FINAL ROD

File 152052
FOILABLE

RECORD OF DECISION

NORTH SEA MUNICIPAL LANDFILL
TOWN OF SOUTHAMPTON
SUFFOLK COUNTY, NEW YORK

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION II

NEW YORK

ROD FACT SHEET

SITE

Site name: North Sea Municipal Landfill

Site location: Southampton, Suffolk County, New York

HRS score: 33.74

ROD

Selected remedy: No Action for Groundwater remediation

Capital cost:

O & M cost:

Present-worth cost:

LEAD

U.S. Environmental Protection Agency

Primary Contact: Caroline Kwan, (212) 264-0151

Secondary Contact: Melvin Hauptman, (212) 264-7681

Main PRPs: The Town of Southampton

WASTE

Waste type: heavy metals (lead, chromium, cadmium, manganese, iron)

Waste origin: landfill activities

Estimated waste quantity: 1.3 million cubic yards in Cell #1

Contaminated medium: groundwater

DECLARATION FOR THE RECORD OF DECISION

Site Name and Location

North Sea Municipal Landfill, Town of Southampton, Suffolk County, New York

Statement of Basis and Purpose

This decision document presents the selected remedial action for the North Sea Municipal Landfill Operable Unit Two site (the Site), located in the Town of Southampton, Suffolk County, New York, which was chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. §§ 9601-9675, as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300. This decision document explains the factual and legal basis for selecting the remedy for the Site.

The New York State Department of Environmental Conservation (NYSDEC) concurs with the selected remedy. A letter of concurrence from NYSDEC is attached to this document (Appendix IV).

The information supporting this remedial action decision is contained in the administrative record for the Site. The administrative record index is attached (Appendix III).

Description of the Selected Remedy: No Further Action

The United States Environmental Protection Agency (EPA) bases the no action decision for the Site ground water contamination and its impact on Fish Cove on the results of the Operable Unit (OU) I and II remedial investigations conducted at the Site from 1987 to 1992, the OU II risk assessment dated May 1992, and the OU I source control activities at Cell #1 that are scheduled to be implemented at the Site in 1993. Confirmatory sampling of the decommissioned sludge lagoons was conducted in January 1992 and no additional sludge was found. Furthermore, the OU II risk assessment determined that the risks to human health are within EPA's acceptable risk range. The source control action of capping Cell #1 will reduce the potential threat to human health and the environment by isolating the landfill and reducing the risk of contaminant migration from Cell #1 to Fish Cove which results from leachate generated by surface precipitation. Thus, "No Action" is the selected remedy for the second operable unit for the Site.

Declaration

In accordance with the requirements of CERCLA, as amended, and the NCP, it has been determined that no further remedial action is necessary to protect human health and the environment at the North Sea Municipal Landfill Site. Source control activities conducted in accordance with the OU I Record of Decision will be implemented in 1993.

The EPA, in consultation with the State of New York has determined that the North Sea Municipal Landfill OU II does not pose a significant threat to human health or the environment and, therefore, further remediation of the ground water on and off the landfill property is not appropriate.

Although a five year review will be conducted at the landfill pursuant to the OU I ROD, no five-year review is required for OU II because no hazardous substances have been identified in this OU above health-based levels.

Constantine Sidamon-Eristoff
Regional Administrator

September 28, 1992
Date

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ATTACHMENTS

SITE NAME, LOCATION AND DESCRIPTION

The North Sea Municipal Landfill is located on eastern Long Island at the intersection of Majors Path and Old Fish Cove Road in the Township of Southampton, Suffolk County, New York (see Figure 1). The 131 acre Site is an active landfill owned and operated by the Town of Southampton.

The area between the Site and the nearest point of surface water (Fish Cove, about 1500 feet northwest of the Landfill) is moderately populated. There are approximately 15 homes within a one-quarter mile radius from the landfill and approximately 100 homes within a one-half mile radius. Most of the residents are located north, northwest and west of the landfill and are hydrologically downgradient of it. (see Figure 2)

The Town of Southampton lies 2.4 miles to the south of the Site. There are no major population centers to the east. This area is predominantly wooded. Land use within a one-half mile radius of the Site generally consists of private homes. A junkyard is located on the east side of Majors Path, approximately 0.6 miles south of the landfill entrance. A sand/gravel borrow pit is located west of Majors Path, between the landfill and Fish Cove.

The North Sea Municipal Landfill is located in glacial till deposits north of the Ronkonkoma moraine. North of the moraine are kame deposits. These deposits reach a maximum altitude of about 100 feet and mark areas of disintegrated, stagnant ice from the last glacial period.

The landfill is south of the southern shore of Little Peconic Bay, in an area with extensive ponds, coves and wetlands. The terrain is generally flat with elevations less than 100 feet above mean sea level. Slopes drop north to the bay. Soils in the area are sands and gravels, and ponds are surface expressions of ground water. The landfill cells and lagoons are unlined. The sandy soil allows rapid movement of contaminants through the soil to the ground water.

The landfill is situated above fresh water aquifers which overlie deeper salt water aquifers. The unconsolidated deposits of Cretaceous and Quaternary Age rest unconformably on the Precambrian-Upper Paleozoic basement complexes. The Upper Cretaceous deposits include, in ascending order: (1) the Raritan Formation consisting of the Lloyd sand member and an overlying clay member; (2) the Magothy Formation-Matawan Group, undifferentiated; and (3) the Monmouth Group. Except for the Monmouth Group, these units are continuous throughout the North Sea study area. The Cretaceous deposits are overlain by Pleistocene and Holocene (recent) deposits. The Pleistocene deposits consist of glaciofluvial deposits of the Upper Glacial aquifer. The North Sea Municipal Landfill is situated above two

fresh water aquifers: the Cretaceous Magothy aquifer and the Upper Glacial aquifer.

The Magothy aquifer is the deepest fresh water bearing zone. The top of the Magothy occurs at a depth of about 150 to 180 feet below mean sea level at the study area. The Magothy is a water transmitting aquifer consisting of clay, sandy clay and silty clay.

The Upper (water table) Glacial fresh water aquifer is estimated to be about 200 to 300 feet thick in the area of the landfill. It directly overlies the Magothy aquifer. It is primarily composed of Pleistocene sands and gravels. Like the Magothy aquifer, it also contains numerous silt and clay units. Most wells in the area are completed in this aquifer.

Ground water is replenished primarily from recharge via precipitation and lateral underground flow of fresh water. The precipitation which reaches the main aquifer continues to flow vertically through the zone of saturated gravel of the Upper Glacial aquifer at a rate of movement proportional to the slope of the water table and the permeability of the soils.

Most of the homes obtain their drinking water from private domestic wells tapping the highly permeable Pleistocene deposits of the Upper Glacial aquifer. A plume of contaminated ground water in this aquifer, moving northwest from the landfill, has resulted in the closure of several drinking water wells. Public water supplies have been extended to serve residents of the area. Ground water in this area ultimately discharges to Fish Cove, an arm of Peconic Bay. The plume is contaminated with low levels of heavy metals.

Surficial soils associated within and surrounding the landfill are the Plymouth-Carver Association Sands and "made" land. The soils of Suffolk County were deposited as a result of glaciation during the Wisconsin Age. The glacial outwash consists of sorted sand and gravels. The Plymouth-Carver Association soils are found on rolling moraines and side slopes of drainage channels of outwash plains. These soils consist of deep, excessively drained, coarse textured soils that are not suitable as a source of topsoil. "Made" land consists of concrete, bricks, trash and wire; anything but natural soil. This defines the landfill area.

Fish Cove is a body of saltwater with marshes connected via a tidal inlet to the North Sea Harbor. The low marshes are relatively stable and productive, supporting a variety of marine invertebrates, juvenile fish species and water fowl. The intertidal marsh is dominated by salt marsh cord grass (spartina alterniflora). The marsh area is about 45,000 square feet consisting of both intertidal and high marsh.

The North Sea Municipal Landfill is located in the general vegetative biome referred to as an oak-dominated forest. Oaks are the dominant species. No surface water bodies (except puddles created by rain water accumulation) exist on the landfill property. The landfill is located near several naturally occurring surface water bodies. These are Fish Cove, Big Fresh Pond and Little Fresh Pond. The latter two are fresh surface waters.

The following rare, threatened, and endangered species are identified by New York State for the North Sea area: 1) bird species: least tern and piping plover, 2) rare plant species: Bushy Rockrose, Hairy Woodrush and Lespedeza stueri 3) rare butterfly: Hessel's Hairstreak. Floral and faunal species which are present are typical of the respective habitats. There are no identified federal endangered or threatened species in the vicinity of the Site.

SITE HISTORY AND ENFORCEMENT ACTIVITIES

The North Sea Municipal Landfill, owned and operated by the Town of Southampton (Town), was initially constructed in 1963 for the disposal of municipal solid waste, refuse, debris and septic system wastes from residential, industrial and commercial sources. Significant features of the Site include landfill Cell #1 (inactive, partially capped, unlined); excavated/filled scavenger lagoons; landfill Cell #2 (capped); and Cell #3 (active). See Figure 3 for relative locations of these cells.

A ground water monitoring program, conducted by the Town of Southampton since 1979 has revealed a plume containing heavy metals migrating from Cell #1 toward Fish Cove. As a result, the Site was investigated and proposed on the EPA's list of priority hazardous waste sites known as the Superfund National Priorities List (NPL) in June 1984.

Cell #1 consists of two earlier landfill areas and totals approximately 13 acres. It received septic system sludges in the early 1960's in addition to municipal solid wastes. The total quantity of wastes in Cell #1 is estimated to be 1.3 million cubic yards.

As a result of the Site (Cell 1 and former scavenger lagoons) being placed on the NPL list, Cell #1 was subsequently closed in 1985. Closure of the cell consisted of capping the top flat portion (about eight acres) with a 20 mil polyvinyl chloride membrane to minimize infiltration into the mound and covering it with a thick protective layer (two feet thick) of silty sand on top of the geomembrane. A layer of topsoil was placed over this to maintain vegetative growth and prevent soil erosion.

The Town of Southampton also installed a storm water diversion

and collection system to aid drainage. Manholes and a piping collection system along the haul road were installed before the recharge basin. The manholes, as provided for, were utilized as collection inlets with the runoff being transported into a separate recharge basin, located west of the landfill in virgin ground. This system is currently still in operation and actively collecting storm water and recharging it. As a result of the steepness of the side slope, the sides of Cell #1 were not capped. Infiltration of rainwater into the landfill is minimized as a result of the steepness of the side slopes. Also, vegetation has taken root along a good portion of the landfill side slopes. Absorption of water by this plant growth further minimizes infiltration.

Since the collection inlets were installed above the synthetic membrane, which is kept in place by a protective layer of sand, rain water falling on the top surface of Cell #1 is directed and recharged into virgin ground as noted above. Surface runoff from the relatively steep slopes is conveyed to the adjoining land surrounding the cell where it then follows existing contours and eventually recharges into the ground.

In the late 1960's, a series of 14 scavenger lagoons, approximately 50 feet long, 10 feet deep, 25 feet wide and 50 feet above the water table were constructed at the southern portion of the landfill property. The lagoons accepted septic system wastes from both commercial and residential sources. Sludge was allowed to drain and dry, and was subsequently disposed of in landfill Cell #1. Throughout the active life of these lagoons, it is estimated that they received a total of 11 million gallons of septic waste.

The sludge lagoons were decommissioned in 1986. After this removal, an additional two feet of soil was excavated. The excavated material was dried out, then mixed with sand prior to disposal. The sludge lagoons were refilled to grade with sandy loam.

Cell #2 is approximately seven acres in size and constructed about 20 feet above the water table with a leachate collection system. An underground fire destroyed the cell's leachate pumping system in 1987. However, a new well and pump has been installed to handle leachate. The new system is designed to pump leachate to a truck for off-site treatment. Cell #2 was closed pursuant to an administrative order on consent executed between the Town and the New York State Department of Environmental Conservation (NYSDEC) in 1990. Cell #3 is currently active. The cell accepts approximately 80,000 tons of municipal waste annually. Seasonal disposal rates are approximately 400 tons per day in the summer months and 100 tons per day in the winter.

In December 1985, the EPA sent a letter to the Town of

Southampton informing the Town that it was considered a potentially responsible party (PRP) under Superfund for the Site and, as such, may be liable for funds spent by the EPA for addressing conditions at the Site. The letter explained to the Town that they may participate in or undertake the Remedial Investigation/Feasibility Study (RI/FS) if they wished.

