Department of Environmental Conservation

Division of Hazardous Waste Remediation

Town of Northeast Landfill

Site Number 314048
Dutchess County, New York

Record of Decision

September 1995

Funded Under Title 3
of the
1986 Environmental Quality Bond Act

New York State Department of Environmental Conservation
GEORGE E. PATAKI, *Governor* MICHAEL D. ZAGATA, *Commissioner*

DECLARATION STATEMENT - RECORD OF DECISION

Town of Northeast Landfill Inactive Hazardous Waste Site
Town of Northeast, Dutchess County, New York
Site No. 314048

Statement of Purpose and Basis

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

This decision is based upon the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for the Town of Northeast Landfill Inactive Hazardous Waste Site and upon public input to the Proposed Remedial Action Plan (PRAP) presented by the NYSDEC. A bibliography of the documents included as a part of the Administrative Record is included in Appendix B of the ROD.

Assessment of the Site

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

Description of Selected Remedy

Based upon the results of the Remedial Investigation/Feasibility Study (RI/FS) for the Town of Northeast Landfill and the criteria identified for evaluation of alternatives the NYSDEC has selected regrading, a landfill cap that will meet 6NYCRR Part 360 Regulations, posting and fencing the property, deed restrictions, long-term monitoring with periodic reviews, and the remediation of sediments and wetland restoration in the seep area northeast of the landfill. The components of the remedy are as follows:

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

- *Regrading the landfill with the placement of approximately 70,000 cubic yards of clean fill or Alternate Grading Materials consisting of processed construction and demolition debris;*

- *Installation of a cap over the landfill that meets NYSDEC Part 360 standards;*

- *Fencing, posting, and deed restrictions that prohibit the use of onsite groundwater and intrusive activities;*

- *Sediment remediation with wetland restoration in the seep area northeast of the landfill;*

- *Long-term monitoring and maintenance with periodic reviews.*

New York State Department of Health Acceptance

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

Declaration

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

Since the remedy results in hazardous waste remaining within the landfill, a long-term monitoring program will be instituted. This long-term monitoring program will allow the effectiveness of the remedy to be monitored by sampling and testing of the groundwater and surface water.

9/25/97

Date

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

TABLE OF CONTENTS

RECORD OF DECISION

Town of Northeast Landfill
Town of Northeast, Dutchess County, New York
Site No. 314048
September 1995

SECTION 1: SITE DESCRIPTION

The Town of Northeast Landfill, NYSDEC Site No. 314048, is an approximately 15-acre landfill located on Regan Road in the Town of Northeast, in northeastern Dutchess County. The site is bordered by Regan Road on the south, an abandoned railroad grade on the west, and NYSDEC regulated Wetland MT-26 on the north and east. The site is located within the Coleman Station National Historic Register District.

The landfill is situated at the southern end of a relatively long and wide valley. Unnamed tributaries to the Webatuck Creek flow to the northeast both south and north of the site. The unnamed tributaries join with the southeast flowing Webatuck Creek approximately 2,000 feet northeast of the site (Figure 1).

SECTION 2: SITE HISTORY

2.1: Operational/Disposal History

May 1962	"Kimball Gravel Bank" Property acquired by the Town of Northeast
June 1963	Town began using the site for the disposal of municipal waste.
Jan. 1969 to Dec. 1971	Records indicate the site received waste solvents from K&E Plant in Millerton.
Dec. 1989	Landfill gates closed

2.2: Remedial History

1983	Landfill site added to NYSDEC Inactive Hazardous Waste Registry Phase I Investigation Completed

1984 Phase II Investigation completed - Site reclassified from a Class 2a to a Class 2.

Aug. 1991 Order on Consent requiring remedial program executed by Town, K&E, and State.

SECTION 3: CURRENT STATUS

3.1: Summary of the Remedial Investigation

The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site.

The majority of the RI field work was conducted between October and December of 1993, with supplemental sampling work performed in the spring and summer of 1994. A report entitled "Remedial Investigation at the Northeast Landfill", October 1994, has been prepared describing the field activities and findings of the RI in detail.

The RI activities consisted of the following:

- Historic Record Search
- Community Well Survey
- Perimeter Explosive Gas Survey
- Soil Gas Survey
- Test Trenching
- Subsurface Drilling Program
- Monitoring Well and Piezometer Installation
- Hydrogeologic Testing and Monitoring
- Groundwater, Surface Water, & Sediment Sampling and Analysis
- Ambient Air Sampling
- Subsurface Soil, Waste, Leachate & Landfill Gas Sampling
- Fish & Wildlife Impact Analysis.

To determine which media (soil, groundwater, etc.) contain contamination at levels of concern, the analytical data obtained from the RI was compared to environmental Standards, Criteria, and Guidance (SCGs). Groundwater, drinking water and surface water SCGs identified for the Northeast Landfill were based on NYSDEC Ambient Water Quality Standards and Guidance Values and Part V of NYS Sanitary Code. For the evaluation and interpretation of soil and sediment analytical results, NYSDEC soil cleanup guidelines for the protection of groundwater, background conditions, and risk-based remediation criteria were used to develop remediation goals for soil.

Based upon the results of the remedial investigation in comparison to the SCGs and potential public health and environmental exposure routes, certain areas and media of the site require remediation. These are summarized below. More complete information can be found in the RI Report.

Chemical concentrations are reported in parts per billion (ppb) or parts per million (ppm). For comparison purposes, SCGs are given for each medium.

Based on historical information and the results of the soil gas survey, four areas were identified at the site where industrial waste was most concentrated. These areas coincide with the locations of piezometers B-1 through B-4 and are identified on Figure 2 as the former sludge burial area, a potential industrial waste disposal area, the former burn pit area, and the possible former lagoon area, respectively. Soil gas results indicated the highest levels of volatile organic compounds (VOCs) in the former burn pit area and the former sludge burial area. Red iron staining on the ground surface is visible in several locations around the landfill.

VOCs were detected in 5 of the 8 subsurface soil samples collected for analysis at monitoring well and piezometer locations, ranging from 3 ppb at MW-2 to 9,736 ppb at B-5. Semivolatile organic compounds were detected at each location, with highest concentrations detected at B-5.

Samples of surface water and sediments were obtained at various locations around the site (Figure 2). Other than a hit of 11 ppb of MEK (2-Butanone) in SW-2 and 2 ppb of bis-phthalate in SW-7, no volatile or semivolatile compounds were detected in surface water. Iron was detected in surface water above background concentrations in SW-1 and SW-2 on the east side of the landfill. Trace levels of mercury were detected in SW-2 and SW-7, 0.86 ppb and 0.28 ppb respectively, slightly exceeding the surface water standard of 0.2 ppb.

Analyical results of sediment samples SED-1, and SED-7 through SED-10, taken in the seep area northeast of the landfill, indicated concentrations of arsenic, cadmium, chromium, iron, lead, manganese, and mercury that exceed fish and wildlife sediment criteria.

The unconsolidated deposits and the upper portion of the bedrock were investigated to depths up to 103 feet. Generally, the following six stratigraphic units were identified:

Fill - municipal and industrial waste in a matrix of sand and silt with a trace of gravel, from 0 to 25 feet thick.

Sand & Gravel - Sand and Gravel with variable silt content and little stratification ranging up to 64 feet thick and becoming finer to the east.

Clayey Sandy Silt - Stratified clayey, sandy silt, ranging from 55 feet thick east of the landfill to less that 1 foot southwest of the landfill. Observed southwest of the site and a depth of 75 feet; 16 feet thick gravel glacial till deposit.

Bedrock - gray Stockbridge limestone - weathered surface ranged from 51 feet to 90.5 feet below grade level

Groundwater flow in the site vicinity is generally to the northeast in the shallow unconfined aquifer, deeper intermediate zone of the unconfined aquifer and in the bedrock aquifer. Measurements from shallow groundwater wells indicate some radial flow from groundwater mounding, especially along the eastern margin of the landfill. The tendency for groundwater mounding to be more pronounced in the eastern portion of the landfill may reflect the lower permeability of the underlying sediments. A comparison of shallow and bedrock water levels indicates that the unconfined and bedrock aquifers are nearly at equilibrium along the west side of the landfill, but there is a large upward vertical gradient on the east side of the landfill. This indicates that these aquifers discharge to Wetland MT-26 and the Webatuck Creek further east.

Analytical groundwater sampling indicated only traces of volatile organic contaminates in the shallow groundwater around the landfill, except for the second round spring sample in well MW-01, located on the east side of the landfill, which showed 1,583 ppb of total volatile organic compounds - mostly MEK and acetone (Figure 3). Analytical results from samples taken from well MW-01 when it was installed in July 1984 indicated 56,000 ppb of MEK and 42,000 ppb of acetone, as well as several other volatile organic compounds.

Low levels of pesticides were also detected at various locations in and around the landfill. The highest concentration of pesticides in groundwater was 0.46 ppb at upgradient location MW-4s. This low level of pesticide in the shallow groundwater is probably not attributable to the landfill, but may be due to previous agricultural activities in the area. It is difficult to determine the impact of inorganic compounds (metals) on groundwater quality since the deep and shallow groundwater has relatively high concentrations of naturally occuring metals, although concentrations of iron and manganese appear to be elevated above background in the shallow groundwater east of the landfill (Figure 4). The strong upward vertical gradient in deeper strata east of the landfill should minimize the downward movement of contaminates. Although groundwater quality indicator results show elevated levels of total dissolved solids in the shallow, intermediate and deep wells at the MW-2 location, analytical results indicate that the deep bedrock aquifer has not been impacted by the landfill. Analysis of air samples and landfill gas emissions indicate that airborne contaminants are not significant at this site as all compounds detected in landfill gas fall within acceptable limits by an order of magnitude or more.

