS. The north drain will extend approximately from stations 31+00 to 51+20, and the southwest drain approximately from stations 60+00 to 9+20 (see Figure 6). These are the estimated reaches along which there exists a significant depth of saturated sediments overlying lodgement till. The drain will extend from the ground surface down to the top of lodgement till. In the north, this corresponds to an average depth of approximately 31 feet and a maximum depth of approximately 39 feet over the 2,020 foot drain length. The southwest drain will have an average depth of approximately 19 feet, with a maximum depth of approximately 36 feet over its 1,780 foot length.

The leachate collection drain will consist of a stone-filled trench, four feet wide, lined with filter fabric and installed by excavation with temporary sheet piling or other approved method. At relative low points along the lodgment till surface which the drain will follow, collection wells will be installed. These collection wells will consist of 14-inch diameter stainless steel casings and screens, with stainless steel pumps and controls. It is estimated that two collection wells will be required along the north drain segment and one along the southwest drain. From each well, an underground force main will convey leachate to the proposed leachate treatment/collection facility.

3. Approximately 15 feet outside of the collection drain, a soil and bentonite slurry wall will be constructed with a key depth approximately three feet into the lodgement till. The purpose of this slurry wall is to minimize the entry of clean water from beyond the landfill limits into the leachate collection system.

4. The contaminated leachate from the leachate collection system will be treated on-site or transported to an off-site facility for treatment.



Based upon the available data, the optimum on-site treatment system would include a 150,000 gallon flow/equalization storage facility, biological treatment and carbon adsorption. The treated effluent may require a New York SPDES permit with discharge to Bell Creek. The sludge would also be tested to determine if it is considered hazardous, and then disposed of at an appropriate facility. Off-site treatment would involve temporarily storing the collected leachate in a one million gallon concrete storage tank. The leachate would then be transported via tank truck to an acceptable POTW or private treatment, storage and disposal facility.

Using cost as a basis for comparison, both on-and off-site leachate treatment are virtually identical. For purposes of this analysis, the costs for off-site leachate treatment will be used since they are slightly higher and therefore more conservative than the cost for on-site treatment. A determination as to whether the leachate will be treated on or off-site will be made pending the results of the treatability studies to be conducted during the remedial design. These studies will determine the more cost-effective alternative for treating the leachate.

5. A 30-year groundwater sampling program to monitor changes in the nature and extent of contamination at the site.

6. CERCLA requires a review of the recommended remedial containment action no less than every 5 years after the initiation of the proposed remedy to assure that human health and the environment are being protected.

7. An additional operable unit RI/FS of the contamination pathways will be conducted which will further define the extent of contamination in the bedrock groundwater south of the site and the potential contamination of the stream/wetland ecosystems downgradient from the site.

Cost estimates for the proposed remedial action are contained in Attachment E. As noted above, for cost estimating purposes the alternative utilizing off-site treatment is used (Alternative 5a). The actual method for leachate treatment will be determined during remedial design.

The capital cost for the proposed remedial action is estimated to be $12,754,000. The 30 year present worth O&M cost is $882,000 and the total present worth cost for the recommended alternative is $13,636,000.

Operation and Maintenance

O&M are those costs required to operate and maintain the remedial action throughout its lifetime. These activities ensure the lifetime effectiveness of the remedial alternative selected.

The recommended alternative involves supplemental capping of the landfill side slopes with a leachate collection system along the northern and southwestern portions of the site. It is estimated that three, 14-inch diameter stainless steel collection wells will be installed at relative low points along the lodgement till surface which the drain will follow. These pumps and controls are anticipated to be replaced in 15 years (half the design life of the remedial action). The accompanying slurry wall is intended to minimize the entry of clean water from beyond the landfill limits into the leachate collection system.

A determination as to whether the collected leachate from this system will be treated on-site or sent to an off-site facility for treatment, will be made pending the results of the treatability studies to be conducted during the remedial design.

Based upon the RI/FS findings, the optimimum system for on-site leachate treatment consists of flow equalization, biological treatment and carbon adsorption. O&M considerations include personnel requirements, daily operating procedures, utilities and auxiliary materials. The system will operate in a batch mode, five days per week, 8 hours per day and will require utilizing one person per day to operate the plant. The treated leachate will be discharged into Bell Creek which is located to the east of the site and will be required to conform to New York SPDES permit requirements.