The Town of Southampton entered into an Administrative Order on Consent with EPA which was issued on March 31, 1987. Under this order, the Town took responsibility for conducting the RI/FS, which began on August 18, 1987. A Record Of Decision (ROD) was issued for OU I in September 1989 for the source control of Cell #1. This ROD calls for capping of Cell #1 pursuant to the NYSDEC Part 360 requirements and conducting confirmatory sampling on the decommissioned sludge lagoons. The Town entered into a Consent Decree with EPA in February of 1990 to implement the OU I ROD. Confirmatory sampling of the former sludge lagoons was conducted in January 1992 and no sludge was found. The remedial design is expected to be completed by the Fall of 1992 and the remedial construction will commence in the Spring of 1993.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

The RI report, Risk Assessment and the Proposed Plan for the Site were released for public comment on July 22, 1992 pursuant to the requirements ser forth in CERCLA Sections 113(k)(2)(i-v) and 117. These documents were made available to the public in the administrative record file at the EPA Docket Room in Region II, New York and the information repositories at the Southampton College Library in the Town of Southampton. All Site files are also located in the EPA Docket Room, the Southampton College Library and the Southampton Village Library. A public notice was published on July 22, 1992 in the New York Newsday, Suffolk edition, announcing EPA's proposed no action plan, the availability of these documents for review and notice of the August 5, 1992 public meeting. The same notice was also published in the Southampton Press, a local newspaper.

A public participation meeting was conducted by EPA on August 5, 1992, at the auditorium of the Southampton Town Hall, Southampton, New York to discuss the summary of the RI report and the Risk Assessment and to provide an opportunity for interested parties to present oral comments and questions to EPA.

A summary of the significant comments relating to the selection of the remedy received during the public meeting and public comment period and EPA's responses to these comments are presented in the Responsiveness Summary (see Appendix V).

SCOPE AND ROLE OF RESPONSE ACTION

The primary objective of this second operable unit was to

determine the nature and extent of Site ground water contamination and its impact on Fish Cove.

This is the second and final operable unit planned for the Site. Under the Consent Decree for OU I, the Town of Southampton will cap Cell #1 pursuant to the NYSDEC Part 360 requirements to reduce leachate generation. This Consent Decree also calls for confirmatory sampling of the former sludge lagoons. Confirmatory sampling of the decommissioned sludge lagoons was conducted in January 1992. No additional sludge was found. Cell #1 is scheduled to be capped by the fall of 1993. Post-closure monitoring of air and water will be implemented. The following will also be included in this post-closure monitoring: five homes on the periphery of the plume will be monitored and/or connected to public water supply; ammonia flux measurements and benthos and hard clam recruitment will be conducted at Fish Cove. This source control action will reduce the threat to human health and the environment by isolating the landfill and reducing the risk of contaminant migration from Cell #1. Currently, a water quality monitoring program is being implemented pursuant to NYSDEC's Administrative Order for closure of Cell #2 and potential future expansion of the North Sea Landfill.

SUMMARY OF SITE CHARACTERISTICS

Several investigations have been conducted to characterize ground water quality near the North Sea Municipal Landfill. These studies were performed by both the Suffolk County Department of Health Services (SCDHS) and the Town of Southampton. In 1979, SCDHS established the presence of a leachate plume emanating from the landfill. As part of its study, SCDHS installed 14 monitoring wells on-Site and downgradient of Cell #1. The result of the study indicated that a plume was migrating in a northwesterly direction away from Cell #1. The plume contained primarily elevated levels of iron and manganese.

The Town hired H2M Group in 1979 to conduct its own study. H2M Group sampled 16 private residential wells downgradient of the landfill for various water parameters. The results showed that several wells has been impacted by the ground water plume (i.e. iron and manganese). The Town connected these homes to the public water supply in 1981.

In September 1981, the Town initiated a quarterly sampling and analysis program to determine the approximate extent of leachate migration from the landfill. This was required pursuant to the NYSDEC Part 360 Solid Waste Management Facility Permit.

In 1987, the Town commenced the OU I RI. Eleven ground water monitoring wells were installed. Surficial and subsurface soils were sampled and analyzed. Surface water and sediment were

sampled and analyzed from Fish Cove. Results of the OU I RI indicated that heavy metals were contained in a plume emanating from Cell #1. Results of the surface water samples showed ammonia, iron, and manganese detected at all sample locations.

The Site was then separated into two OUs. The OU II remedial investigation commenced in July 1989. Two additional wells were constructed northwest and downgradient of Cell #1; all of the RI/FS wells were re-surveyed and re-sampled; residential wells were sampled; baseline air emission rates for the Site in its undisturbed state were calculated; flux measurements, surface water and clams were sampled and analyzed and a benthic survey was also performed in Fish Cove. The results of the RI are summarized below.

Ground water

The eleven original and the two newly installed (12A and 12B) monitoring wells (MW) (see Figure 3) were sampled for the total analyte list of metals and volatile organic compounds (VOCs). Leachate parameters and phenols were included in the analysis. Table 1 (unfiltered) and Table 1A (filtered) show the results of June 1991 sampling for inorganics. Table 2 shows the results of VOCs detected in the June 1991 sampling event. Table 3 shows the results of inorganics for MW 12A and 12B in the September 1991 sampling round and Table 4 shows the results of VOCs in MWs 12A and 12B.

In the June 1991 sampling event, an unfiltered concentration of 37 parts per billion (ppb) of arsenic was detected in MW#3b. This is slightly higher than the NYSDEC drinking water standard (25) but below the Federal drinking water standard (50)(also referred to as a Maximum Contaminant Level (MCL)). The other sampling events showed arsenic was detected below the NYSDEC drinking water standard.

Chromium (Cr) was detected in seven out of twelve MWs including upgradient wells. The ranges were from 53 ppb to 1310 ppb. The highest concentrations were detected at MW 12A and 12B which are immediately downgradient of Cell #1. Cr was detected in only one well downgradient of the landfill (4C) at 53 ppb which is slightly higher than the NYSDEC drinking water standard and the MCL (50 ppb).

Lead was detected above EPA's Action Level for lead in ground water at Superfund sites (15 ppb) in two upgradient and two on-Site wells during the OU 1 sampling events. During the OU 2 sampling events, lead was detected at 37 ppb in MW12A, 25 ppb in MW12B (which are both located immediately adjacent to the landfill) and 26 ppb in a upgradient well. This is higher than the NYSDEC drinking water standard (25 ppb) and EPA's Action Level for lead in ground water. All filtered samples and

residential well samples that were taken during both OU investigations were below the EPA's Action Level for lead.

Both iron and manganese were detected in the ground water monitoring wells at levels which exceeded the NYSDEC drinking water standards. However, these standards are based on aesthetic qualities rather than health concerns.

Five VOCs were detected in MW12A on one sampling event. They are chlorobenzene, ethylbenzene, 1,4- dichlorobenzene, benzene and 1,1,2-trichloroethane. The concentrations ranged up to 8, 10, 11, 4 and 16 ppb respectively. The other sampling event showed non-detectable levels of these contaminants. The NYSDEC drinking water standard is 5 ppb for each of these compounds with the exception of benzene (0.7 ppb). There are no MCLs for these compounds except benzene which is 5 ppb. Methlene chloride was detected at 14 ppb in MW12B on one sampling event. The NYSDEC drinking water standard is 5 ppb and there is no MCL for this compound.

In September 1991, residential wells utilized for potable water were sampled in the vicinity of the Site to ensure that the water met the Federal and State drinking water standards. Results of the sampling indicated that no contaminants above Federal and State drinking water standards were detected with the exception of iron and manganese which exceeded the NYSDEC drinking water standard slightly. As stated previously, these standards are secondary MCLs established for aesthetic qualities and public acceptance of drinking water (e.g. taste and odor) and/or not based on health or hazardous effects. See Table 5.)

BASELINE AIR EMISSION RATES

Baseline air emissions were calculated in the OU II RI using soil gas vapor concentration data collected during the first operable unit RI. The "worst case scenario" emissions were calculated using the highest concentration of contaminants detected. The actual annual impact, maximum potential annual impact, and maximum short-term impact were calculated using baseline emissions estimates for each contaminant. These values were compared to EPA's contaminant specific Ambient Guideline Concentration (AGC) and Short-term Guideline Concentration (SGC). Comparison of the calculated downwind concentrations with each respective guideline concentration indicated that ambient concentrations of all contaminants evaluated were within acceptable levels. Table 6 shows the results of the Baseline Emissions Estimates and Table 7 shows the results of the Ambient Air Impacts.

FISH COVE STUDY & BENTHIC SURVEY

An initial study of Fish Cove was conducted with the State

University of New York, Stony Brook Marine Science Research Center (MSRC), in coordination with the Town's consultant, H2M Group in the Summer of 1989. The purpose of this investigation was to determine the impact of leachate discharges at the Site on water quality, to determine the movement (or flux) of leachate solutes across the sediment-water interface in the ground water discharge area at Fish Cove and to determine the mortality and chemical content of the hard clam, Mercenaria mercenaria, in Fish Cove.

Twenty-two surface water samples were collected in Fish Cove and analyzed for iron, manganese, hydrogen phosphate, chloride and ammonia. Five sediment core samples were collected for measurement of flux across the sediment-water interface. Short and long term bioassays on the larvae of hard clams were conducted. (See Figure 4.)

As a result of this study, elevated concentrations of ammonia, iron and manganese were identified in the southeast region of Fish Cove. The results of the bioassays that were done for this study suggested that hard clam larvae that spawned in or were transported to the southeast region of Fish Cove would not survive. In addition, no live adult clams were recovered by MSRC from the southeast region of Fish Cove although numerous dead and articulated shells were discovered. The results of the flux study showed a consistent trend of decreasing solute flux across the sediment/water interface with increasing distance from the southeast area of Fish Cove. Data from the dissolved oxygen and carbon dioxide flux measurements indicated that a source area of decomposing manmade materials should exist. (See Table 8.)

As a result of its location upgradient of the southeast portion of Fish Cove, MSRC considered the North Sea Landfill as the most likely candidate for causing the high organic matter decomposition rates necessary to yield elevated carbon dioxide fluxes. However, high iron and manganese fluxes from the Fish Cove sediments may be indirectly related to organic matter decomposing in the North Sea Landfill and at the bottom of Fish Cove as a result of natural processes. It was not clearly demonstrated that the high iron and manganese fluxes recorded in the Fish Cove sediment were caused entirely by the activities at the North Sea Landfill.

Based on comments received from EPA and NYSDEC, additional analyses were performed on surface water, sediment and shellfish samples from Fish Cove by H2M, consultant to the Town, during July 1989. A total of six surface water/sediment samples were analyzed for priority pollutant purgeable organics, metals, phenols, iron and manganese. In addition, sediment samples were analyzed for base neutral compounds. In the surface water samples, all priority pollutant organics were within the standards, with the exception of acetone. Acetone was found both

inside and outside of the impacted area, and is most likely a laboratory contaminant. Concentrations of copper, iron, selenium, silver and zinc were measured in the surface water samples and cadmium, copper, iron, and zinc were measured in the background samples. Low levels of 1,1,1-trichloroethane were detected in the sediment samples and in the background sample. It is possible that the presence of 1,1,1 trichloroethane may be attributed to cesspool cleaning fluids which are commonly used in cesspools, many of which are located around Fish Cove. Priority pollutant metals that were quantified in the sediment samples included arsenic, cadmium, chromium, copper, iron, lead, manganese, nickel, thallium and zinc. The majority of these metals were also present in the background sample. (See Tables 9 and 10.)

As a result of the uncertainty related to the conclusion drawn by MSRC as to the mortality of the hard clam within the southeast section of Fish Cove, additional investigatory activities were conducted in January 1992. Specifically, in an attempt to assess the nature of the ecosystem within this "impacted zone", the Town performed a benthic survey.

A total of 336 hard clams were harvested in 2 hours and 3 minutes from the southeast region of Fish Cove using conventional harvesting methods along predetermined transects. Additionally, 16 other aquatic species representing the classes of pelecypoda, gastropoda, crustacea, annelida, elasmobranchiomorphi, osteichthyes, porifera, merostomata and echinodermata were incidentally caught. Finally, much of the bottomlands found within the southeastern region of Fish Cove were found to support extensive stands of sea lettuce and other aquatic flora.

The benthic study conducted in January 1992 revealed that commercial quantities of hard clams, representing different size and age classes were present in the southeast region of Fish Cove. In addition, numerous other aquatic species were also discovered existing in the southeast region of Fish Cove. The reported diversity of these species suggests that the ecosystem in the southeast region as a whole has not been affected significantly. However, a small area within the southeast region does appear to have been more impacted than the region as a whole. This area did not yield any clams during sampling conducted by NYSDEC and NYSDOH on August 5, 1992.