A synthesis of all data collected during the RI indicates two primary environmental concerns - volatile organic compounds present in the shallow groundwater downgradient of the landfill and elevated metals concentrations in landfill soils and sediments in the seep area northeast of the landfill.

It should be noted, however, that the data collected during the RI represents a "snap shot" of landfills conditions. It is known from K&E reports, landfill records and statements from former landfill workers that the K&E plant in Millerton generated approximately 1,000 gallons per week of waste solvents. MEK and acetone are compounds which were included in the mixture of solvents generated by K&E and disposed of at the landfill from 1969 to 1971. Given the size of the landfill, the analytical results obtained may not reflect the highest concentrations of contamination that may exist at the landfill, nor can the RI determine what future releases there may be if the landfill were left unremediated.

3.2 Summary of Human Exposure Pathways:

This section describes the types of human exposures that may present added health risks to persons at or around the site. A more detailed discussion of the health risks can be found in Section 6 of the RI Report.

An exposure pathway is the process by which an individual comes into contact with a contaminant. The five elements of an exposure pathway are 1) the source of contamination; 2) the environmental medium and transport mechanisms; 3) the point of exposure; 4) the route of exposure; and 5) the receptor population. These elements of an exposure pathway may be based on past, present, or future events.

Possible complete human exposure pathways associated with the Northeast Landfill include:

1.) Current and future ingestion and household use of groundwater by nearby residents;

2.) Skin contact or inadvertent ingestion of surface water or sediments;

3.) Inhalation of volatile air contaminants.

The risk evaluation summarized in Section 6 of the RI Report demonstrated that under current land use scenario, noncarcinogenic and carcinogenic chemicals pose no unacceptable threat to the population (i.e. residents and trespassers). The total sitewide hazard indices are less than 1 and the sitewide carcinogenic risks lie within or below the range of acceptability established by the National Contingency Plan (NCP).

There is very little potential for human consumption of groundwater impacted by the landfill since groundwater flows to the northeast toward designated wetlands which will not be developed in the future. Many contaminates in groundwater are naturally attenuated, dispersed, and broken down in wetland environments.

Nearby residents or others trespassing onsite for recreational purposes (i.e. hunting, hiking, or ATV riding) could be exposed to surface soil, surface water or sediment, but carcinogenic and noncarcinogenic health effects from exposure to contaminates in these media through these activities is negligible.

Summary of Environmental Exposure Pathways:

This section summarizes the types of environmental exposures which may be presented by the site. The Habitat Based Assessment included in the RI presents a more detailed discussion of the potential impacts from the site to fish and wildlife resources. Freshwater Wetland MT-26, the Webatuck Creek riverine habitat, and surrounding upland areas are ecosystems that could potentially be impacted be the landfill. The 112 acre Freshwater Wetland MT-26 qualifies as a Class I designated wetland since the endangered bog turtle has been sighted within the wetland. The Webatuck Creek is a class C(T) stream which flows from north to south 1,000 feet northeast of the landfill through MT-26.

The impact to MT-26 from the landfill appears to be limited to the seep area northeast of the landfill, and to a much lesser extent the seep area on the southeast side of the site.

Analytical results of sediment samples in the seep area northeast of the landfill indicate elevated concentrations of arsenic, cadmium, chromium, iron, lead, manganese, and mercury that exceed levels that are known to be protective of fish and wildlife. This impacted area has been delineated by DEC and is shown on Figure 4.

Hazard Quotients calculated for wildlife exposure to each of the site contaminants of potential concern indicate potential chronic toxic effects for the meadow jumping mouse from arsenic and manganese in the localized area of the seep northeast of the landfill.

SECTION 4: ENFORCEMENT STATUS

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators, and haulers. Two PRPs have been identified - the Town of Northeast who owns and operated the landfill, and Keuffel & Esser Company (K&E), who operated an industrial facility in the Village of Millerton and generated hazardous waste which was disposed of at the landfill.

The NYSDEC, K&E, and the Town of Northeast entered into a Consent Order on August 13, 1991. The Order obligates the Town to implement a full remedial program, requires K&E to pay 50% of the RI/FS costs, and allows reimbursement to the Town of up to 75 percent of the eligible cost of their share of the remedial program. There will be additional negotiations with K&E to determine their share of the remedy's design and construction costs. The Town and K&E have also entered into a separate agreement entitled "The Northeast Landfill Fund Agreement", which establishes a Northeast Landfill Remedial Fund to pay for covered costs and establishes procedures for payment of RI/FS costs.

The following is the enforcement history of this site.

Order on Consent

Date	Index	Subject
8/13/91	**W3-0181-87-12**	**Remedial Program**

SECTION 5: SUMMARY OF THE REMEDIATION GOALS

Goals for the remedial program have been established through the remedy selection process stated in 6NYCRR Part 375-1.10. These goals are established under the overall goal of meeting all standard, criteria, and guidance (SCGs) and protecting human health and the environment.

At a minimum, the remedy selected should eliminate or mitigate all significant threats to the public health and to the environment presented by the hazardous waste disposed at the site through the proper application of scientific and engineering principles.

The goals selected for this site are:

- *Reduce, control, or eliminate the contamination present within the soils/waste on site (generation of leachate within the fill mass).*
- *Eliminate the threat to surface waters by eliminating any future contaminated surface run-off from the contaminated soils on site.*
- *Eliminate the potential for direct human or animal contact with the contaminated soils and sediments on site.*
- *Mitigate the impacts of contaminated groundwater to the environment.*
- *Prevent, to the extent possible, migration of contaminants in the landfill to groundwater.*
- *Provide for attainment of SCGs for groundwater quality at the limits of the area of concern (AOC).*

SECTION 6: SUMMARY OF THE EVALUATION OF ALTERNATIVES

Potential remedial alternatives for the Northeast Landfill site were identified, screened and evaluated in a Feasibility Study. This evaluation is presented in the report entitled Final Feasibility Study at the Northeast Landfill, June 1995. A summary of the detailed analysis follows.

6.1: Description of Alternatives

The potential remedies are intended to address the contaminated soils, sediments, surface water and groundwater at the site.

Alternative 1- No Action

The no action alternative is evaluated as a procedural requirement and as a basis for comparison. It requires continued monitoring only, allowing the site to remain in an unremediated state.

Under this alternative the site would remain in its present condition and human health and the environment would not be provided any additional protection.

Alternative 2- Institutional Action

Present Worth:	$ 1,346,724
Capital Cost:	$ 75,300
Annual O&M:	$ 92,400
Time to Implement	6 months

This alternative includes posting and fencing the property, deed restrictions, and long-term monitoring with periodic reviews.

Alternative 3- Part 360 Cap, Sediment Remediation

Present Worth:	$ 4,595,300
Capital Cost:	$ 4,062,800
Annual O&M:	$ 38,700
Time to Implement	6 months - 1 year

This alternative includes posting and fencing the property, deed restrictions, and long-term monitoring with periodic reviews, a landfill cap that would meet 6NYCRR Part 360 Regulations, and the remediation of sediments and wetland restoration in the seep area northeast of the landfill.

Alternative 4- Part 360 Cap, Sediment Remediation, Soil Vapor Extraction with Air Sparging

Present Worth:	$ 6,096,900
Capital Cost:	$ 5,101,800
Annual O&M:	$ 38,700
Time to Implement	6 months - 1 year

This alternative includes posting and fencing the property, deed restrictions, and long-term monitoring with five-year reviews, a landfill cap that would meet 6NYCRR Part 360 Regulations, the remediation of sediments and wetland restoration in the seep area northeast of the landfill, and soil vapor extraction with air sparging. The vapor extraction/air sparging system would consist of air injection wells and vapor extraction wells connected by pipes to a vacuum and treatment system. VOC's are withdrawn from the subsurface and treated before release to the atmosphere. As is noted on Table 1, this alternative would have an additonal O&M cost for the first three years of operation of $154,200.

Alternative 5- Part 360 Cap, Sediment Remediation, Localized Groundwater Collection with Onsite Treatment

Present Worth:	$ 7,726,000
Capital Cost:	$ 5,320,800
Annual O&M:	$ 174,780
Time to Implement	6 months - 1 year

This alternative includes posting and fencing the property, deed restrictions, and long-term monitoring with periodic reviews, a landfill cap that would meet 6NYCRR Part 360 Regulations, the remediation of sediments and wetland restoration in the seep area northeast of the landfill, and collection of groundwater via a 500 foot long trench on the eastern side of the landfill with onsite treatment and discharge. Wells within the trench would draw the water down to capture contaminants from the shallow portion of the water table.

Alternative 6 - Part 360 Cap, Sediment Remediation, Downgradient Perimeter Groundwater Collection with Onsite Treatment

Present Worth:	$ 12,170,621
Capital Cost:	$ 7,222,800
Annual O&M:	$ 359,580
Time to Implement	6 months - 1 year

This alternative includes posting and fencing the property, deed restrictions, and long-term monitoring with periodic reviews, a landfill cap that would meet 6NYCRR Part 360 Regulations, the remediation of sediments and wetland restoration in the seep area northeast of the landfill, and collection of groundwater via a 1200 foot long trench on the eastern and nothern side of the landfill with onsite treatment and discharge. Wells within the trench would draw the water down to capture contaminants from the shallow portion of the water table.

6.2 Evaluation of Remedial Alternatives

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

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

1. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether or not a remedy will meet applicable environmental laws, regulations, standards, and guidance.

   Alternatives 1 and 2 do not meet SCGs. Alternative 3 does not comply with all groundwater SCGs, but it is projected that groundwater SCGs would be met at the nearest potential future groundwater receptor. With Alternatives 4, 5 and 6 SCGs with respect to the landfill would be met. It should be noted, however, that the natural background groundwater contains certain metals, such as iron, in concentations that may be higher than the New York State SCG.