Off-site treatment would involve temporarily storing the collected leachate in a one million gallon concrete storage tank. The leachate would then be transported via tank truck to an acceptable POTW or private treatment, storage and disposal facility.

In either of the above alternatives, routine O&M will be required to maintain the integrity of the selected remedy. Regrading and mowing of the landfill top and supplemental cap will also be required to maintain the proposed system.

As part of the remedial action, a 30-year groundwater sampling program is included to monitor changes in the nature and extent of contamination at the site to determine the effectiveness of the operation.

To evaluate seasonal fluctuations in groundwater quality, it is recommended that initially, for a period of two years all residential and monitoring wells be sampled and analyzed on a quarterly basis. Thereafter, the program frequency can be substantially reduced, unless the data indicates the need for more frequent monitoring. From the third year onward, it is recommended, pending review of the intial two years' data, that sampling and analysis be reduced to an annual basis. Further, it is estimated that, after the second year, the number of monitoring wells sampled can selectively be reduced to one-half the number used intially (e.g., from 16 to 8).

The annual and present worth O&M requirements for the recommended remedial alternative are as follows:

Table 8
Annual and Present Worth Operation and Maintenance Costs for Recommended Remedial Action

Component	Annual Cost	Present Worth Cost (assume 30 years)
Supplementary Cap	$ 6,000	$ 57,000
Leachate Collection System	1,200	16,000
Off-Site Leachate Treatment	57,000(1)	537,800
Groundwater Monitoring Program (Sampling and Analysis)	85,000(2) 16,000(3)	271,000
Total	$149,200(2) $ 80,200(3)	$881,800

(1) or $36,800 if on-site treatment is utilized

(2) for the first two years

(3) for years 3 through 30

Since this site is a municipally-owned and operated facility, cost sharing for project construction as well as the RI/FS and remedial design costs retroactively is 50% federal and 50% state. The O&M activities will be considered part of the approved action and eligible for Superfund monies for a period not to exceed one year after the completion of construction. Following that year, the State of New York will be responsible for funding and effectively operating and maintaining the implemented remedy.

SCHEDULE*

Activity	Date
- Public Meeting	June 15, 1987
- Regional Administrator Signs Record of Decision	July 27, 1987
- 60 Day Enforcement Moratorium **	September 1987 to November 1987
If no PRP pick-up, then:	
- Contractor Procurement Process for Remedial Design	September 1987 to January 1988
- Remedial Design to Include Treatability Studies Begins	February 1988
- Potential PRP Negotiations Completion	July 1988
- Contractore Procurement Process for Construction	July 1988 to November 1988
- Implement Remedy	December 1988
- Construction Complete	June 1990

* This is a projected schedule for this site and it is therefore subject to future modification.

** If a "good faith" offer by the PRPs is made within the 60 days, the enforcement moratorium would be extended an additional 60 days.

FUTURE ACTIONS

This ROD addresses the source control operable unit, which involves containing the source of contamination at the landfill, to prevent future contaminant migration.