During the August 1992 sampling event, the NYSDOH in conjunction with the NYSDEC and EPA, collected nine (9) composite samples of hard clams throughout Fish Cove. The nine composite samples were analyzed for priority pollutant metals. The results indicate that clam samples from Fish Cove contain levels of metals generally within the range of those collected from New York State waters and do not appear to present any significant increase health risks to consumers. (See Appendix II)

SUMMARY OF SITE RISKS

A baseline risk assessment was conducted for the OU I RI. The baseline risk assessment estimates the human health risk which could result from the contamination at the Site if no remedial action were taken. The OU I risk assessment examined the following scenarios: ingestion of ground water, ingestion of chemical in soils, dermal contact with chemicals in soils, inhalation of volatile organic compounds from soils, inhalation of fugitive dust generated from Site soils, ingestion of contaminated fish tissue, incidental surface water ingestion and dermal absorption of surface water. At the time of the OU I risk assessment, it was determined that without implementing source control action at Cell #1, a significant riaks to human health and the environmental would exist. The identified risks to human health from these exposure scenarios as examined in the OU I risk assessment have been addressed in the OU I ROD and are currently being implemented by the Town.

For the OU II RI, EPA conducted a baseline Risk Assessment to evaluate the potential risks to human health and the environment associated with the Site in its current state. The Risk Assessment focused on contaminants in the ground water and surface water which are likely to pose significant risks to human health and the environment. Additional data had been collected since the OU I risk assessment was conducted and these data were incorporated into the OU II risk assessment. The summary of the contaminants of concern (COC) in sampled matrices is listed in Table 11.

The ground water contaminant screening process for OU II identified 14 chemicals of concern: 13 metals and ammonia. The chemicals of concern chosen for this risk assessment were ammonia, antimony, arsenic, barium, beryllium, cadmium, chromium (III and VI), iron, lead, manganese, nickel, vanadium, and zinc. The compounds or elements were selected because of their toxicological properties, potentially critical exposure routes, and higher concentrations present in comparison to other contaminants.

The OU II baseline risk assessment evaluated the health effects that could result from exposure to contamination at the Site under current and future use scenarios. Four possible exposure scenarios were evaluated: (1) residential ingestion of contaminated ground water from future off-site wells (potential future), (2) ingestion of contaminated fish from adjacent ponds and streams (potential current), (3) accidental ingestion of surface water during recreational activities in on-site and adjacent streams (potential current), and (4) dermal absorption of contaminated surface water during recreational activities at local streams and ponds (potential current).

Populations who may be exposed to contaminants migrating from the Site include future residents who may use ground water for their potable water supply (e.g., drinking), residents who presently use the surrounding surface waters for recreation and residents who presently consume fish caught in the surface waters surrounding the Site.

Total body burden rates were computed based on all potential exposure routes using an average adult body weight of 70 kg and a child body weight of 15 kg. It was assumed that ingestion of ground water from on-site would occur for 30 years for adults and 6 years for children. The noncarcinogenic exposures were averaged over a 6-year period for children. For adults, the noncarcinogenic exposures were averaged over a 30-year period. An exposure period of 70 years was used for carcinogenic compounds.

Under current EPA guidelines, the likelihood of carcinogenic (cancer causing) and non-carcinogenic effects as a result of exposure to Site chemicals are considered separately. It was assumed that the toxic effects of the site-related chemicals would be additive. Thus, carcinogenic and non-carcinogenic risks associated with exposures to individual compounds of concern were summed to indicate the potential risks associated with mixtures of potential carcinogens and non-carcinogens, respectively. Non-carcinogenic risks were assessed using a hazard index ("HI") approach, based on a comparison of expected contaminant intakes and safe levels of intake (Reference Doses). Reference doses ("RfDs") have been developed by EPA for indicating the potential for adverse health effects. RfDs, which are expressed in units of mg/kg-day, are estimates of daily exposure levels for humans which are though to be safe over a lifetime (including sensitive individuals). Estimated intakes of chemicals from environmental media (e.g., the amount of a chemical ingested from contaminated drinking water) are compared with the RfD to derive the hazard quotient for the contaminant in the particular medium. The hazard index is obtained by adding the hazard quotients for all compounds within a media that impact a particular receptor population.

A hazard index greater than 1 indicates that the potential exists for non-carcinogenic health effects to occur as a result of site-related exposures. The HI provides a useful reference point for gauging the potential significance of multiple contaminant exposures within a single medium or across media. The reference dose for the compounds of concern at the Site are presented in Table 12. A summary of the non-carcinogenic risks associated with these chemicals within/across various exposure pathways is found in Table 13. All hazard indices for adults under current and future use scenarios were below the threshold level of one indicating that noncarcinogenic health effects are not likely to occur based on potential exposures to surface and ground water.

All hazard indices for children, except for potential future ground water ingestion, were also below the threshold level of one. The ground water hazard index for children is 1.29, with antimony, arsenic and cadmium contributing the majority of the hazard. These metals chiefly affect different target organs; therefore, the hazards would not be additive. The hazard quotients for these individual metals are below the threshold level of one and would not be expected to result in deleterious effects. Table 11 shows the summary of Site carcinogenic and noncarcinogenic health effects for the exposure scenarios evaluated.

Potential carcinogenic risks were evaluated using the cancer slope factors developed by EPA for the contaminants of concern. Cancer slope factors (SFs) have been developed by EPA's Carcinogenic Risk Assessment Verification Endeavor for estimating excess lifetime cancer risks associated with exposure to potentially carcinogenic chemicals. SFs, which are expressed in units of (mg/kg-day), are multiplied by the estimated intake of a potential carcinogen, in mg/kg-day, to generate an upper bound estimate of the excess lifetime cancer risk associated with exposure to the compound at that intake level. The term "upper bound" reflects the conservative estimate of the risks calculated from the SF. Use of this approach makes the underestimation of the risk highly unlikely. The SF for the compounds of concern are presented in Table 12.

For known or suspected carcinogens, EPA considers excess upper bound individual lifetime cancer risks of between 10^{-4} to 10^{-6} to be acceptable. This range indicates that an individual has approximately a one in ten thousand to one in a million chance of developing cancer as a result of site-related exposure to a carcinogen over a 70-year period under specific exposure conditions at the Site. Estimated carcinogenic risks under current and future use scenarios are within or less than EPA's acceptable risk range for both adults and children. The carcinogenic risk for the potential future ground water ingestion exposure pathway is 5.9×10^{-5} for adults and 2.2×10^{-5} for children. The major contaminants contributing to this potential carcinogenic risk are arsenic and beryllium.

Uncertainties

The procedures and inputs used to assess risks in this evaluation, as in all such assessments, are subject to a wide variety of uncertainties. In general, the main sources of uncertainty include:

- environmental chemistry sampling and analysis
- environmental parameter measurement
- fate and transport modeling

- exposure parameter estimation
- toxicological data.

Uncertainty in environmental sampling arises in part from the potentially uneven distribution of chemicals in the media sampled. Consequently, there is significant uncertainty as to the actual levels present. Environmental chemistry analysis error can stem from several sources including the errors inherent in the analytical methods and characteristics of the matrix being sampled.

Uncertainties in the exposure assessment are related to estimates of how often an individual would actually come in contact with the chemicals of concern, the period of time over which such exposure would occur, and in the models used to estimate the concentrations of the chemicals of concern at the point of exposure.

Uncertainties in toxicological data occur in extrapolating both from animals to humans and from high to low doses of exposure, as well as from the difficulties in assessing the toxicity of a mixture of chemicals. These uncertainties are addressed by making conservative assumptions concerning risk and exposure parameters throughout the assessment. As a result, the Risk Assessment provides upper bound estimates of the risks to populations at the Site, and is highly unlikely to underestimate actual risks related to the Site. More specific information concerning public health risks, including a quantitative evaluation of the degree of risk associated with various exposure pathways, is presented in the Risk Assessment Report.

State Acceptance

The State of New York concurs with EPA's selected no action alternative. Their letter of concurrence is attached as Appendix IV.

Community Acceptance

All comments received during the public comment period from July 22, 1992 to August 21, 1992 are summarized in the attached Responsiveness Summary. Although most comments favored the no action decision, several comments disagreed with the decision.

DESCRIPTION OF THE "NO ACTION" REMEDY

Based upon the review of all available data and the findings of the RI conducted at the Site, a no action decision is protective of human health and the environment. The no action decision complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost effective.

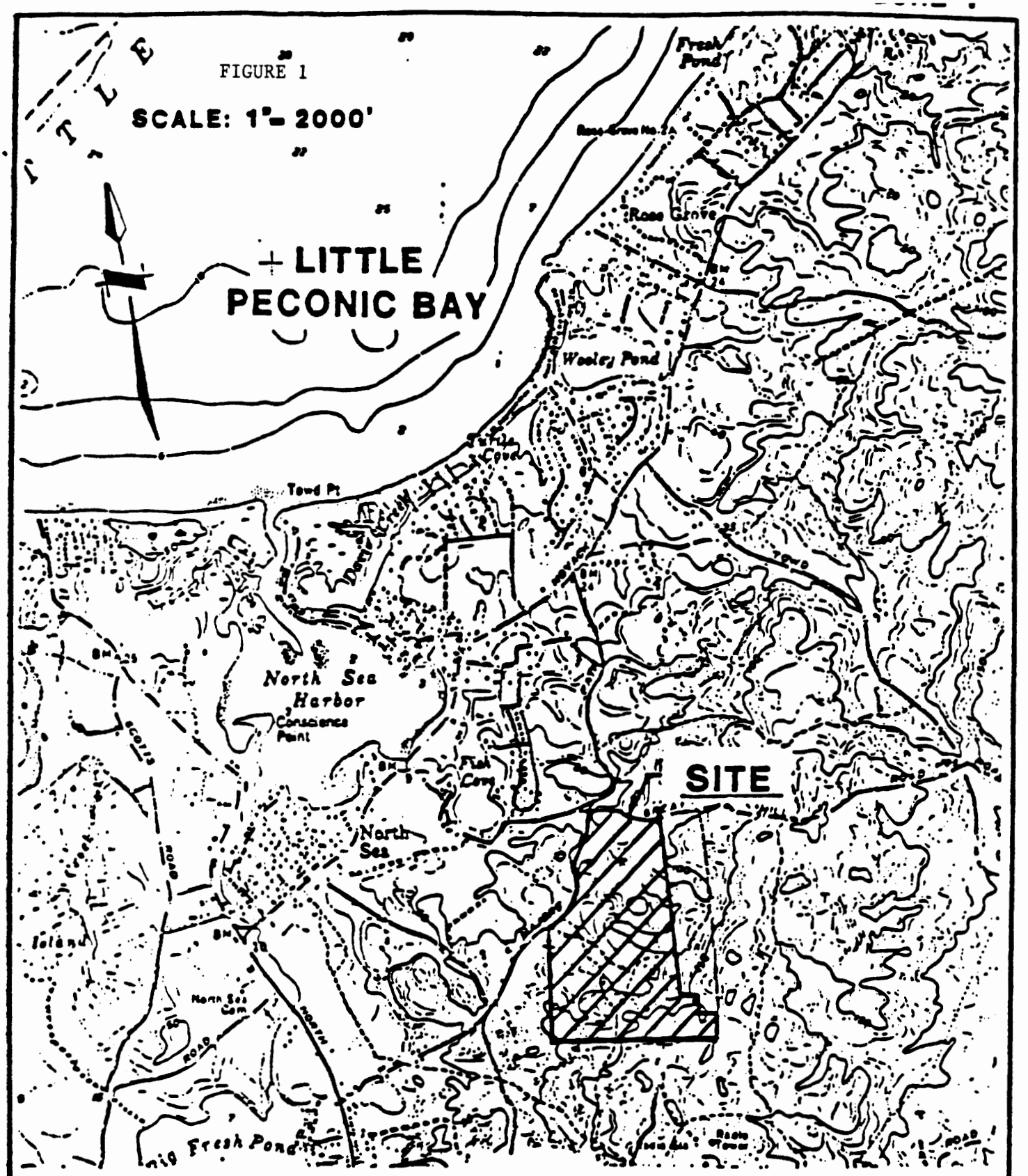
The OU II Risk Assessment indicates that the levels of contaminants present in the ground water at the Site present risks which are within EPA's acceptable risk range. In addition, although ground water sampling results indicate the infrequent occurrence of contaminants exceeding MCLs, the majority of contaminants do not exceed primary (health-based) MCLs in the ground water. In addition, capping of Cell #1 will reduce the risk of contaminant migration from Cell #1 which results from leachate generated by surface precipitation. Furthermore, monitoring of air and water will be conducted to ensure that the cap is effective at reducing the risk of contaminant migration. This monitoring will include sampling of five homes on the periphery of the plume and/or connection to the public water supply. Currently, all homes within the plume have been connected to the public water supply. In addition, ammonia flux measurements and benthos and hard clams recruitment will be conducted at Fish Cove.