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

Alternative 1 does not satisfy the remedial action objectives and is not protective of human health and the environment. The landfill would continue to contaminate groundwater and human access to contaminants would not be reduced. Alternative 2 includes measures to restrict human access to contaminants and therefore reduces the potential for human health risk, but does not include measures to address potential environmental risk. Alternative 2 does not satisfy the remedial action objectives and is not completely protective.

Alternatives 3 through 6 are protective as the human health risk and ecological risk would be eliminated, and they satisfy remedial action objectives for soil and sediments. Remedial action objectives for air would not apply since landfill emissions are not impacting the surrounding community and meet applicable air guidelines. Remedial action objectives for groundwater would be met upon completion of implementation for Alternative 4, and over the long-term for Alternatives 3, 5 and 6. There is no current or future human health risk posed by groundwater migrating to existing or potential downgradient receptors with the implementation of alternatives 3 through 6. Remedial action objectives at the nearest potential downgradient receptor would be met following capping for Alternatives 3 through 6.

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

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

Alternative 1 has no impact on the community, onsite workers, or the environment. Alternative 2 has little impact on onsite workers. During the construction period for Alternatives 3 through 6, short-term impacts to the community, onsite workers, and the environment would exist from various pathways. These impacts would have to be mitigated through controls including appropriate health and safety measures. Alternative 3, which includes the least construction, would have the least short-term impacts, followed by Alternative 5, Alternative 4 and finally Alternative 6 which includes construction of the longer collection trench.

Remedial action objectives for soil and sediments would be met upon completion of construction for Alternatives 3, 5, and 6. The groundwater objective to meet SCGs immediately downgradient of the landfill would be met as the water table is lowered, anticipated to take two to five years, and following that, through natural processes which would dilute and degrade the contaminants over the long-term for Alternatives 5 and 6. Groundwater SCGs would be met at the nearest potential future downgradient receptor for Alternative 3 following capping. Alternative 4 would meet objectives at the site boundary for all media in four years if the treatment proposed was fully effective. Alternatives 5 and 6 would meet the groundwater objective over the long-term when monitoring results indicate that collection is no longer needed to meet SCGs.

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

   Alternative 1 does not reduce risk at the site and is not an effective or permanent remedy. Alternative 2 relies on access restrictions to reduce potential human health risk. Alternatives 3 through 6 equally reduce the potential for risks to human health and the environment for soil, sediments, and air. The potential risks from contaminants migrating through the shallow portion of the water table aquifer would be reduced following construction of the landfill cap and lowering of the water table in the eastern portion of the site. Long-term monitoring would be used in the review(s) to determine if remedial measures are protecting human health and the environment. Alternative 3 relies on natural processes (degradation, dispersion, biodegradation) and the influence of the cap to reduce contaminant migration through the groundwater. Implementation of a Part 360 cap would lower the non-springtime water table to below the waste, and to within 0.5 feet of the bottom of the waste in the area of boring B-2 during seasonally-high spring-time conditions. Alternative 4 includes VOC collection from subsurface soils and treatment to enhance groundwater remediation. Alternatives 5 and 6 include groundwater collection and treatment to reduce or eliminate, respectively, offsite contaminant migration through the shallow portion of the water table aquifer.

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

   Alternatives 1 and 2 do not reduce toxicity, mobility or volume. Alternatives 3 through 6 would reduce the mobility of contaminants in soil, sediments, and groundwater following construction of a landfill cap and lowering of the water table. The toxicity of VOCs would be either reduced or destroyed with the soil vapor extraction and air sparging system (Alternative 4). The mobility and toxicity of contaminants in groundwater would be further reduced in Alternatives 5 and 6 (Alternative 6 more so than Alternative 5).

6. Implementability. The technical and administrative feasibility of implementing each alternative is evaluated. Technically, this includes the difficulties associated with the construction, the reliability of the technology, and the ability to monitor the effectiveness of the remedy. Administratively, the availability of the necessary personal and material is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, etc..

   Alternatives 1 and 2 are technically implementable. With the exception of the in-situ treatment technologies included in Alternative 4, the technologies proposed for Alternatives 3 through 6 are proven technologies that have been implemented at landfill sites. The availability of necessary materials and services should not pose a problem. Treatability studies would be required to determine the effectiveness of treatment proposed in Alternatives 4, 5, and 6. As the nature of fill is not completely known, difficulties could arise during excavation for the collection trenches (in Alternatives 5 and 6) and the landfill cap. Due to the presence of adjacent wetlands, the endangered bog turtle, and nearby significant habitat, mitigative measures for sediment

remediation are included. Air sparging and soil vapor extraction, included in Alternative 4, are technologies which would require pilot studies in order to determine their effectiveness on the contaminants present at the site prior to implementation.

7. Cost. Capital and operation and maintenance costs are estimated for each alternative and compared on a present worth basis. Although cost is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the remaining criteria, cost effectiveness can be used as the basis for the final decision. The costs for each alternative are presented in Table 1.

   Alternatives 1 and 2 are relatively low in cost, but would not be effective in protecting human health and the environment over the long-term. Alternatives 3 through 6, which all include a Part 360 cap and sediment remediation, are effective in providing long-term protection to human health and the environment.

8. **Community Acceptance** - This final criterion is considered a modifying criterion and is taken into account after evaluating those above. It is focused upon after public comments on the Proposed Remedial Action Plan have been received. Concerns of the community regarding the RI/FS reports and the Proposed Remedial Action Plan have been evaluated. A "Responsiveness Summary" was prepared that describes public comments received and how the Department will address the concerns raised (Appendix A).

SECTION 7: SUMMARY OF THE PREFERRED REMEDY

Based upon the results of the RI/FS, and the evaluation presented in Section 7, the NYSDEC has selected Alternative 3 as the remedy for this site.

Alternative 3 was the selected remedy for the North East Landfill because it is protective of human health and the environment. Groundwater SCGs are met at current and potential future downgradient groundwater receptors. Deed restrictions will preclude exposure to onsite groundwater and fencing would protect the integrity of the cap. Other factors which favor the selection of Alternative 3 include that it is easier to implement, poses less short-term impacts, and is more cost-effective than other alternatives that meet SCGs.

From the bottom to the top the Part 360 cap would consist of 6 inches of grading fill, a gas collection layer with a geotextile on steeper perimeter slopes, a clay or geomembrane barrier layer, a soil barrier protection layer, 6 inches of topsoil, and a vegetative cover. There will be one methane gas vent backfilled with stone per acre. Some regrading will be necessary to meet a maximum slope on the landfill of 33% and a minimum slope of 4%, in accordance with Part 360 regulations. Approximately 70,000 cubic yards of clean fill would be required in preparing the subgrade. Alternative Grading Material (AGM) may be used in preparing the subgrade if determined to be available during the remedial design phase. AGM is processed construction and demolition debris. The use of Alternative Grading Material (AGM) to achieve proper grade is an acceptable approach which has been used successfully at other sites. The use of AGM would require the preparation and Department acceptance of an AGM Program Operations Plan in order to ensure that the AGM would be of a select and uncontaminated nature, the AGM would be properly placed and compacted, and the AGM would meet all State and local

requirements. In order to solicit public comments and concerns, a public availability session would be held prior to the Department's determination of the acceptability of the AGM Program Operations Plan.

Installation of a Part 360 cap will eliminate approximately 85 percent of the infiltration which is currently contributing to leaching of VOCs into shallow groundwater. Further, the cap will lower the water table below the waste over all but a small area where groundwater mounding is evident during springtime conditions. Reduced infiltration and a lowered water table will substantially reduce contaminant migration from the landfill such that groundwater SCGs will be met at the nearest potential future groundwater receptor.

Sediment remediation will eliminate the potential ecological risk which is present at the site. Due to the limited area of sediments to be remediated (approximately 0.2 acres), and the objective to minimize impacts on the wetlands, large equipment excavation methods would not be appropriate at this site. Contaminated sediments (up to about 300 cubic yards), will be transported, deposited, graded, and spread on the landfill for drying prior to landfill cap construction. A berm may have to be constructed to control runoff. Appropriate hydrophilic soils will then be placed in the wetland and plant species will be introduced by seed or live transplants to promote growth of species already adapted to the area. The actual sediment removal and restoration methods will be determined during remedial design.

The estimated present worth cost to implement the remedy is $4,595,300. The cost to construct the remedy is estimated to be $4,062,800 and the estimated average annual operation and maintenance cost for 30 years is $38,700.

The elements of the selected remedy are as follows:

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

2. A remedial construction program consisting of the following:

- Regrading the landfill with the placement of approximately 70,000 cubic yards of clean fill or AGM;

- Installation of a cap over the landfill that meets NYSDEC Part 360 standards;

- Fencing, posting, and deed restrictions that prohibit the use of onsite groundwater and intrusive activites;

- Sediment remediation with wetland restoration in the seep area northeast of the landfill;

- Long-term monitoring and maintenance with periodic reviews.