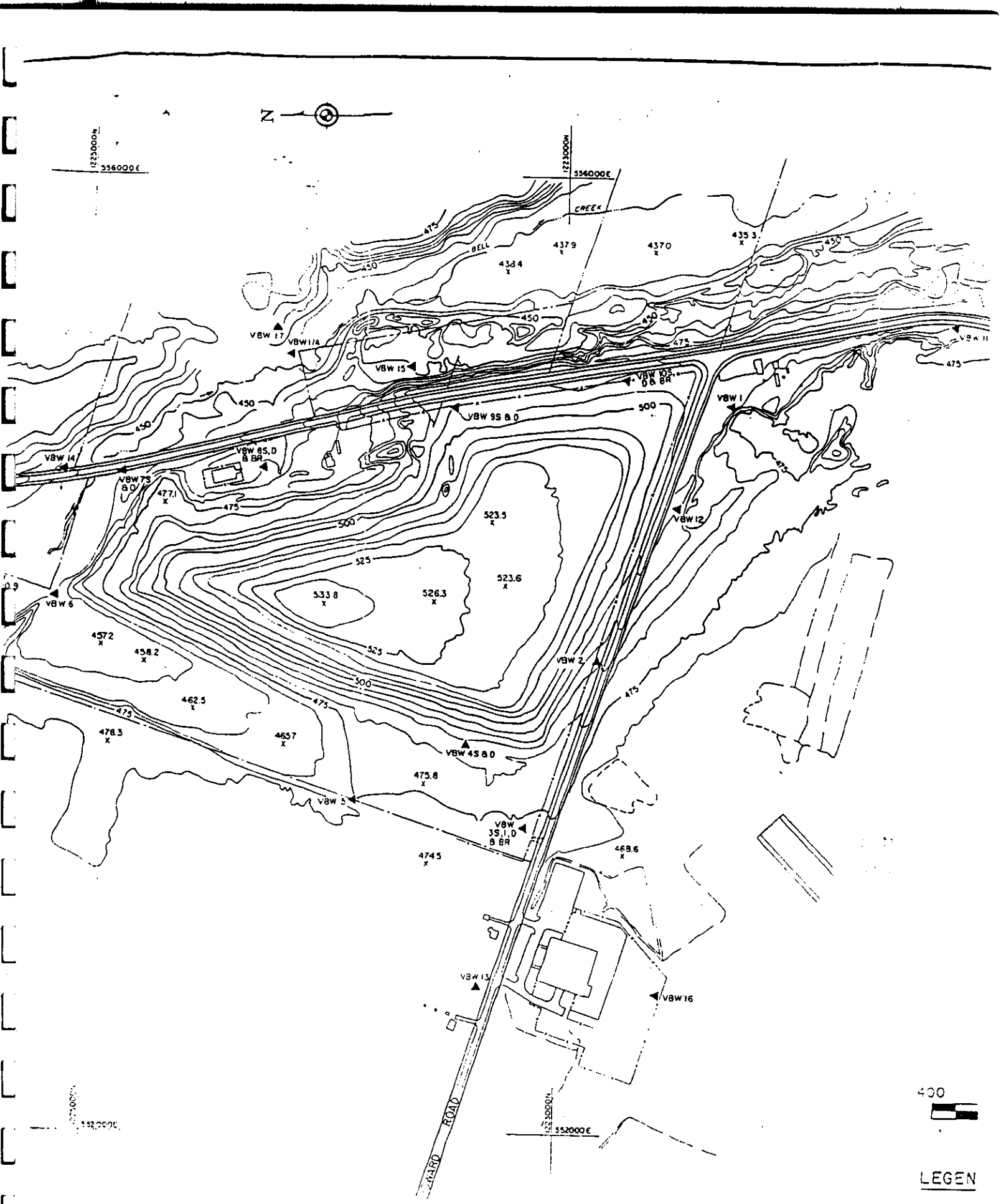
Certain objectives were identified as falling beyond the scope of the present RI/FS. These included evaluation of shallow and bedrock contamination and assessment of the site's impact upon the stream/wetland system adjacent to and downstream from the landfill. A second operable unit contamination pathways RI/FS will be conducted at the site to address both of the above-mentioned areas.

The evaluation of possible shallow and bedrock contamination from the landfill in which the extent of groundwater contamination from the site in both horizontal and vertical directions will be addressed as part of the supplemental RI/FS. In addition, it will be necessary to perform a residential well survey for the purpose of establishing existing downgradient wells (beyond those in the immediate vicinity of the landfill which were surveyed by previous investigators), which can be used to track, if feasible, the leading edge of a groundwater contaminant plume. It is anticipated that, in addition to existing residential wells, some new bedrock and shallow overburden wells will have to be installed at various locations downgradient from the site.

An environmental assessment of the stream/wetland systems along Bell and Black Creeks will also be performed in order to assess the Volney Landfill's impact upon these ecosystems. As indicated previously in this ROD, surface water contamination levels within these streams are generally low, but sediment contamination occurs at significantly higher levels. The environmental assessment will address the site's specific impact upon these water bodies and will include an asessment of risk associated with surface water/sediment contamination.

A cultural resources evaluation will be performed during the remedial design phase of the source control operable unit to determine if any historical landmarks or additional cultural resources exist within the undisturbed portions of the Volney Landfill site area. In addition, should the treatability studies determine that on-site leachate treatment should be utilized, a floodplain assessment would be performed during the remedial design phase to determine the impact this treatment system may have on the 100 year floodplain, and the impact the 100 year floodplain may have on the treatment system.

Surface and groundwater ARARs will also be addressed during this subsequent operable unit. If the findings from the supplemental RI/FS determine that additional remedial action is necessary, a ROD will be prepared for approval of future remedial action.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