Although a five year review will be conducted at the landfill pursuant to the OU I ROD, no five-year review is required for OU II because no hazardous substances have been identified in this OU above health-based levels.

DOCUMENTATION OF SIGNIFICANT CHANGES

There are no significant changes from the preferred alternative presented in the Proposed Plan.

APPENDIX I

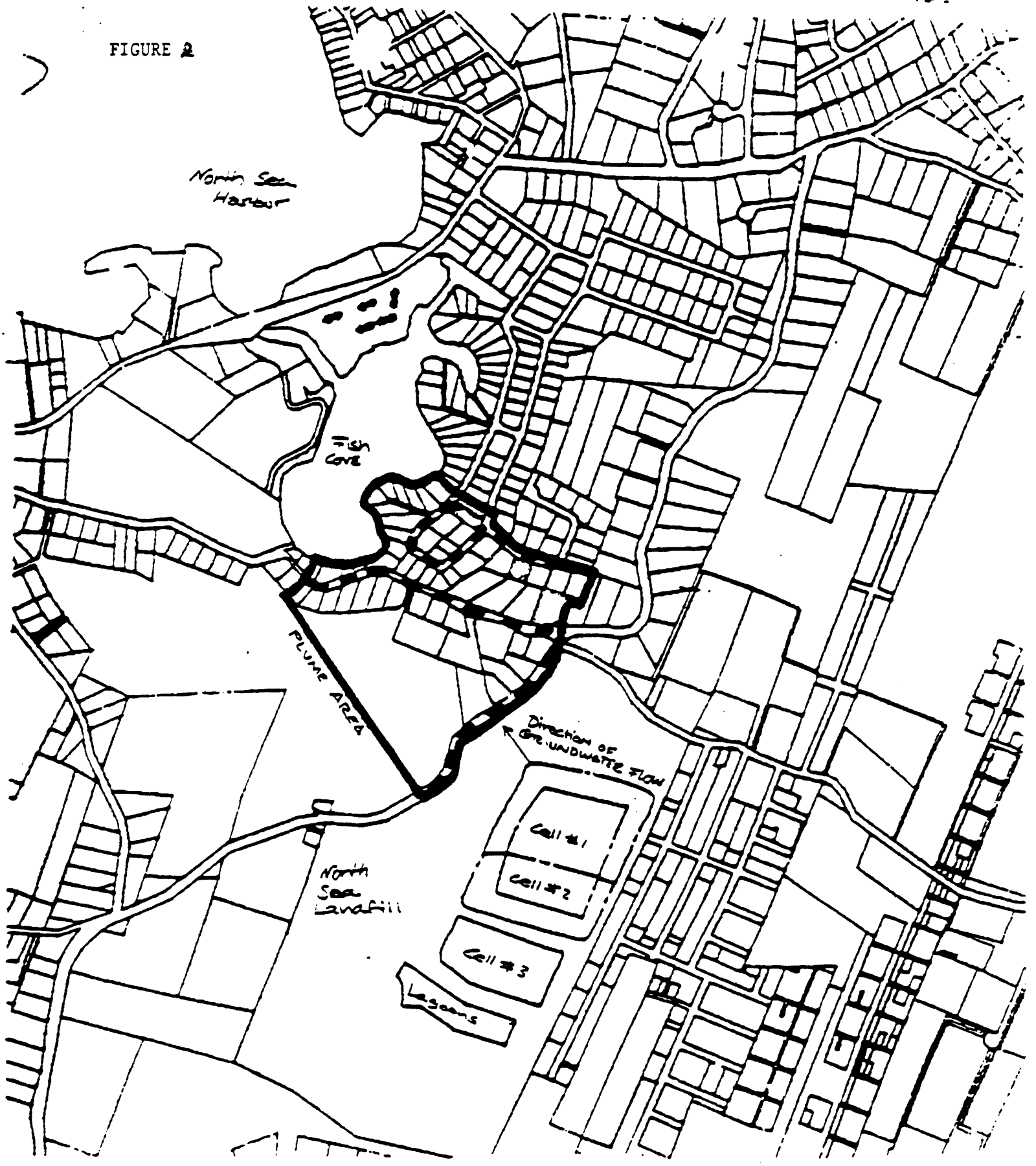


NORTH SEA LANDFILL LOCATION MAP

SOURCE: USGS SOUTHAMPTON QUADRANGLE, 1958

H2M GROUP ENGINEERS • ARCHITECTS • PLANNERS • SCIENTISTS
MELVILLE, N.Y. RIVERHEAD, N.Y. FAIRFIELD, N.J.

FIGURE 2



Residences Downgradient of Cell No. 1

Existing Public Water Main

FIGURE 3

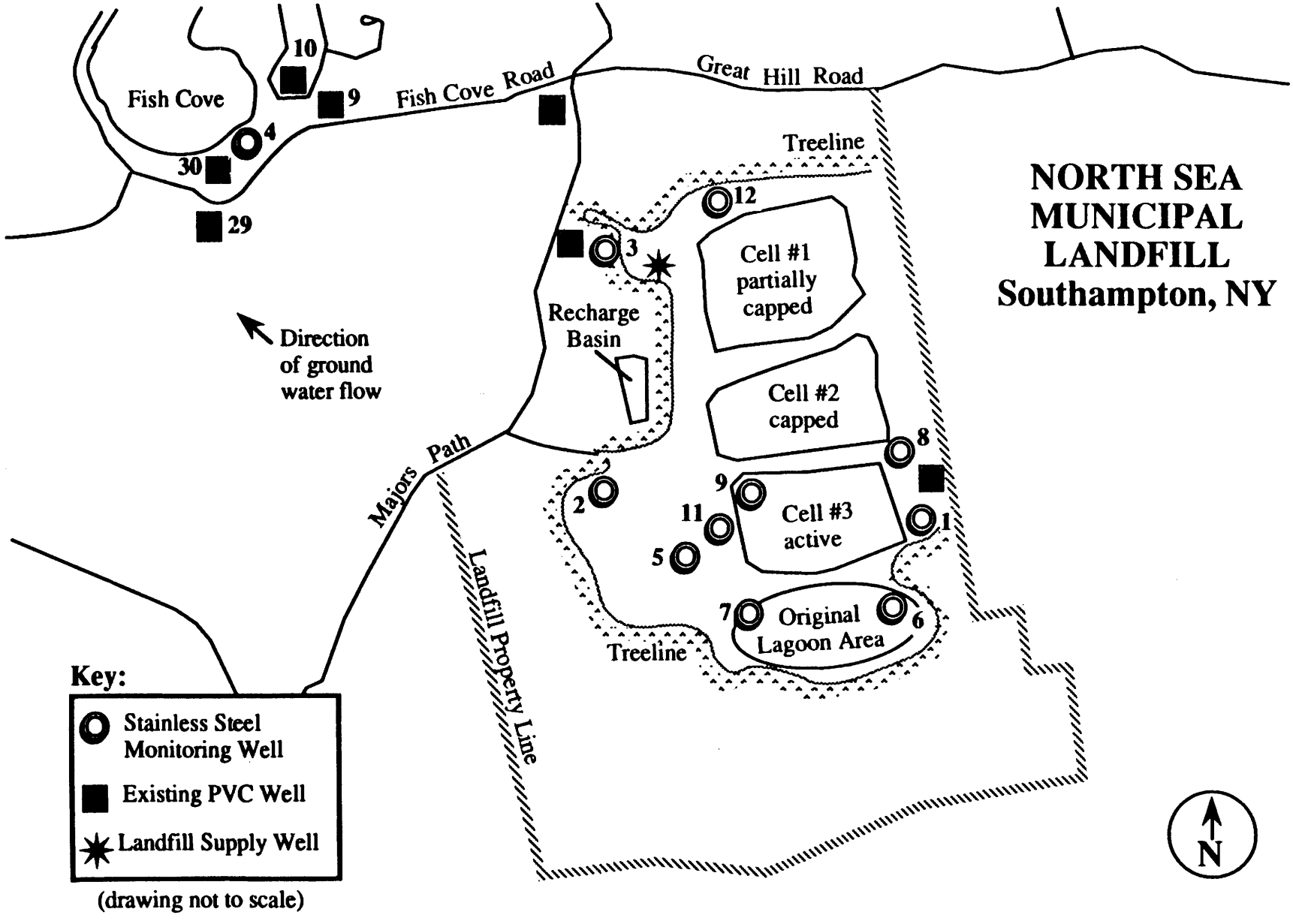
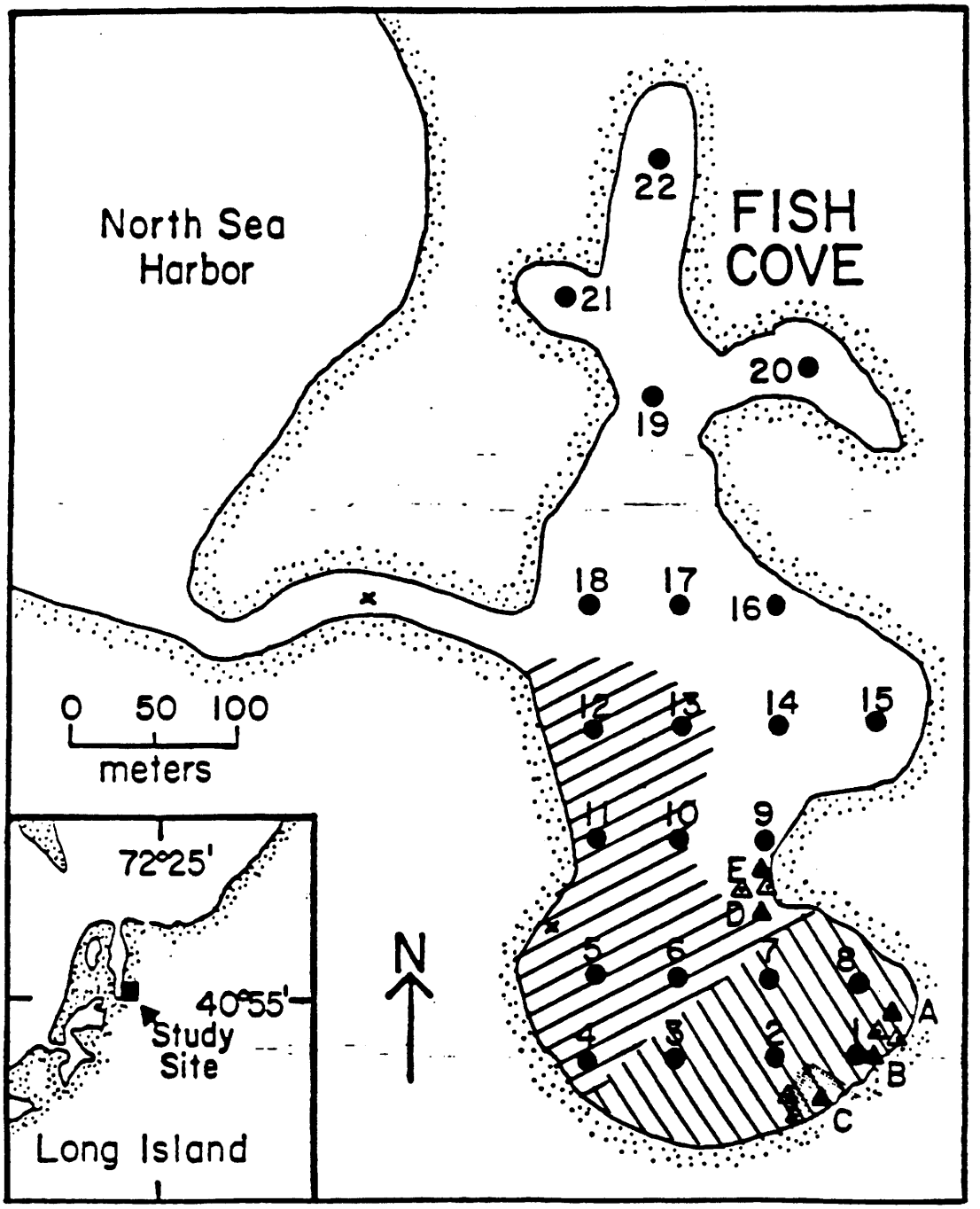

NORTH SEA
MUNICIPAL
LANDFILL
Southampton, NY
Fish Cove
Fish Cove Road
Great Hill Road
Treeline
Cell #1
partially
capped
Recharge
Basin
Cell #2
capped
Cell #3
active
Original
Lagoon Area
Treeline
Majors Path
Landfill Property Line
Direction
of ground
water flow
10
9
4
30
29
12
3
8
2
9
11
5
1
7
6
Key:
Stainless Steel
Monitoring Well
Existing PVC Well
Landfill Supply Well
(drawing not to scale)
N

FIGURE 4

NORTH SEA PHASE II RI FISH COVE STUDY AREA



LEGEND

- ● SURFACE WATER SAMPLING LOCATIONS (SUNY)
- ▲ SEDIMENT SAMPLING LOCATIONS (SUNY)
- ◬ SURFACE WATER/SEDIMENT SAMPLING LOCATIONS (H2M)
- × CLAM SAMPLING LOCATIONS (H2M)

THE STIPPLED REGION INDICATES THE AREAL EXTENT OF THE GROUNDWATER DISCHARGE AREA, INFERRED FROM THE PRESENCE OF IRON-STAINED BOTTOM SEDIMENTS.