SECTION 8: Highlights of Community Participation

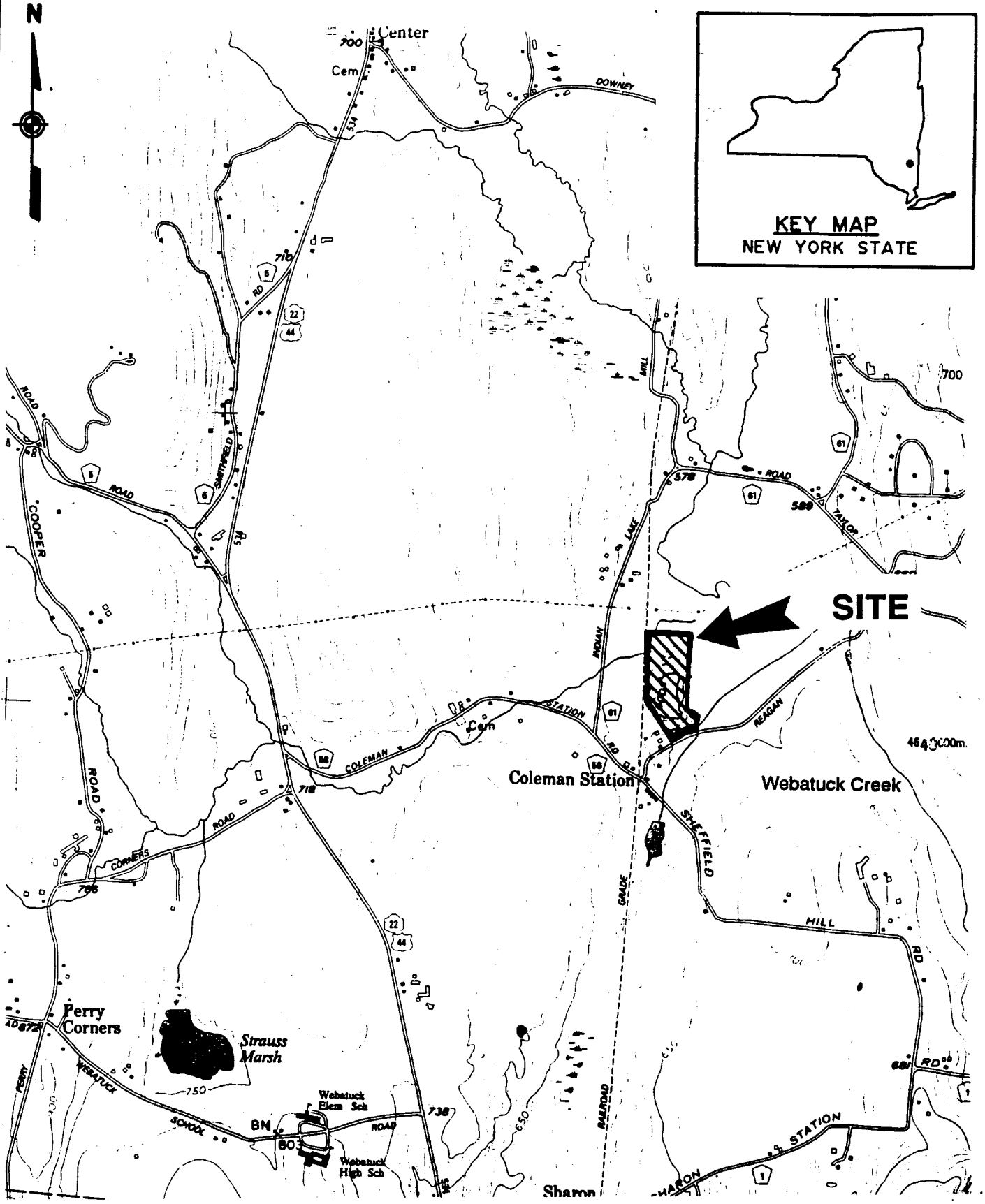
The first public meeting on the Remedial Program was held on May 18, 1993 at the Grange Hall in Millerton, New York. The proposed Remedial Investigation/Feasibility Study (RI/FS) was presented to the public, and public comments received at the meeting and during a 30-day public comment period were addressed in a document entitled "Responsiveness Summary for the Public Comments on the Proposed Remedial Investigation/Feasibility Study at the Northeast Landfill," prepared by URS Consultants, Inc., dated September 1993. The ongoing RI/FS was periodically discussed and occasional updates were provided at Town Board Meetings.

The public comment period on the Proposed Remedial Action Plan (PRAP) was held from August 7, 1995 to September 6, 1995. The PRAP public meeting was held on August 24, 1995 at the Northeast Town Hall. A public notice was issued, and mailed out to members of the press and interested parties annoucing the public comment period and second public meeting.

All final reports were placed in the document repositories and made available to the public for review. The public meeting on the PRAP and the comments received during the public comment period are summarized in the Responsiveness Summary Section of this document, Appendix A. The remedy presented in this Record of Decision is the same remedy as was proposed in the PRAP, except that it allows for the option of clay or a flexible membrane liner (FML) as the barrier layer in the cap based on public comments received.

FIGURES

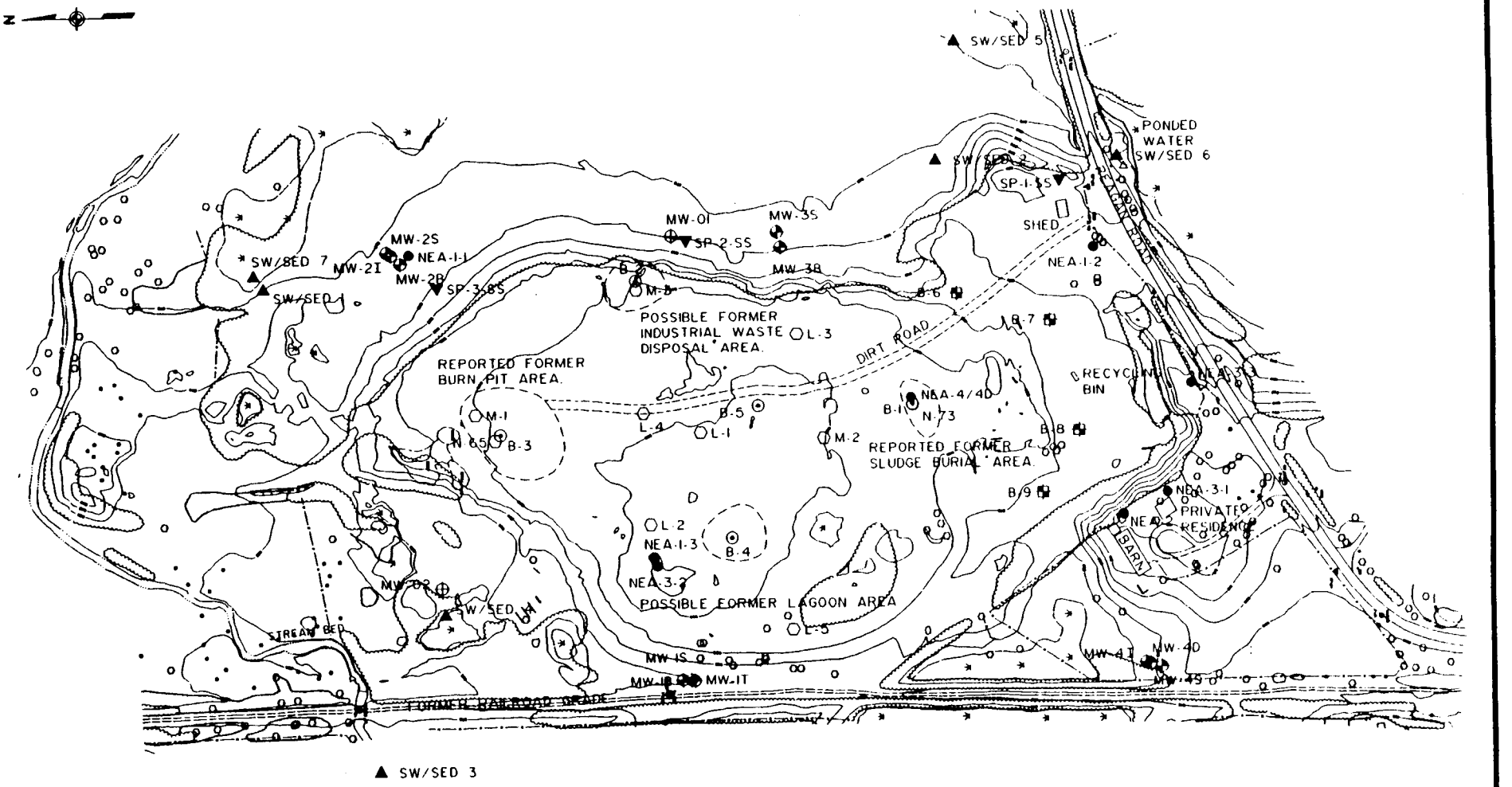
\0535319.00\ 10/4/94-1 FAO



SOURCE:
USGS 7.5 MINUTE SERIES QUADRANGLE
MILLERTON, NY - CONNECTICUT, 1988

AH-6380

URS CONSULTANTS, INC.	NORTH EAST LANDFILL SITE LOCATION MAP	FIGURE 1



NOTES

1. BASE MAPPING WAS PREPARED BY AIR SURVEY CORP., RESTON, VA USING AERIAL PHOTOGRAPHY TAKEN APRIL 14, 1993. GROUND CONTROL WAS BY URS.
2. PROJECT VERTICAL CONTROL IS BASED UPON NATIONAL GEODETIC VERTICAL DATUM OF 1929 AS ESTABLISHED ON USGS MONUMENT ALBANY 573" ELEV. 575.540

LEGEND

- RI MONITORING WELL (1993)
- RI PIEZOMETER (1993)
- RI SOIL BORING (1994)
- AMBIENT AIR SAMPLE LOCATION
- GAS EMISSIONS SAMPLE POINTS
- NYSDEC PHASE II MONITORING WELL (1984)
- SURFACE/WATER SEDIMENT SAMPLE (1993, 1994)
- SURFACE SOIL SAMPLE POINTS

150 0 150
SCALE IN FEET

CONTOUR INTERVAL = 5 FEET

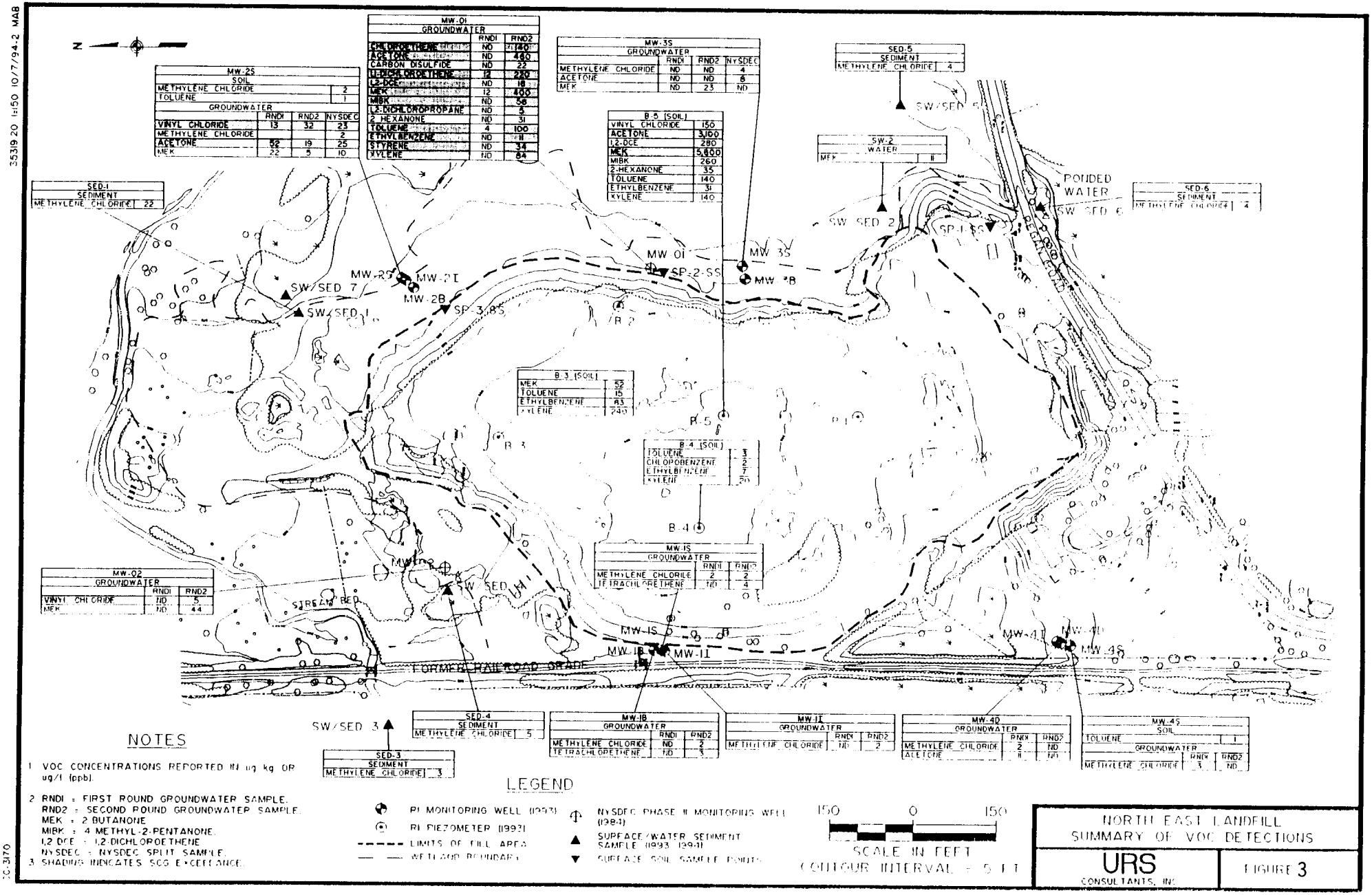
NORTH EAST LANDFILL
SITE PLAN AND SAMPLE LOCATION

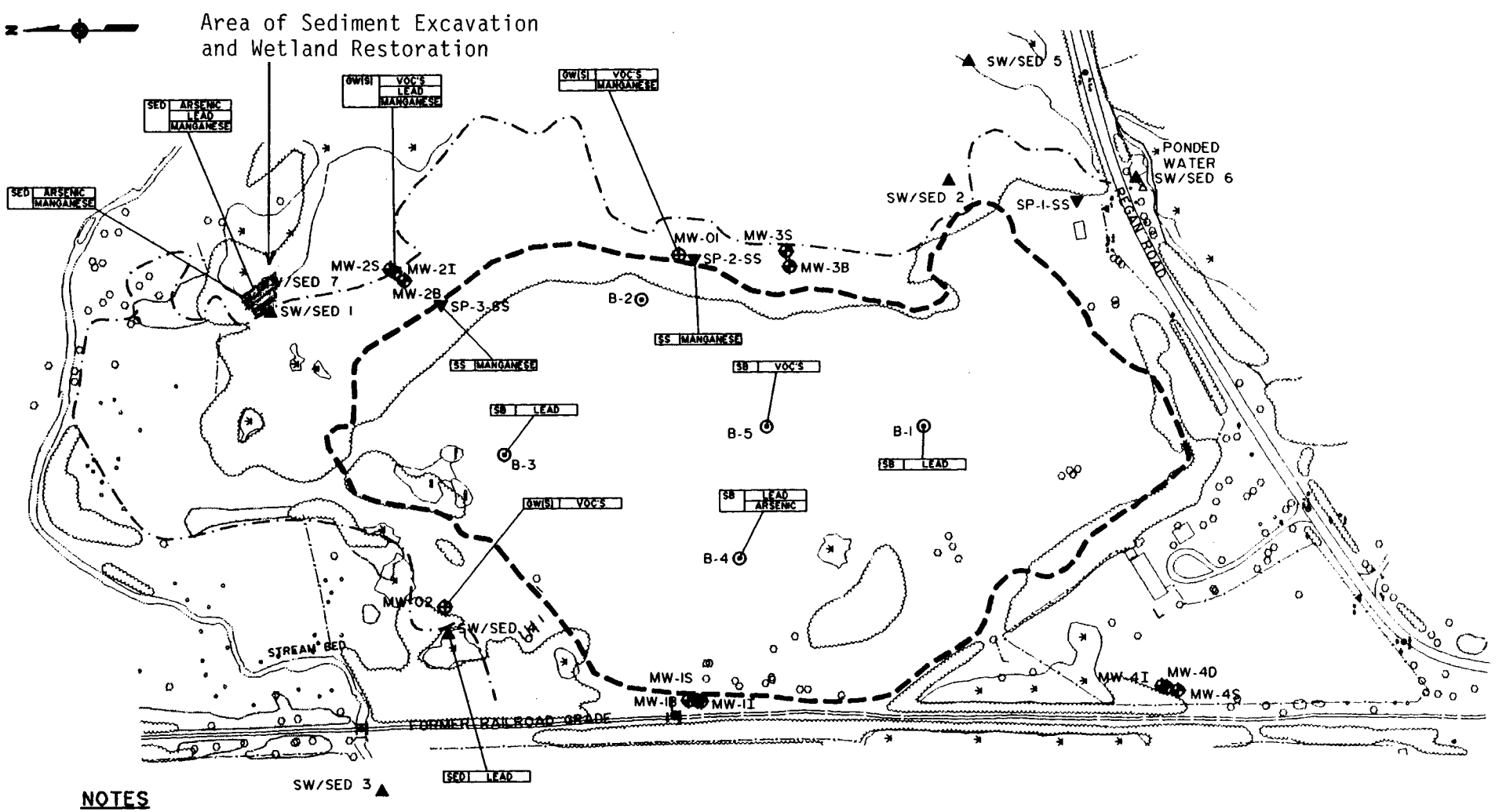
URS CONSULTANTS, INC.