- TRANSITION ZONE
- IMPACTED ZONE

H2MGROUP ENGINEERS • ARCHITECTS • PLANNERS • SCIENTISTS • SURVEYORS
MELVILLE, N.Y. RIVERHEAD, N.Y. FAIRFIELD, N.J.

APPENDIX II

TABLE 1

NORTH SEA LANDFILL
METALS - TOTAL
JUNE, 1991
MG/L

PARAMETER	MW1A	MW1B	MW1C	MW2	MW3A	MW3B
ALUMINUM	.40 N	.30 N	.50 N	2.90 N	2.10 N	.30 N
ANTIMONY	U	.40 B	U	U	U	U
ARSENIC	U	U	U	.003 BW	U	.037
BARIUM	.089 B	.026 B	.032 B	.166 B	.032 B	.258
BERYLLIUM	U	U	U	.004 B	<.001 B	.001 B
CADMIUM	U	U	U	.011	U	U
CALCIUM	8.5	4.48 B	8.99	194	4.25 B	32.4
CHROMIUM	0.3	.020	.180	16.7	.114	.031
COBALT	U	U	U	.162	U	.008 B
COPPER	.029	.043	.090	.302	.016 B	.036
IRON	2.41	1.68	2.65	179	7.89	47.6
LEAD	.008	.026	.014	.160	.008	.005
MAGNESIUM	6.06	1.48 B	1.87 B	55.20	2.45 B	14.2
MANGANESE	2.48	.041	.032	5.61	.063	2.88
MERCURY	U	U	U	.0016	U	U
NICKEL	.031 B	.040	.036 B	9.55	U	.032 B
POTASSIUM	1.68 B	1.06 B	.764 B	8.95	.814 B	31.2
SELENIUM	U	U	U	U	U	U
SILVER	U	U	U	U	U	U
SODIUM	8.06	7.39	6.94	2630	19.5	41.6
THALLIUM	U	.002 B	U	.024 B	U	U
VANADIUM	U	U	U	.112	.007 B	.008 B
ZINC	.031	.088	.101	.203	.056	.060

TABLE 1 CONT'D

NORTH SEA LANDFILL
METALS - TOTAL
JUNE, 1991
MG/L

PARAMETER	MW3C	MW4A	MW4B	MW4C	MW6A	MW12A
ALUMINUM	.50 N	.50 N	.20 N	U	.40 N	5.20 N
ANTIMONY	U	U	U	U	U	U
ARSENIC	U	U	U	U	.007 B	.015
BARIUM	.05 B	.036 B	.186 B	.001 B	.108 B	.299
BERYLLIUM	.001 B	<.001 B	.001 B	<.001 B	<.001 B	.002 B
CADMIUM	U	U	U	U	U	U
CALCIUM	44.2	6.04	19.3	6.63	29.8	82.9
CHROMIUM	.211	.034	.035	.053	.020	1.0
COBALT	U	U	U	U	.009 B	.031 B
COPPER	.042	.016 B	.024 B	.027	.068	.104
IRON	3.66	1.29	3.37	1.2	6.41	51.5
LEAD	.013	.002 B	.004	.003	.015	.037
MAGNESIUM	6.80	3.02 B	10.2	2.89 B	9.35	23.9
MANGANESE	.161	.489	1.45	.024	.418	.484
MERCURY	U	U	U	U	U	U
NICKEL	.309	U	.03 B	.036 B	.068	.09
POTASSIUM	1.31 B	1.52 B	12.4	.582 B	2.49 B	55
SELENIUM	U	U	U	U	U	U
SILVER	U	U	U	U	U	U
SODIUM	11.9	15.7	37.7	6.93	17.1	48.5
THALLIUM	U	U	U	U	U	U
VANADIUM	U	U	U	U	U	.047 B
ZINC	.114	.049	.085	.198	.068	.069

H2MGROUP

TABLE 1 CONT'D

NORTH SEA LANDFILL
METALS - TOTAL
JUNE, 1991
MG/L

PARAMETER	MW12B	MW13*	FIELD BLANK 1	FIELD BLANK 2	EPA(a)	NYSDEC(b)
ALUMINUM	1.80 N	.30 N	U	U	NA	NA
ANTIMONY	U	U	U	U	NA	NA
ARSENIC	.009 B	U	U	U	.05	.025
BARIUM	.043 B	.03 B	U	U	2	1
BERYLLIUM	<.001 B	U	<.001 B	<.001 B	NA	NA
CADMIUM	U	U	U	U	0.005**	.01
CALCIUM	19.40	8.36	U	U	NA	NA
CHROMIUM	1.31	.13	U	U	.10**	.05
COBALT	U	U	U	U	NA	NA
COPPER	.086	.074	.015 B	.013 B	1	.20
IRON	21.8	2.10	U	.025 B	0.3	0.3
LEAD	.025	.011	.001 B	U	.05/ .015**	.025
MAGNESIUM	4.92 B	1.83 B	U	.043 B	NA	NA
MANGANESE	.279	.029	U	U	.05	0.3
MERCURY	U	U	U	U	.002	.002
NICKEL	.066	.058	U	U	NA	NA
POTASSIUM	7.36	.812 B	.709 B	.499 B	NA	NA
SELENIUM	U	U	U	U	.01	.01
SILVER	U	.005 B	U	U	.10**	.05
SODIUM	15.2	6.51	.628 B	.673 B	NA	20
THALLIUM	U	U	U	U	NA	NA
VANADIUM	U	U	U	U	NA	NA
ZINC	.167	.079	.039	.022	5	0.30

U - Undetected
B - Entered if reported value is less than the Contract Required Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL)
N - Matrix Spike not within limits
(a) - USEPA Drinking Water Standards, Maximum Contaminant Levels (MCL), 40 CFR 141, February, 1992
(b) - NYSDEC Water Quality Regulations 6 NYCRR Part 703, September, 1991
NA - Not Applicable
* - Blind Duplicate
** - The USEPA cleanup level for lead in groundwater is 15 ppb
The USEPA MCL for cadmium, chromium and silver become effective July, 1992.

TABLE 1A

NORTH SEA LANDFILL
METALS-DISSOLVED
JUNE 1991
MG/L

PARAMETER	MW1A	MW1B	MW1C	MW2	MW3A	MW3B
ALUMINUM	U	U	U	.40 N	0.70 N	0.20 N
ANTIMONY	U	U	U	U	U	U
ARSENIC	U	U	U	U	U	.017
BARIUM	.083 B	.017 B	.015 B	.140 B	.022 B	.227
BERYLLIUM	U	U	U	.003 B	<.001 B	<.001 B
CADMIUM	U	U	U	.009	U	U
CALCIUM	8.12	3.72 B	4.64 B	187	4.83 B	31.0
CHROMIUM	.071	U	.07	11.6	.095	.023
COBALT	U	U	U	.180	U	.006 B
COPPER	.009 B	.014 B	.016 B	.362	.009 B	.011 B
IRON	.324	.072 B	.297	80.2	2.37	41.2
LEAD	.005	.001 B	U	.059 S	.005 B	.005 B
MAGNESIUM	57.7	1.46 B	1.6 B	52	2.46 B	13.6
MANGANESE	2.03	.021	.015 B	5.59	.032	2.82
MERCURY	U	U	U	U	U	U
NICKEL	.053		.042	10.3	.030 B	.032 B
POTASSIUM	1.75 B	1.14 B	.765 B	8.37	.833 B	30.6
SELENIUM	U	U	U	U	<.001 B	U
SILVER	U	U	U	U	U	U
SODIUM	8.50	7.67	6.67	25.2	20.8	41.0
THALLIUM	.002 B	.002 B	U	.028 B	U	U
VANADIUM	U	U	U	.016 B	U	.009 B
ZINC	.025	.058	.042	.189	.046	.067

TABLE 1A CONT'D

NORTH SEA LANDFILL
METALS-DISSOLVED
JUNE 1991
MG/L

PARAMETER	MW3C	MW4A	MW4B	MW4C	MW6A	MW12A
ALUMINUM	.2 N	.2 N	U	U	.20 N	4.3 N
ANTIMONY	U	U	U	U	U	U
ARSENIC	U	.003 B	.003 B	.003 B	.006 B	.013
BARIUM	.041 B	.027 B	.225	.011 B	.092 B	.184 B
BERYLLIUM	<.001 B	<.001 B	.001 B	<0.10 B	<.001 B	.001 B
CADMIUM	U	U	U	U	U	U
CALCIUM	36.3	5.9	22.8	7.38	23	75.1
CHROMIUM	.028	.015	.019	.079	.009 B	.318
COBALT	U	U	U	U	U	.023 B
COPPER	.010 B	.005 B	.009 B	.021 B	.018 B	.046
IRON	.632	.200	2.71	.890	5.22	11
LEAD	.006	.006	.001 B	.006	.007	.010
MAGNESIUM	6.57	2.38 B	11.9	2.89 B	9.54	22.1
MANGANESE	.124	.268	1.67	.035	.400	.354
MERCURY	U	U	U	U	U	U
NICKEL	.237	U	.026 B	.054	U	.222
POTASSIUM	1.49 B	1.22 B	15.1	.706 B	2.91 B	52.1
SELENIUM	U	U	U	U	U	U
SILVER	.020	U	.020	U	U	U
SODIUM	10.9	11.9	44.3	6.83	18	50.4
THALLIUM	U	U	U	U	U	U
VANADIUM	U	U	U	U	U	.021 B
ZINC	.07	.055	.091	.310	.164	.046

H2MGROUP

TABLE 1A CONT'D

NORTH SEA LANDFILL
METALS-DISSOLVED
JUNE 1991
MG/L

PARAMETER	12B	MW13*	FIELD BLANK 1	FIELD BLANK 2	EPA (a)	NYSDEC (b)
ALUMINUM	.50 N	U	U	U	NA	NA
ANTIMONY	U	U	U	U	NA	NA
ARSENIC	.008 B	U	U	U	.05	.025
BARIUM	.022 B	.011 B	U	U	2	1
BERYLLIUM	U	U	<.001 B	<.001 B	NA	NA
CADMIUM	U	U	U	U	.005**	.01
CALCIUM	28.6	3.97 B	U	U	NA	NA
CHROMIUM	.091	.016	.095	.020	.10**	.05
COBALT	U	U	U	U	NA	NA
COPPER	.035	.012 B	.008 B	.009 B	1	.20
IRON	.795	.055 B	.599	.088 B	0.3	0.3
LEAD	.003 B	U	U	.002 B	.05/ .015**	.025
MAGNESIUM	3.62 B	1.63 B	U	U	NA	NA
MANGANESE	.059	.007 B	.010 B	U	.05	0.3
MERCURY	U	U	U	U	.002	.002
NICKEL	.061	.021	.088	U	NA	NA
POTASSIUM	13.2	.645 B	1.22 B	.753 B	NA	NA
SELENIUM	U	U	U	U	.01	.01
SILVER	U	U	U	U	.10**	.05
SODIUM	23	.654	.384 B	.276 B	NA	20
THALLIUM	U	U	U	U	NA	NA
VANADIUM	U	U	U	U	NA	NA
ZINC	.035	.039	.039	.011 B	5	0.3