FIGURE 2

35319.20 1:150 10/7/94:4 MAB

2787


MW-01
GROUNDWATER
RND1 RND2
CHLOROETHENE ND 140
ACETONE ND 460
CARBON DISULFIDE ND 22
1,1-DICHLOROETHENE 12 220
1,2-DCE ND 18
MEK 12 400
MIBK ND 58
1,2-DICHLOROPROPANE ND 5
2-HEXANONE ND 31
TOLUENE 4 100
ETHYLBENZENE ND 11
STYRENE ND 34
XYLENE ND 84
MW-3S
GROUNDWATER
RND1 RND2 NYSDEC
METHYLENE CHLORIDE ND ND 4
ACETONE ND ND 6
MEK ND 23 ND
SED-5
SEDIMENT
METHYLENE CHLORIDE 4
MW-2S
SOIL
METHYLENE CHLORIDE 2
TOLUENE 1
GROUNDWATER
RND1 RND2 NYSDEC
VINYL CHLORIDE 13 32 23
METHYLENE CHLORIDE 2
ACETONE 52 19 25
MEK 22 5 10
B-5 (SOIL)
VINYL CHLORIDE 150
ACETONE 3,100
1,2-DCE 280
MEK 5,800
MIBK 260
2-HEXANONE 35
TOLUENE 140
ETHYLBENZENE 31
XYLENE 140
SW-2
WATER
MEK 11
SED-1
SEDIMENT
METHYLENE CHLORIDE 22
SED-6
SEDIMENT
METHYLENE CHLORIDE 4
B-3 (SOIL)
MEK 52
TOLUENE 15
ETHYLBENZENE 83
XYLENE 240
B-4 (SOIL)
TOLUENE 3
CHLOROBENZENE 2
ETHYLBENZENE 7
XYLENE 20
MW-02
GROUNDWATER
RND1 RND2
VINYL CHLORIDE ND 5
MEK ND 44
MW-1S
GROUNDWATER
RND1 RND2
METHYLENE CHLORIDE 2 2
TETRACHLOROETHENE ND 4
SED-4
SEDIMENT
METHYLENE CHLORIDE 5
SED-3
SEDIMENT
METHYLENE CHLORIDE 3
MW-1B
GROUNDWATER
RND1 RND2
METHYLENE CHLORIDE ND 2
TETRACHLOROETHENE ND 3
MW-1I
GROUNDWATER
RND1 RND2
METHYLENE CHLORIDE ND 2
MW-4D
GROUNDWATER
RND1 RND2
METHYLENE CHLORIDE 2 ND
ACETONE 11 ND
MW-4S
SOIL
TOLUENE 1
GROUNDWATER
RND1 RND2
METHYLENE CHLORIDE 3 ND
MW 01
MW 3S
MW 2S
MW 2I
MW 2B
MW 1S
MW 1B
MW 1I
MW 4I
MW 4D
MW 4S
SP-1 SS
SP-2 SS
SP-3 SS
SW SED 1
SW SED 2
SW SED 3
SW SED 4
SW SED 5
SW SED 6
SW SED 7
B-1
B-2
B-3
B-4
B-5
STREAM BED
FORMER RAILROAD GRADE
PONDED WATER
NOTES
1. VOC CONCENTRATIONS REPORTED IN ug kg OR ug/l (ppb).
2. RND1 = FIRST ROUND GROUNDWATER SAMPLE.
RND2 = SECOND ROUND GROUNDWATER SAMPLE.
MEK = 2 BUTANONE
MIBK = 4 METHYL-2-PENTANONE
1,2 DCE = 1,2-DICHLOROETHENE
NYSDEC = NYSDEC SPLIT SAMPLE.
3. SHADING INDICATES SCG EXCEEDANCE.
LEGEND
RI MONITORING WELL (1993)
RI PIEZOMETER (1993)
LIMITS OF FILL AREA
WETLAND BOUNDARY
NYSDEC PHASE II MONITORING WELL (1984)
SURFACE WATER SEDIMENT SAMPLE (1993 1994)
SURFACE SOIL SAMPLE POINTS
150 0 150
SCALE IN FEET
CONTOUR INTERVAL = 5 FT
NORTH EAST LANDFILL
SUMMARY OF VOC DETECTIONS
URS CONSULTANTS, INC
FIGURE 3



NOTES

1. LANDFILL IMPACT PARAMETERS DETERMINED FROM SCG EXCEEDANCES AND POTENTIAL HEALTH RISKS TO HUMANS OR WILDLIFE.
2. ONLY PARAMETERS WHICH ARE ATTRIBUTABLE TO THE LANDFILL ARE INCLUDED.
3. SB = SUBSURFACE SOIL. SS = SURFACE SOIL. GW = GROUNDWATER. (S) = SHALLOW WATER TABLE AQUIFER. SED = SEDIMENT. VOC'S = VOLATILE ORGANIC COMPOUNDS.

LEGEND

- RI MONITORING WELL (1993)
- RI PIEZOMETER (1993)
- LIMITS OF FILL AREA
- WETLAND BOUNDARY
- NYSDEC PHASE II MONITORING WELL (1984)
- SURFACE/WATER SEDIMENT SAMPLE (1993, 1994)
- SURFACE SOIL SAMPLE POINTS

150 0 150
SCALE IN FEET
CONTOUR INTERVAL = 5 FT.

NORTH EAST LANDFILL - SUMMARY OF LANDFILL CONTAMINANT IMPACT

URS CONSULTANTS, INC.

FIGURE 4

35319.20 1=150 10/10/94-2 MAB

CC:375

TABLES

TABLE 1
COST SUMMARY

ALTERNATIVE NUMBER	1	2	3	4	5	6
CAPITAL COST						
Posting and Fencing		$73,300	$73,300	$73,300	$73,300	$73,300
Deed Restrictions		$2,000	$2,000	$2,000	$2,000	$2,000
Part 360 Cap			$3,959,400	$3,959,400	$3,959,400	$3,959,400
Soil Vapor Extraction and Air Sparging				$1,039,000		
Groundwater Collection Trench					$845,000	$1,977,000
Groundwater Treatment System					$413,000	$1,183,000
Sediment Remediation			$28,100	$28,100	$28,100	$28,100
TOTAL CAPITAL COST	$0	$75,300	$4,062,800	$5,101,800	$5,320,800	$7,222,800
ANNUAL O&M COSTS						
Fence Inspection & maintenance		$2,800	$2,800	$2,800	$2,800	$2,800
Monitoring		$89,600	$30,700	$30,700	$30,700	$30,700
Cap			$5,200	$5,200	$5,200	$5,200
Collection Trench					$1,680	$1,680
Groundwater Treatment					$134,400	$319,200
Soil Vapor Extraction and Air Sparging (each of 3 yrs.)				$154,200		
TOTAL ANNUAL O&M	$0	$92,400	$38,700	$38,700	$174,780	$359,580
Present Worth of O&M	$0	$1,271,424	$532,512	$995,112	$2,404,973	$4,947,821
Total Present Worth (Capital and O&M)	$0	$1,346,724	$4,595,300	$6,096,900	$7,726,000	$12,170,621

APPENDIX A

APPENDIX A
Responsiveness Summary

The Proposed Remedial Action Plan (PRAP) for the Town of Northeast Landfill was issued by the New York State Department of Environmental Conservation (NYSDEC) in August 1995. A public comment period on the RI/FS Report, PRAP, and perferred alternative was held from August 7, 1995 to September 6, 1995. A public meeting was held during the public comment period on August 24, 1995 at 7:30pm at the Northeast Town Hall, Millerton, New York. A Notice of Public Meeting fact sheet was mailed to the media and all individuals listed on the Contact list in the Citizen Participation Plan announcing the Public Comment Period and Public Meeting.

There were about 15 people in attendance, including members of the Town Board and members of the press. Ms. Erin O'Dell-Keller, NYSDEC Citizen Participation Specialist opened the meeting by introducing State Representatives, the Town Engineer, and the Project Manager for the Town's engineering consultant on the landfill, Mr. David Rubin of URS Consultants, Inc. Mr. Timothy Vickerson of the New York State Department of Health briefly explained his role in the project, and stated that the Department of Health has concurred with the remedy proposed. Mr. Rubin of URS Consultants then provided an approximately 25 minute presentation on the RI/FS findings. Mr. Brian Davidson of the NYSDEC then briefly stated the remedy proposed by the State in the PRAP, and opened the meeting to questions.

All questions asked at the public meeting were answered by the Town's engineering consultant and State representatives present. The following is a summary of the the concerns raised at the public meeting and the reponses provided.

Question

How long will it take for the remedy to work and why are there variations in the timeframes for different alternatives?

Response

It would take about 1 year to build the infrastructure necessary to implement Alternatives 3, 4, 5, or 6. Alternative 3 would result in the watertable being lowered below the waste over all but a small area on the east side of the site where groundwater mounding is evident during springtime conditions. Reduced infiltration and a lowered water table would substantially reduce contaminant migration from the landfill such that groundwater SCGs would be met at the nearest potential future groundwater receptor. It would take about 2 to 5 years for this lowering of the watertable to fully occur. Alternative 4 would meet objectives at the site boundary for all media in four years if the treatment proposed was fully effective. Alternatives 5 and 6 would meet the groundwater objective over the long-term when monitoring results indicate that collection is no longer needed to meet SCGs.

Question

What is the extent of the waste and how far does the contamination extend? Does it extent all the way to Webatuck Creek?

Response

The landfill waste covers approximately 15 acres (see Figure 2 in the PRAP). All residential wells in the vicinity of the landfill have been sampled over the years by the NYSDOH and DCDH and no contamination related to the landfill has ever been found in residential wells. Groundwater contamination was detected in the shallow groundwater on the northeast side of the landfill, but the data collected during the RI indicates that the contamination does not extend all the way Webatuck Creek.

Question

The pasture east of the landfill has not been used due to cattle aborting and getting cancer. When can this pasture be used again? Isn't the contaminated groundwater in the aquifer pushing back up to the surface?

Response

Drinking water standards will be met at the nearest potential receptor with the implementation of Alternative 3. Ultimately, the shallow groundwater discharges to the wetlands and Webatuck Creek. Samples of surface water and sediments were obtained at various locations around the site (PRAP Figure 2). Other than a detection of 11ppb of 2-Butanone in SW-2 and 2ppb of bis-phthalate in SW-7, no volatile or semivolatle compounds were detected in surface water, and the compounds detected do not exceed standards at these concentrations. Iron was detected in surface water above background concentrations in SW-1 and SW-2 on the east side of the landfill. Trace levels of mercury were detected in SW-2 and SW-7, 0.86 ppb and 0.28 ppb respectively, slightly exceeding the suface water standard of 0.2 ppb. SW-5, taken in the stream next to the pasture was clean. Based on the data collected during the RI, there should no impact on cattle in the pasture from landfill contaminants. More information on acceptable water quality for dairy cattle can be obtained from the NYS Department of Agriculture and Markets, Division of Animal Industry in Albany (518) 457-3502.

Question

Will monitoring wells and residential wells be monitored during and after the remedy?

Response

Yes. Residential wells will be sampled periodically by the NYSDOH and DCHD. The remedy includes 30 years of monitoring of select monitoring wells

Question

How many monitoring wells were installed, and how did we determine groundwater levels?

Response

Eleven new monitoring wells and five piezometers were installed, and two previously installed monitoring wells were utilized. Groundwater elevations were obtained in the fall of 1993 and spring of 1994 by measuring the depth of the water in monitoring wells and piezometers, and surveying the locations.

Question

What about seasonal fluctuations in groundwater levels?

Response

Given that the summer of 1993 was dry, and there was significant snowfall in the winter of 1994, a significant fluctuation from fall to spring was observed. Contaminate transport models used worst case (high water) conditions.

Question

What about flood conditions, or seasons that are wetter than was used in modeling?

Response

The limits of waste are outside the boundary of the 100 year and 500 year flood plains. It is believed that the spring 1994 conditions provide data for estimates that are conservative enough, and that the groundwater conditions have been adaquately characterized.

Question

What about encroachment of groundwater once the site is capped? How will that effect the contamination at the edge of the landfill?

Response

There are features that can be built into the design of a landfill cap, such as anchors at the edges of the membrane, to help ensure the integrity of the landfill cap in the event of high water conditions. Routine maintenance on the cap will also help to ensure it's integrity. A flood event could leach some contaminants from the landfill mass, but the remedy proposed, Alternative 3, would still be effective in meeting objectives even in the event of a flood, and as previously stated the limits of waste are outside the boundary of the 100 year and 500 year flood plains.

Question

Do metals, such as lead and arsenic, break down like VOCs do?

Response

No, and they do not migrate in groundwater as quickly as VOCs.

Question

Wouldn't it behoove the DEC and DOH to identify the full extent of the groundwater contaminate plume?

Response

Groundwater flow in the site vicinity is generally to the northeast in the shallow unconfined aquifer, deeper intermediate zone of the unconfined aquifer and in the bedrock aquifer. A comparison of shallow and bedrock water levels indicates that the unconfined and bedrock aquifers are nearly at equilibrium along the west side of the landfill, but there is a large upward vertical gradient on the east side of the landfill. In fact, bedrock wells on the east side of the landfill exhibited flowing artisian conditions. This prevents the downward migration of contaminants. Unconsolidated sediments on the east side of the landfill consist of clayey, sandy silt with relatively low permeablities and very slow groundwater movement. Although the shallow groundwater eventually discharges to Wetland MT-26 and the Webatuck Creek further east, groundwater modeling indicates that it takes many years for this to occur. There is very little potential for human consumption of groundwater impacted by the landfill since future development within the designated wetlands is not likely. Many contaminants in groundwater are naturally attenuated, dispersed, and broken down in wetland environments. Volatilization and dilution will also serve to reduce contaminant concentrations over time. Further investigation northeast of the landfill would require obtaining easements to drill on private property and would require the construction of access roads to drill sites in the designated wetlands. These may alter hydrology and destroy wetland habitat. If further investigation northeast of the landfill indicated low levels of VOCs in the shallow groundwater, it would not change the selection of the remedy, since groundwater pumping in the clayey, sandy silt unit would not be effective due to its low permeability.

Question

Have the impacts to the wetland habitat and the bog turtle been assessed?

Response

Yes. Hazard Quotients calculated for wildlife exposure to each of the site contaminants of potential concern indicate potential chronic toxic effects for the meadow jumping mouse from arsenic and manganese in the localized area of the seep northeast of the landfill. No other potential landfill impacts, to the bog

turtle or wetland habitat, were identified. Sediment remediation included in the remedy will eliminate the potential ecological risk which has been identified.

Question

Shouldn't contaminated sediments be taken offsite to a hazardous waste facility?

Response

No. Although the sediments in the small seep area northeast of the landfill appear to have elevated concentrations of certain metals, the sediments are not hazardous waste. Due to the limited area of sediments to be remediated (approximately 0.2 acres), and the objective to minimize impacts on the wetlands, large equipment excavation methods would not be appropriate at this site. Contaminated sediments (up to about 300 cubic yards), will be transported, deposited, graded, and spread on the landfill for drying prior to landfill cap construction. A berm may have to be constructed to control runoff. Appropriate hydrophilic soils will then be placed in the wetland and plant species would be introduced by seed or live transplants to promote growth of species already adapted to the area. The actual sediment removal and restoration methods will be determined during remedial design.

Question

Why do some alternatives include constructing an on site treatment facility, rather than evaluating treatment off site at an existing waste water treatment plant? Where would on site treatment discharge?

Response

Alternatives 5 and 6, which are not proposed, include the construction of an onsite leachate/groundwater treatment facility. Off site treatment is not practical due to the volume of water that would have to be transported and the distance to the nearest treatment plant. No conceptual design for on site treatment was developed, but a logical discharge point would be the tributary to the Webatuck Creek that runs near the site.

Question

The remedy doesn't include bringing construction and demolition material on site, does it?

Response

Approximately 70,000 cubic yards of material will be required in preparing the landfill cap subgrade. Alternative Grading Material (AGM) may be considered for use in preparing the subgrade rather than soil determined to be available during

the remedial design phase. AGM is processed construction and demolition debris which has been used in other closures. The use of AGM would require the preparation and Department acceptance of an AGM Program Operations Plan in order to ensure that the AGM would be of a select and uncontaminated nature, the AGM would be properly placed and compacted, and the AGM would meet all State and local requirements. In order to solicit public comments and concerns, a public availability session would be held prior to the Department's determination of the acceptability of the AGM Program Operations Plan.

Question

What kind of odor problems can be expected? Won't gas vents concentrate odors?

Response

Based on the data collected during the RI and experience at other sites, odors are not expected after the landfill is capped. If odor problems are reported to or detected by the NYSDEC or NYSDOH, odors will be eliminated by fitting gas vents with carbon filters.

Question

Can the site be used for anything after it has been capped, such a grazing livestock or growing hay?

Response

Theoretically the surface of the cap could be used for grazing or growing hay, but that is not likely, and may not be a good idea. Although the Town will mow the cap as needed, the amount of heavy equipment used on the cap should be minimized. The surface of the cap will be occasionally inspected and maintained as necessary to ensure it's integrity.

Question

How tall will the gas vents be above the ground?

Response

Gas vents will be 3 or 4 feet in height. They will be goosenecked plastic pipes, 6" in diameter, and will be earth tones in color to blend will natural surroundings. There will be roughly one per acre.

Question

Will the remediation interfere with the proposed "Rail Trail" or vice versa?

Response

No. Apparently the rail trail next to the landfill is currently privately owned, but will be acquired. The cap will not extent that far west. More information

on the exact route of the rail trail can be obtained from the Town Supervisor.

Comment by Town Engineer

The Town requests that "FML" cap be deleted from the Record of Decision in order to allow the Town to consider the use of an equivalent clay cap.

Response

The DEC will allow for the option of clay or an FML as a barrier layer in the cap. A properly designed clay cap could be as effective as a properly designed FML cap.

The public meeting ended at about 8:45pm.

Written Comments

Written comments were accepted until September 6, 1995. The following are the Department's responses to the comments received.

1. August 25, 1995 correspondance from George Kastner

Point One - General Comment

Metals in the spring seep area northeast of the landfill may be redeposited after the cleanup, and this may require another remediation in the future. Metals are naturally occuring, and we may be trying to fix a natural situation. No other chemicals, such as pesticides or PCBs were found in the sediments.

Response to Point One -

Shallow groundwater flow is toward the northeast. Based on a visual inspection of the seep area alone, it is apparent that the landfill has impacted the seep. The amount of metals staining visible on vegetation and sediments is definitely not typical for spring seeps in the area. Metals are naturally occuring, but certain metals in the seep are present in concentrations above background levels. Analytical results of sediment samples in the seep area northeast of the landfill indicate concentrations of arsenic, cadmium, chromium, iron, lead, manganese, and mercury that exceed levels that are known to be protective of fish and wildlife. Hazard Quotients calculated for wildlife exposure to each of the site contaminants of potential concern indicate potential chronic toxic effects for the meadow jumping mouse from arsenic and manganese in the localized area of the seep northeast of the landfill. Currently precipitation is flushing metals and other contaminants from the landfill mass into the shallow groundwater. Once the cap is inplace, this will no longer occur as the landfill mass will essentially be above the watertable. The sediment remediation and wetland restoration cost is estimated to be $28,100. This is less than 1% of the total capital cost of the remedy. This is a conservative estimate assuming 300 yards of sediment removed. The actual cost of the sediment remediation and wetland restoration may be less.

Point Two - General Comment

Six inches of high quality top soil at a cost of over $ 200,000 is excessive. Cover native to the area grows well in poorer grades of soil. The remediation should be done properly, but should also be cost effective.

Response to Point Two -

Vegetative cover on the landfill cap is necessary to minimize erosion. If significant erosion occurs the cap can be exposed, and repairs can be very expensive. A good quality top soil is necessary to ensure a drought resistant low maintenance vegetative cover. Cost estimates in the FS for topsoil are $16 per yard, delivered and graded. This is only $1 per yard more than general fill. In general, the FS cost estimates may be conservative, and actual total costs may be less. It may also be possible for the Town to generate some revenue that would help off set the landfill cap costs if AGM is used in grading.

2. August 29, 1995 correspondance from Kevin P. Smith

General Comment

Further testing is needed to determine the nature and extent of off site contamination and possible effects on dairy cattle.

Response to Comments -

The data collected during the RI indicated that groundwater flow in the site vicinity is to the northeast. Unconsolidated sediments on the east side of the landfill consist of clayey, sandy silt with relatively low permeablities and very slow groundwater movement. Although the shallow groundwater eventually discharges to Wetland MT-26 and the Webutuck Creek further east, groundwater modeling indicates that it takes many years for this to occur. There is very little potential for human consumption of groundwater impacted by the landfill since future development within the designated wetlands is not likely. Many contaminants in groundwater are naturally attenuated, dispersed, and broken down in wetland environments. Further investigation northeast of the landfill would require obtaining easements to drill on private property and would require the construction of access roads to drill sites in the designated wetlands. These may alter hydrology and destroy wetland habitat. If further investigation northeast of the landfill indicated low levels of VOCs in the groundwater, it would not change the selection of the remedy, since groundwater pumping in the clayey, sandy silt unit would not be effective due to its low permeability. Samples of surface water and sediments were obtained at various locations around the site. Other than a detection of 11ppb of 2-Butanone in SW-2 and 2ppb of bis-phthalate in SW-7, no volatile or semivolatle compounds were detected in surface water. Iron was detected in surface water above background concentrations in SW-1 and SW-2 on the east side of the landfill. Trace levels of mercury were detected in SW-2 and SW-7, 0.86 ppb and 0.28 ppb respectively, slightly exceeding the suface water standard of 0.2 ppb. SW-5, taken in the stream on the side of the landfill was clean.