U - Undetected
B - Entered if reported value is less than the Contract Required Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL)
(a) - USEPA Drinking Water Standards, Maximum Contaminant Levels (MCL), 40 CFR 141, February, 1992
(b) - NYSDEC Water Quality Regulations 6 NYCRR Part 703, September, 1991
* - Blind Duplicate
** - The USEPA cleanup level for lead in groundwater is 15 ppb
The USEPA MCL for cadmium, chromium and silver became effective July 1992

TABLE 2

NORTH SEA LANDFILL
VOLATILE ORGANICS
JUNE 1991

RAMETER	MW1A	MW1B	MW1C	MW2	MW3A	MW3B	MW3C	MW4A	MW4B	MW4C	MW6A	MW12A	MW12B	MW13*	FIELD BLANK 1	FIELD BLANK 2	EPA (a)	NYSDEC (b)
OLATILE ORGANICS																		
/L																		
HLOROMETHANE	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	NA	NA
ROMOMETHANE	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	NA	NA
NYL CHLORIDE	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	2	NA
HLOROETHANE	U	U	U	4	U	U	U	U	U	U	U	U	U	U	U	U	NA	NA
THYLENE CHLORIDE	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	NA	NA
ETONE	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	NA	NA
RBON DISULFIDE	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	NA	NA
,1-DICHLOROETHENE	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	7	NA
,1-DICHLOROETHANE				2			U	U	U	U	U	U	U	U	U	U	7	5
,2-DICHLOROETHENE (TOTAL)	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	NA	NA
HLOROFORM		2	2				U	U	U	U	U	U		2			NA	NA
,2-DICHLOROETHANE	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	NA
-BUTANONE	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	NA	NA
,1,1-TRICHLOROETHANE	U	U	U	2	U	U	U	U	U	U	U	16 B	1				200	5
RBON TETRACHLORIDE	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	NA
ROMODICHLOROMETHANE	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	NA	NA
,2-DICHLOROPROPANE	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	NA
is-1,3-DICHLORO-PROPANE	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	NA	NA
RICHLOROETHENE	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	NA
IBROMOCHLOROMETHANE	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	NA	NA
,1,2-TRICHLOROETHANE	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	NA	NA
ENZENE	U	U	U	U	U	1	U	U	U	U	U	U	U	U	U	U	5	0.7
rans-1,3-DICHLORO-PROPANE	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	NA	NA
ROMOFORM	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	NA	NA
-METHYL-2-PENTANONE	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	NA	NA
-HEXANONE	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	NA	NA
ETRACHLOROETHENE	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	NA	NA
,1,2,2-TETRACHLORO-ETHANE	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	NA	NA
OLUENE	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	1000	NA
HLOROBENZENE	U	U	U	U	U	4	U	U	U	U	U	U	U	U	U	U	NA	5
,1,2-TRICHLORO-122 TRIFLUOROETHANE	U	U	U	U	U	U	U	U	2 J	2 J	2 J	U	U	U	U	U	NA	NA
CTANE ISOMER	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	NA	NA
THYLBENZENE	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	NA	5
TYRENE	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	100	NA
YLENE (TOTAL)	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	10,000	NA
,3-DICHLOROBENZENE	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	NA	NA
,4-DICHLOROBENZENE	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	NA	5
,2-DICHLOROBENZENE	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	NA	NA
,2-DIBROMO-3-CHLORO-PROPANE	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	NA	NA
,2-DIBROMOETHANE	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	NA	NA

U - Undetected
B - Entered if reported value is less than the Contract Required Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL)
N - Matrix Spike not within limits

(a) - USEPA Drinking Water Standards, Maximum Contaminant Levels (MCL), 40 CFR 141, February, 1992
(b) - NYSDEC Water Quality Regulations 6 NYCRR Part 703, September, 1991
NA - Not Applicable
* - Blind Duplicate

TABLE 3

NORTH SEA LANDFILL
WELLS 12A/12B
SEPTEMBER 1991
METALS TOTAL AND DISSOLVED

	MW 12A		MW 12B	
PARAMETER	TOTAL	DISSOLVED	TOTAL	DISSOLVED
Aluminum	.555	.128 B	1.41	.088 B
Antimony	.031 B	U	U	U
Arsenic	.02	.003 B	.007 B	.003 B
Barium	.483	.215	.053 B	.033 B
Beryllium	<.001 B	<.001 B	<.001 B	<.001 B
Cadmium	.019	U	.008	U
Calcium	73.4	68.8	22.5	23.2
Chromium	.237 N	.011	.332	U
Cobalt	U	U	.013 B	.007 B
Copper	.038	.02 B	.060	.011 B
Iron	110	3.70	12.9	1.31
Lead	.004	.002 B	.011	U
Magnesium	15.70	15	6.34	5.44
Manganese	2.25	1.95	.333	.209
Mercury	U	U	U	U
Nickel	.165	.03 B	.207	U
Potassium	33.5	31.6	9.16	7.85
Selenium	<.001 B	U	<.001 B	U
Silver	U	U	U	U
Sodium	32	30.7	15.5	14.6
Thallium	U	U	U	U
Vanadium	.017 B	U	U	U
Zinc	.045	.043	.069	.03

H2MGROUP

TABLE 3 CONT'D

NORTH SEA LANDFILL
WELLS 12A/12B
SEPTEMBER 1991
METALS TOTAL AND DISSOLVED

	MW 12C*					
PARAMETER	TOTAL	DISSOLVED	FIELD BLANK TOTAL	RINSE BLANK TOTAL	EPA (a)	NYSDEC (b)
Aluminum	1.10	.071 B	.197 B	.04 B	NA	NA
Antimony	U	U	U	U	NA	NA
Arsenic	.007 B	.004 B	U	U	.05	.025
Barium	.053 B	.033 B	U	U	2	1
Beryllium	<.001 B	<.001 B	<.001 B	U	NA	NA
Cadmium	U	.012	U	U	.005**	.01
Calcium	20.4	22.5	U	U	NA	NA
Chromium	.273	U	U	U	.10**	.05
Cobalt	.01 B	U	U	.008 B	NA	NA
Copper	.049	.054	.01 B	.027	1	.20
Iron	12.1	2.46	.163	.034 B	0.3	0.3
Lead	.01	U	U	.001 B	.05 .015**	.025
Magnesium	6.38	5.44	.038 B	U	NA	NA
Manganese	.337	.232	U	U	.05	.3
Mercury	U	U	U	U	.002	.002
Nickel	.170	U	U	U	NA	NA
Potassium	9.44	7.48	.375 B	1.38 B	NA	NA
Selenium	U	U	U	U	.01	.01
Silver	U	.011 N	U	.005 B	.10**	.05
Sodium	15.7	13.2	.645 B	1.57 B	NA	20
Thallium	U	U	U	U	NA	NA
Vanadium	U	U	U	U	NA	NA
Zinc	.079	.024	.011 B	1.21	5	0.30

U - Undetected
B - Entered if reported value is less than the Contract Required Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL)
N - Matrix Spike not within limits
(a) - USEPA Drinking Water Standards, Maximum Contaminant Levels (MCL), 40 CFR 141, February, 1992
(b) - NYSDEC Water Quality Regulations 6 NYCRR Part 703, September, 1991
NA - Not Applicable
* - Blind Duplicate
** - The USEPA cleanup level for lead in groundwater is 15 ppb
The USEPA MCL for cadmium, chromium and silver became effective July 1992

TABLE 4

NORTH SEA LANDFILL
WELLS 12A/12B
SEPTEMBER 1991 SAMPLING
QUANTIFIED ORGANICS

PARAMETER (µG/L)	MW 12A	MW 12B	MW 12C*	FIELD BLANK	TRIP BLANK	EPA (a)	NYSDEC (b)
CHLOROMETHANE	U	U	U	U	U	NA	NA
BROMOMETHANE	U	U	U	U	U	NA	NA
VINYL CHLORIDE	U	U	U	U	U	2	NA
CHLOROETHANE	U	U	U	U	U	NA	NA
METHYLENE CHLORIDE	2B	14B	17B	2B	U	NA	5
ACETONE	U	U	U	U	16	NA	NA
CARBON DISULFIDE	U	U	U	U	U	NA	NA
1,1-DICHLOROETHENE	U	U	U	U	U	7	NA
1,1-DICHLOROETHANE	U	U	U	U	U	7	5
1,2-DICHLOROETHENE (TOTAL)	U	U	U	U	U	NA	NA
CHLOROFORM	U	U	U	U	U	NA	NA
1,2-DICHLOROETHANE	U	U	U	U	U	5	NA
2-BUTANONE	U	U	U	U	U	NA	NA
1,1,1-TRICHLOROETHANE	U	U	U	U	U	200	5
CARBON TETRACHLORIDE	U	U	U	U	U	5	NA
BROMODICHLOROMETHANE	U	U	U	U	U	NA	NA
1,2-DICHLOROPROPANE	U	U	U	U	U	5,	NA
cis-1,3-DICHLORO-UU PROPANE	U	U	U	U	U	NA	NA
TRICHLOROETHENE	U	U	U	U	U	5	NA
DIBROMOCHLOROMETHANE	U	U	U	U	U	NA	NA
1,1,2-TRICHLOROETHANE	U	U	U	U	U	NA	NA
BENZENE	4	U	U	U	U	5	0.7
trans-1,3-DICHLORO-U PROPANE	U	U	U	U	U	NA	NA
BROMOFORM	U	U	U	U	U	NA	NA
4-METHYL-2-PENTANONE	U	U	U	U	U	NA	NA
2-HEXANONE	U	U	U	U	U	NA	NA
TETRACHLOROETHENE	U	U	U	U	U	NA	NA
1,1,2,2-TETRACHLORO-ETHANE	U	U	U	U	U	NA	NA
TOLUENE	U	U	U	U	U	1000	NA
CHLOROBENZENE	8	U	U	U	U	NA	5
ETHYLBENZENE	10	U	U	U	U	NA	5
STYRENE	U	U	U	U	U	100	NA
XYLENE (TOTAL)	U	U	U	U	U	19,000	NA
1,3-DICHLOROBENZENE	U	U	U	U	U	NA	NA
1,4-DICHLOROBENZENE	11	2	1	U	U	NA	5
1,2-DICHLOROBENZENE	U	U	U	U	U	NA	NA
1,2-DIBROMO-3-CHLORO-PROPANE	U	U	U	U	U	NA	NA
1,2-DIBROMOMETHANE	U	U	U	U	U	NA	NA

U - Undetected
B - Entered if reported value is less than the Contract Required Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL)
N - Matrix Spike not within limits
(a) - USEPA Drinking Water Standards, Maximum Contaminant Levels (MCL), 40 CFR 141, February, 1992
(b) - NYSDEC Water Quality Regulations 6 NYCRR Part 703, September, 1991
NA - Not Applicable
* - Blind Duplicate