Based on the data collected during the RI, no impact to wildlife in the wetland or pasture east of the landfill would be expected from the landfill. Hazard Quotients calculated for wildlife exposure to each of the site contaminants of potential concern indicate potential chronic toxic effects for the meadow jumping mouse from arsenic and manganese only in the localized area of the seep northeast of the landfill. Wildlife, especially smaller mammals would probably have more exposure to soils and vegetation in this area over a lifetime than livestock grazed in the pasture. There may be explanations for abnormalities in cattle grazing in the pasture east of the landfill other than effects from the landfill. Certain plants that grow in wetland areas can have toxic effects when ingested. Division of Fish and Wildlife staff would be interested in reviewing any studies, reports, or correspondences that you may have from other professionals who may have investigated any abnormalities in cattle using the pasture to the east of the landfill. More information on acceptable water quality for dairy cattle can be obtained from Dr. John Huntley, NYS Department of Agriculture and Markets, Division of Animal Industry in Albany, (518) 457-3502.

3. September 5, 1995 correspondance from Daniel F. Wheeler, P.E.

General Comment

The proposed remedy as stated in the PRAP should be modified to allow for consideration of a clay cap in design.

Response to Comments -

The Record of Decision will not specify an FML impervious layer to allow for consideration of a clay impervious layer in design.

4. September 5, 1995 correspondance from Lynn Mordas

General Comment

Extensive Comments on the RI/FS Workplan submitted May 28, 1993 were not addressed.

Response to Comment -

All comments received on the RI/FS Workplan were addressed in the document entitled Responsiveness Summary for the Public Comments on the Proposed Remedial Investigation/ Feasibility Study at the Northeast Landfill prepared by URS Consultants, Inc., dated September 1993. This document is available at the document repositories.

General Comment

The RI failed to adequately assess current usage of groundwater in the vicinity of the landfill and additional data collection is warranted. All residences within a one mile radius of the site were not sampled. The RI indicates groundwater flow is to the northeast, yet only residents to the south were sampled. No statistically relevant data base exists for residential wells. Information on residential wells is inaccurate or incomplete.

Response to Comment -

As is documented in the RI Report, an attempt was made to interview all homeowners within a mile of the site. Questionaires were mailed to residents that were not available. Considerable data has been collected from residential wells over the years by the the DCDH and the NYSDOH. As was stated at the public meeting the NYSDOH will continue to monitor residential wells in the future. Residential well sampling was more concentrated south of the landfill because there are more residences in closer proximity to the landfill in this area. As is documented in the RI Report, there is no indication of site contaminants in any residential wells. The decision on which residential wells to sample during the RI was made by the NYSDOH. Any resident in the area that has concerns about their water quality should contact the NYSDOH or DCDH. There are no residential wells in close proximity to the site to the northeast. Collecting samples for analysis from all wells within a one mile radius in all directions from the site is beyond the scope of this project.

General Comment

Sampling was limited. Leachate and on site surface soils were not sampled.

Response to Comment -

Many environmental samples were collected during the RI. Numerous samples of air, surface water, surface sediments, groundwater, and subsurface soils were collected and analyzed at many locations in order to characterize the site. Landfill leachate was not sampled because there was no leachate to sample on the landfill in the fall of 1993 or the spring of 1994 when sampling occured. In addition to surface water and sediments east and south of the site, surface water and sediments north and west of the site were sampled. Naturally, there does have to be some limit to sampling. The cost of the RI was over $ 400,000. Enough data was collected to characterize the site and evaluate remedies.

General Comment

Risk associated with chemical reactions of contaminants, secondary exposure routes (ingested crops and vegetation), and risks to livestock were not assessed. Health risks for children are based on only a 5 year duration. Wildlife exposure pathways ignore the food chain and the impact to trout in the Webutuck Creek is not assessed.

Response to Comment -

The Health Risk Assessment (HRA) performed for the Northeast Landfill was based on the analytical results of environmental media sampled during the RI. The HRA used actual results and did not take into account chemical reactions that may take place, such a chemical degradation, dilution, and volatilization. Therefore, the HRA was conservative, and actual chemical concentations within the environmental media may be less than assumed in the HRA. The exposure parameters used in the HRA were taken from USEPA risk guidance documents. An exposure duration of 5 years was used for a child since 5 years was assumed to be the amount of time that a child in the area might have direct contact with the landfill. The HRA assumes that young children would not be likely to be trespassing unsupervised on the landfill and older children (16 and over) are modeled as adults. The HRA demonstrated that under the current land use scenario, noncarcinogenic and carcinogenic chemicals pose no unacceptable threat to the population (i.e. residents and trespassers). Since this is the case for primary exposure routes, additional study to assess secondary exposure routes is not warranted. Contaminants with high bioaccumulation factors, such as PCBs, were not detected at the landfill. The tributary to the Webatuck Creek that flows near the landfill was sampled, and was found to be clean. The RI data indicates that there would be no impact on trout in the Webatuck from the landfill.

General Comment

The remedy proposed is a "band-aid" approach. The potential for horizontal and vertical contaminant migration has not been adaquately assessed in the shallow and principal aquifers. The possible effects of groundwater encroachment and flooding have not been considered. Little or no provision is made for groundwater monitoring off site.

Response to Comment -

Groundwater movement was assessed through data collected from 13 monitoring wells around the landfill perimeter and 5 piezometers within the fill area. Groundwater flow in the site vicinity is generally to the northeast in the shallow watertable aquifer, deeper intermediate zone of the watertable aquifer and in the bedrock aquifer. A comparison of shallow and bedrock water levels indicates that the watertable and bedrock aquifers are nearly at equilibrium along the west side of the landfill, but there is a large upward vertical gradient on the east side of the landfill. The site does not overlie a Principal aquifer. This site specific determination was made by the Department based on the data collected during the RI. The remedy provides for long term groundwater monitoring.

Further investigation northeast of the landfill would require obtaining easements to drill on private property and would require the construction of access roads to drill sites in the designated wetlands. This may alter hydrology and destroy wetland habitat. If further investigation northeast of the landfill indicated low levels of VOCs in the groundwater, groundwater pumping in the clayey, sandy silt unit that exists in this area would not be effective due to its low permeability. The landfill needs to be regraded and properly capped as

expeditiously as possible in order to prevent further degradation to the environment. The landfill cap will result in the watertable being lowered below the waste over all but a small area on the east side of the site where groundwater mounding during springtime conditions may saturate approximately 6 inches of refuse. Significantly reduced infiltration and a lowered water table would substantially reduce contaminant migration from the landfill such that groundwater SCGs would be met at the nearest potential future groundwater receptor. It would take about 2 to 5 years for this lowering of the watertable to fully occur. The limits of waste are outside the boundry of the 100 year and 500 year flood plains. Additional study would be time consuming and expensive, and the State can not envision how additional study would alter the remedy selected.

General Comment

As one of the few areas of sustainable agriculture in Dutchess County, the Town of Northeast requires and deserves special consideration.

Response to Comment -

The landfill is located within Agrilculture District #21 as mapped by the NYS Department of Agriculture and Markets. The remedy will not adversely impact agricultural activities in the area in any way. The site is also located within the National Register listed Coleman Station Historic District and therefore input on the proposed remedy was solicited and received from the Office of Parks, Recreation and Historic Preservation.

APPENDIX B

APPENDIX B
Administrative Record

A. Reports

1) Proposed Remedial Action Plan "Town of Northeast Landfill" prepared by the New York Department of Environmental Conservation August 1995

2) Feasibility Study at the Northeast Landfill prepared by URS Consultants, Inc. June 1995

3) Remedial Investigation at the Northeast Landfill; Volume I, Report, Volume II Apendices A-M; prepared by URS Consultants, Inc. October 1994

4) Responsiveness Summary for the Public Comments on the Proposed Remedial Investigation/Feasibility Study at the Northeast Landfill prepared by URS Consultants, Inc., September 1993

5) Work Plan, Quality Assurance Project Plan, & Field Sampling Plan prepared by URS Consultants, Inc., August 1993

6) Citizen Participation Plan, prepared by URS Consultants, Inc., April 1993

7) Health and Safety Plan, prepared by URS Consultants, Inc., January 1993

B. Previous Studies

1) Phase II Investigation for the Town of Northeast Landfill, prepared by Wehran Engineering, November, 1984.

2.) Phase I Investigation for the Town of Northeast Landfill, prepared by Wehran Engineering & CDM, November, 1983.

C. Court Orders

Order on Consent, Index # W3-0181-87-12, August 13, 1991

D. Corrspondence & Memorandums

July 30, 1995 correspondence from G. Anders Carlson, NYSDOH, to Mr. Michael J. O'Toole, NYSDEC - concurrence on the PRAP.

July 7, 1995 memorandum from Richard Koeppicus, Division of Fish and Wildlife to Brian Davidson - concurrence on the PRAP

May 9, 1994 memorandum from N.G. Kaul, P.E., Director, Division of Water, to Michael J. O'Toole, P.E., Aquifer Determination: Northeast Landfill