TABLE 5

RESIDENTIAL WELL SURVEY SEPTEMBER 1991

mg/l

TOTAL METALS

LOCATION	ALUMINUM	ANTIMONY	ARSENIC	BARIUM	BERYLLIUM	CADMIUM	CALCIUM	CHROMIUM	COBALT	COPPER	IRON	LEAD	MAGNESIUM	MANGANESE	MERCURY	NICKEL	POTASSIUM	SELENIUM	SILVER	SODIUM	THALLIUM	VANADIUM	ZINC	CYANIDE
SWANSON	.09	.04	U	.02	U	U	4.27	U	U	.05	.15	.006	2.18	.006	U	U	.57	U	.005	6.78	U	U	.692	U
BEGY	.03	U	U	.03	U	U	4.68	U	U	.11	.17	.005	2.24	.007	U	U	.72	U	U	12.9	U	U	.19	U
APPUZO	.03	.04	U	.04	U	U	2.39	U	U	.17	(.46)	.006	1.74	.03	U	U	.74	U	U	14.7	.002	U	.25	U
BRADLEY	.06	U	U	.04	U	U	2.57	U	U	.06	.20	.01	1.27	.02	U	U	.43	U	.01	5.55	U	U	.384	U
KIRK	U	U	U	.03	U	U	2.43	U	U	.03	.17	.007	1.37	.005	U	U	.40	U	.005	5.43	U	U	.04	U
MITSUTA	.03	U	U	.16	U	U	10.6	U	.008	.01	(14.7)	.008	4.82	(1.18)	U	U	5.08	U	U	10.5	U	U	.21	U
FINNERTY	.04	U	U	.03	U	.005	3.07	U	U	.04	.30	.004	1.64	.02	U	U	.64	U	U	10.4	U	U	.369	U
ZORKO	U	U	U	.03	U	U	3.54	U	U	.14	(.63)	.008	1.64	.02	U	.02	.62	U	U	6.66	U	U	.22	U
REIGLER	.03	U	U	.04	U	U	6.55	U	U	.314	(.537)	(.02)	5.76	.09	U	U	.56	U	U	8.02	U	U	.07	U
LAVINO	.04	U	U	.06	U	.008	3.37	U	U	.02	.16	(.02)	1.74	.02	U	U	.59	U	U	6.36	U	U	(7.01)	U
ALUSKEWICZ	.03	U	U	.05	U	U	3.49	U	U	.10	(.37)	.01	1.75	.02	U	U	.57	U	U	6.83	U	U	.06	U
CASSIDY	.02	U	U	.04	U	U	2.01	U	U	.16	.12	.008	2.31	.01	U	U	.70	U	U	8.32	U	U	.095	U
BEGG	.03	U	U	.04	U	U	3.71	U	U	.007	.21	.004	1.9	.004	U	U	.58	U	.02	6.95	U	U	.08	U
CASTLE*	.04	.03	U	.04	U	U	6.61	U	U	.241	(7.98)	.005	5.77	.12	U	U	.55	U	U	7.87	U	U	.09	U
NYS SANITARY CODE DRINKING WATER SUPPLY (1)	NA	NA	0.05	1.0	NA	0.01	NA	0.05	NA	1.0	(2) ·0.3	0.05	NA	(2) 0.3	0.002	NA	NA	0.01	0.05	NA	NA	NA	5.0	NA
FEDERAL DRINKING WATER STANDARDS (3)	NA	NA	0.05	2.0	NA	.005	NA	0.10	NA	1.0	0.3	005/ 0015 **	NA	0.5	0.002	NA	NA	0.01	0.10	NA	NA	NA	5.0	NA

U = UNDETECTED
NA = NOT APPLICABLE
* = BLIND DUPLICATE
** = USEPA CLEANUP LEVEL FOR LEAD IS 15 PPB

(1) NYS MAXIMUM CONTAMINANT LEVELS CHAPTER 1 OF THE NYS SANITARY CODE, PARTS, SUBPART 5-1 (FEB. 1992)

(2) IF IRON AND MANGANESE ARE PRESENT TOTAL CONCENTRATION OF BOTH SHOULD NOT EXCEED 0.5 mg/l

(3) USEPA DRINKING WATER STANDARDS MAXIMUM CONTAMINANT LEVELS (MCL) 40 CFR 141 (FEB. 1992)

SHEET0104 WELLSURV.DWG

H2MGROUP ENGINEERS · ARCHITECTS · PLANNERS · SCIENTISTS · SURVEYORS
MELVILLE, N.Y. TOTOWA, N.J.

TABLE 5 Cont'd

RESIDENTIAL WELL SURVEY SEPTEMBER 1991

	INORGANICS						ORGANICS	
LOCATION	CHLORIDE mg/l	AMMONIA mg/l	NITRITE mg/l	NITRATE mg/l	TOTAL PHENOLS µg/l	TOTAL DISSOLVED SOLIDS mg/l	CHLOROFORM µg/l	ACETONE µg/l
SWANSON	12	< 0.02	< 0.1	< 0.01	< 1	82		
BEGY	20	0.81	< 0.1	1.3	< 1	70		
APPUZO	18	0.02	< 0.1	0.5	< 1	63		
BRADLEY	7	< 0.02	< 0.1	< 0.1	< 1	40		
KIRK	8	< 0.02	< 0.1	< 0.1	< 1	35	2	
MITSUTA	11	0.87	< 0.1	0.7	< 1	127		
FINNERTY	19	< 0.02	< 0.1	< 0.1	< 1	58		8
ZORKO	11	< 0.02	< 0.1	0.1	< 1	40	1	
REIGLER	11	< 0.02	< 0.1	1.2	< 1	82		
LAVINO	8	< 0.02	< 0.1	0.4	< 1	50		
ALUSKEWICZ	8	< 0.02	< 0.1	< 0.1	< 1	38	1	
CASSIDY	12	< 0.02	< 0.1	0.3	< 1	40		
BEGG	10	< 0.02	< 0.1	0.9	< 1	50		
CASTLE*	8	< 0.02	< 0.1	1.4	< 1	80		
PART 5 NYS SANITARY CODE-DRINKING WATER SUPPLY (1)	250	NA	NA	10	NA	NA	5	5
FEDERAL DRINKING WATER STANDARDS (2)	250	NA	NA	10	NA	500	5	5

* = BLIND DUPLICATE

(1) NYS MAXIMUM CONTAMINANT LEVELS CHAPTER 1 OF THE NYS SANITARY CODE, PART 5, SUBPART 5-1 (FEB. 1992)

(2) USEPA DRINKING WATER STANDARDS MAXIMUM CONTAMINANT LEVELS (MCL) 40 CFR 141 (FEB. 1992)

TABLE 6

BASELINE EMISSIONS ESTIMATES

CONTAMINANT	MAXIMUM SOIL GAS CONCENTRATION ($\mu g/cm^3$)	DIFFUSIVITY IN AIR (cm^2/day)	VOLATILIZATION FLUX ($\mu g/cm^2$-day)	TOTAL EMISSIONS (kg/day)
Toluene	0.0049	7517	9.72E-02	5.83E-02
Methoxy Butene Isomer	0.0046	6912	8.39E-02	5.04E-02
Ethylbenzene	0.0039	6480	6.67E-02	4.00E-02
1,2-Dichloro-1,1,2,2-tetrafluoroethane	0.003	7171	5.68E-02	3.41E-02
1,2-Dichlorobenzene	0.0023	5962	3.62E-02	2.17E-02
Methyl Cyclohexane	0.0016	6912	2.92E-02	1.75E-02
Chlorobenzene	0.0012	6307	2.00E-02	1.20E-02
Chlorodifluoromethane	0.00085	7171	1.61E-02	9.66E-03
Dichlorodifluoromethane	0.00065	7171	1.23E-02	7.38E-03
Benzene	0.00055	8052	1.17E-02	7.01E-03
1,1,1-Trichloroethane	0.00041	6739	7.29E-03	4.38E-03
2-Butene	0.0002	6912	3.65E-03	2.19E-03
2,2,3,4-Tetramethylpentane	0.00016	6912	2.92E-03	1.75E-03
Trichlorofluoromethane	0.00015	7517	2.98E-03	1.79E-03
Alkyl Alkane	0.00011	6912	2.01E-03	1.20E-03
1,2-Dichoroethane	0.0001	7836	2.07E-03	1.24E-03
Acetone	0.000083	10714	2.35E-03	1.41E-03
Chloroethane	0.000049	7171	9.28E-04	5.57E-04
1,2-Dichloroethene	0.000049	7171	9.28E-04	5.57E-04
Vinyl Chloride	0.000038	9331	9.36E-04	5.62E-04
Chloroform	0.000031	7672	6.28E-04	3.77E-04
1,1-Dichloroethene	0.000024	7171	4.54E-04	2.73E-04
Trichloroethene	0.000007	6826	1.26E-04	7.57E-05
Tetrachloroethene	0.000005	6221	8.21E-05	4.93E-05

TABLE 7

AMBIENT AIR IMPACTS

CONTAMINANT	HOURLY EMISSIONS (LBS/HR)	ANNUAL EMISSIONS (LBS/YR)	ACTUAL ANNUAL IMPACT ($\mu g/m^3$)	MAXIMUM POTENTIAL ANNUAL IMPACT ($\mu g/m^3$)	MAXIMUM SHORT-TERM IMPACT ($\mu g/m^3$)	SHORT-TERM AMBIENT GUIDELINE CONCENTRATION (SGC) ($\mu g/m^3$)	LONG-TERM AMBIENT GUIDELINE CONCENTRATION (AGC) ($\mu g/m^3$)	COMPLIANCE STATUS
Toluene	5.37E-03	4.64E+01	1.06E-02	1.08E-02	1.08E+00	89,000	2,000	In Compliance
Methoxy Butene Isomer	4.64E-03	4.01E+01	9.20E-03	9.36E-03	9.36E-01	NA	0.1*	In Compliance
Ethylbenzene	3.68E-03	3.18E+01	7.30E-03	7.43E-03	7.43E-01	103,333	1,033	In Compliance
1,2-Dichloro-1,1,2,2-tetrafluoroethane	3.14E-03	2.71E+01	6.23E-03	6.33E-03	6.33E-01	1,664,286	16,643	In Compliance
1,2-Dichlorobenzene	2.00E-03	1.73E+01	3.96E-03	4.03E-03	4.03E-01	30,000	200	In Compliance
Methyl Cyclohexene	1.61E-03	1.39E+01	3.20E-03	3.25E-03	3.25E-01	380,000	3,800	In Compliance
Chlorobenzene	1.11E-03	9.55E+00	2.19E-03	2.23E-03	2.23E-01	11,000	20	In Compliance
Chlorodifluoromethane	8.90E-04	7.69E+00	1.76E-03	1.79E-03	1.79E-01	9,524	95	In Compliance
Dichlorodifluoromethane	6.80E-04	5.87E+00	1.35E-03	1.37E-03	1.37E-01	1,178,571	11,786	In Compliance
Benzene	6.46E-04	5.58E+00	1.28E-03	1.30E-03	1.30E-01	30	0.12	In Compliance
1,1,1-Trichloroethane	4.03E-04	3.48E+00	8.00E-04	8.13E-04	8.13E-02	450,000	1,000	In Compliance
2-Butene	2.02E-04	1.74E+00	4.00E-04	4.07E-04	4.07E-02	NA	0.1*	In Compliance
Trichlorofluoromethane	1.65E-04	1.42E+00	3.27E-04	3.32E-04	3.32E-02	560,000	700	In Compliance
2,2,3,4-Tetramethylpentane	1.61E-04	1.39E+00	3.20E-04	3.25E-04	3.25E-02	NA	0.1*	In Compliance
Alkyl Alkane	1.11E-04	9.55E-01	2.19E-04	2.23E-04	2.23E-02	NA	0.1*	In Compliance
1,2-Dichoroethane	1.14E-04	9.87E-01	2.26E-04	2.30E-04	2.30E-02	950	0.039	In Compliance
Acetone	1.30E-04	1.12E+00	2.57E-04	2.62E-04	2.62E-02	140,000	14,000	In Compliance
Chloroethane	5.13E-05	4.43E-01	1.02E-04	1.03E-04	1.03E-02	NA	0.1*	In Compliance
1,2-Dichloroethene	5.13E-05	4.43E-01	1.02E-04	1.03E-04	1.03E-02	190,000	1,900	In Compliance
Vinyl Chloride	5.18E-05	4.47E-01	1.03E-04	1.04E-04	1.04E-02	1,300	0.02	In Compliance
Chloroform	3.47E-05	3.00E-01	6.88E-05	7.00E-05	7.00E-03	980	23	In Compliance
1,1-Dichloroethene	2.51E-05	2.17E-01	4.98E-05	5.07E-05	5.07E-03	4,762	48	In Compliance
Trichloroethene	6.97E-06	6.02E-02	1.38E-05	1.41E-05	1.41E-03	33,000	0.45	In Compliance
Tetrachloroethene	4.54E-06	3.92E-02	9.00E-06	9.16E-06	9.16E-04	81,000	0.075	In Compliance

* DeMinimis concentration substituted as no guideline concentration is available for this compound.

TABLE 8

SURFACE WATER CONCENTRATIONS NEAR

SOUTHEAST REGION OF FISH COVE

DATE	STATION	Cl^-*	NH_4^+	Fe	Mn	$HPO_4^=$
5/23/89	1	6	3.56	0.675	1.73	0.003
	2	6	5.49	0.714	3.13	0.006
	3	20	0.922	0.109	0.781	0.005
	4	24	0.441	0.069	0.34	0.007
	5	24	0.419	0.061	0.33	0.005
	6	26	0.189	0.057	0.23	<0.002
	7	26	0.508	0.093	0.33	0.005
	8	24	1.25	0.303	0.583	0.002
	9	26	0.091	0.046	0.18	0.003
	10	28	0.10	0.059	0.21	0.002
	11	26	0.32	0.055	0.27	0.003
	12	28	0.174	0.054	0.25	0.004
	13	28	0.173	0.046	0.22	<0.002
	14	26	0.093	0.055	0.18	0.002
	15	24	0.086	0.005	0.15	0.002
	16	26	0.07	0.041	0.16	0.003
	17	28	0.059	0.041	0.15	<0.002
	18	28	0.029	0.044	0.16	0.003
	19	28	0.024	0.048	0.16	0.006
	20	26	0.043	0.05	0.15	0.004
	21	30	0.017	0.052	0.14	0.003
	22	26	0.034	0.096	0.18	0.002
6/8/89	A	26	0.491	0.121	0.307	--
	B	26	1.87	0.522	0.627	--
	C	20	8.89	1.21	2.22	--
6/15/89	"Beach"	0.4	0.509	0.083	0.699	--
	D	24	0.088	0.028	0.338	--
	E	24	0.051	0.028	0.219	--
State SA(1)		NA	NA	NA	NA	NA
State B(1)		NA	0.015**	0.30	NA	NA
Federal(2)		NA	NA	NA	NA	NA

* Concentrations in 1,000 mg/L; all other results in mg/L

** Based on pH of 7.25 and temperature of 20 degrees C.

(1) 6 NYCRR Part 700-705 - New York State Department of Environmental Conservation, September 1, 1991.

(2) USEPA Criterion Maximum Concentration for Saltwater, November 1991.

TABLE 9

PARAMETERS QUANTIFIED IN FISH COVE SURFACE WATER (UG/L)

	LOCATION				BACKGROUND		STANDARDS	
PARAMETER	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	NYSDEC CLASS SA (1)	FEDERAL (2)
ACETONE	ND	27	26	26	ND	33	NA	NA
BERYLLIUM	3.0B	3.0B	4.0B	4.0B	4.0B	5.0	NA	NA
CADMIUM	ND	ND	ND	ND	ND	7.0	7.7	43
CHROMIUM	ND	13.0	44.0	17.0	ND	ND	54*	NA
COPPER	7.0B	15.0B	8.0B	8.0B	10.0B	5.0B	2.9	2.9
IRON	978E	1490E	968E	499E	338E	617E	NA	NA
MANGANESE	976E	557E	90.0E	129E	109E	156E	NA	NA
SELENIUM	12.0	ND	ND	ND	ND	ND	NA	300
SILVER	10.0	10.0	ND	ND	ND	ND	NA	2.3
ZINC	18.0B	17.0B	20.0	21.0	26.0	22.0	58	95

ND Indicates "Not Detected"
(1) 6 NYCRR Parts 700-705, NYSDEC, September 1, 1991
(2) Saltwater Criterion Maximum Concentation
* Class SA standard for hexavalent chromium
E The reported value is estimated because of the presence of interference
B Entered if the reported value is less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL)

TABLE 10

PARAMETERS QUANTIFIED IN FISH COVE SEDIMENTS

Parameter	Location SD-1	SD-2	SD-3	SD-4	Background SD-5	SD-6
(in µg/kg):						
Methylene Chloride	2J	ND	ND	ND	ND	ND
Acetone	130J	180J	93J	ND	ND	170J
Chloroform	1J	ND	ND	ND	ND	ND
1,1,1-TCA	69	43	33	ND	ND	39
TCE	ND	ND	ND	ND	ND	ND
(in mg/kg):						
Arsenic	ND	.40BN	.36BN	1.1N	.33BN	ND
Cadmium	ND	ND	1.6	1.4	ND	ND
Chromium	3.5	ND	2.7	4.9N	ND	2.2B
Copper	3.8B	1.0B	2.4B	3.3BN	2.9B	1.5B
Iron	1400	3600	1800	3100	1700	1000
Lead	1.6	1.7	1.8	4.9	1.9	1.8
Manganese	61.0	24.0	22.0	17.0	200	200
Nickel	ND	29.0	ND	ND	ND	ND
Thallium	.76B*N	1.4B*N	.53B*WN	.66B*WN	.50BN*	6.6BN*
Zinc	8.6	4.4	9.1	13.5N*	4.0	3.1B
Phenols	ND	ND	ND	ND	.581	ND

ND indicates "Not Detected"

TABLE 1-1

CONTAMINANT CONCENTRATION TO FISH COVE
THROUGH GROUND WATER SEEPAGE FROM NORTH SEA LANDFILL
(DETERMINED BY SOCEM)

CONTAMINANT	Wells near Fish Cove (ug/L)
AMMONIA	1722.251
ANTIMONY	5.775
ARSENIC	1.817
BARIUM	26.589
BERYLLIUM	0.430
CADMIUM	1.366
CHROMIUM III	38.816
CHROMIUM VI	6.469
MANGANESE	158.183
NICKEL	23.608
VANADIUM	3.932
ZINC	33.296

TABLE 12

CRITICAL TOXICITY VALUES FOR ORAL ROUTE

CHEMICAL	RfD * (mg/kg-day)	RfDs ** (mg/kg-day)	SF*** 1/(mg/kg-day)	Weight of Evidence Classification
Ammonia(NC)	9.71E-01 (4)	NA	NA	NA
Antimony(NC)	4.00E-04 (3)	4.00E-04 (2)	NA	NA
Arsenic (NC)	3.00E-04 (3)	1.00E-03 (2)	NA	NA
Arsenic (C)	NA	NA	1.75E+00 (1)	A
Barium(NC)	7.00E-02 (3)	5.00E-02 (2)	NA	NA
Beryllium (NC)	5.00E-03 (3)	5.00E-03 (2)	NA	NA
Beryllium (C)	NA	NA	4.30E+00 (3)	B2
Cadmium(NC)	5.00E-04 (3)	NA	NA	NA
Chromium III(NC)	1.00E+00 (2)	1.00E+01 (2)	NA	NA
Chromium VI(NC)	5.00E-03 (3)	2.00E-02 (2)	NA	NA
Chromium VI(C)	NA	NA	NA	NA
Manganese (NC)	1.00E-01 (3)	1.00E-01 (2)	NA	NA
Nickel (NC)	2.00E-02 (3)	2.00E-02 (2)	NA	NA
Vanadium(NC)	7.00E-03 (2)	7.00E-03 (2)	NA	NA
Zinc (NC)	2.00E-01 (2)	2.00E-01 (2)	NA	D

(C) - Carcinogen
(NC) - Noncarcinogen

NA - Not Analyzed, Not Applicable, or Not Available
* Reference Dose/Reference Concentration
** RfDs = subchronic reference dose used for exposure periods less than seven years.
*** Oral Carcinogenic Slope Factor
(1) Value derived from a unit risk of 5.0E-05 ug/L proposed in HEAST FY1991.
(2) Values obtained from HEAST FY1991.
(3) Values obtained from IRIS on April 17, 1992.
(4) Derived from 34 mg/l for organoleptic threshold in HEAST FY1991.
A - Sufficient evidence of human carcinogenicity.
B2 - Sufficient evidence of carcinogenicit/ in animals with inadequate evidence in humans.
D - Not classifiable as to human carcinogenicity (inadequate or no evidence).

Table 13
Summary of Site Cancer Risks and Noncancer Health Effects

Noncarcinogenic	Adult	Children
Ground-water Ingestion	8.30E-01	1.29E+00*
Surface Water		
Fish Ingestion	1.08E-02	2.42E-02
Incidental Ingestion	3.91E-05	6.13E-04
Dermal Absorption	1.19E-05	9.52E-05
Total:	8.41E-01	1.31E+00*

Carcinogenic		
Ground-water Ingestion	5.90E-05	2.20E-05
Surface Water		
Fish Ingestion	1.82E-06	1.70E-06
Incidental Ingestion	5.73E-09	3.21E-08
Dermal Absorption	1.75E-09	4.99E-09
Total:	6.08E-05	2.37E-05

*Above the threshold level of one

STATE OF NEW YORK - DEPARTMENT OF HEALTH

INTEROFFICE MEMORANDUM

TO: Joseph Crua
Bureau of Environmental Exposure Investigation

FROM: Donald H. Brown
Bureau of Toxic Substance Assessment

SUBJECT: Metals in Clams from Fish Cove

DATE: September 1, 1992

I have reviewed the data on metals in nine composites of Mercenaria mercenaria collected from Fish Cove; these data are summarized in Table 1.

I compared the results to NYS DEC data on metals in M. mercenaria collected from New York waters during 1982 to 1991. Although some of these data are from clams collected from areas closed to recreational, as well as commercial clamming, they appear to be fairly representative of typical levels of metals from New York waters. The mean level for six of the eight metals in Fish Cove clams is at or below the mean level in the DEC database. The mean cadmium level in clams from Fish Cove is about 40% higher and the mean arsenic level is roughly twice as high. In general, however, results are within range of the DEC data. An assessment of the risks to consumers posed by heavy metals in bivalves from New York's marine waters does not indicate that these levels would be expected to generate doses above levels of concern for clam consumers. This is based on a dose calculated for a 70 Kg individual consuming 20 g clams per day (approximately 1/2 dozen per week) and comparing that dose to a risk reference dose (RfD) reported in the literature (ATSDR, 1988-1991; DOH, 1988). The ratio of dose to RfD (hazard index) is well below 1 for the six elements for which an RfD can be used; these are shown in Table 2.

This approach cannot be used for lead since no RfD exists for lead and no discernable threshold has been observed for health effects of lead ingestion (ATSDR, 1988). The common unit of body burden measurement is blood-lead (PbB), expressed as micrograms per deciliter (ug/dL). The mean PbB level for adults in the United States is estimated to be between 10 8 and 17.7 ug/dL (US EPA, 1989). A means of predicting an increase in PbB due to dietary intake for adults is provided in the following equation (US EPA, 1989):

$$\Delta \text{ PbB} = (0.032 \text{ day/dL}) * (\text{ug/day dietary intake}) \qquad (1)$$

Clinical data have shown this relationship to be valid for daily intakes of less than 200 ug lead. Using a mean of 0.11 ug/g (Table 1), a daily intake is determined as follows: 0.11 ug/g * 20 g/day = 2.2 ug/day. Using this in Equation (1) gives an estimated increase in PbB:

$$\Delta \text{ PbB} = ((0.032 \text{ day/dL}) * 2.2 \text{ ug/day}) = 0.07 \text{ ug/dL}$$

This indicates that consumption of M. mercenaria from these waters is not expected to significantly increase an individual's blood-lead level.

The oral reference dose for arsenic is for inorganic arsenic. Research has shown that the chemical forms of arsenic found in clams and other marine life are unusual and complex organic molecules (ATSDR, 1992; US EPA, 1984). These organic arsenicals are considered relatively nontoxic and are substantially less toxic than the inorganic forms of arsenic that have

caused toxic effects in humans and animals. They are mainly derivatives of arsenobetaine and arsenocholine and are extensively absorbed, but are resistent to metabolism and are rapidly excreted intact. Therefore, its toxicity is greatly reduced compared to inorganic arsenic (Foa et al., 1984; ATSDR, 1987). Consequently, the risks of ingesting arsenic in M. mercenaria are not considered to be substantial.

In conclusion, clam samples from Fish Cove contain levels of metals generally within range of those collected from other waters and do not appear to present any significant increased health risk to consumers.

References

Agency for Toxic Substances and Disease Registry (ATSDR). Toxicological Profile for Arsenic 1991; Cadmium, 1989; Lead, 1988; Mercury, 1988; Copper, 1990; Chromium, 1989; Nickel, 1988; Zinc, 1989. Oak Ridge National Laboratory, Oak Ridge, TN.

NYS DOH, 1988. Ambient Water Quality Human Health Fact Sheets on Mercury. BTSA, NYS DOH, Albany, New York.

Foa, V., A. Columbi, M. Maroni, M. Buratti and G. Calzaferri. 1984. Speciation of the Chemical Forms of Arsenic in the Biological Monitoring of Exposure to Inorganic Arsenic. Science Total Environ., 34: 241-259.

U.S. Environmental Protection Agency (US EPA). 1989. Review of the National Ambient Air Quality Standards for Lead: Exposure Analysis Methodology and Validation. EPA-450/2-89=011.

U.S. Environmental Protection Agency (US EPA). 1984. Health Assessment Document for Inorganic Arsenic. EPA-600/8-83-021F. Washington, D.C.: Office of Health and Environmental Assessment.

djv/22370231

Attachment

cc: Dr. Horn
Mr. Chinery

Table 1
Metals in Clams, North Sea Landfill

Sample ID	Pb	Cd	As	Hg	Cr	Cu	Ni	Zn
9096	0.1*	0.14	1.38	0.006	0.2*	1.36	0.2*	9.24
9097	0.1*	0.18	1.22	0.011	0.2*	1.52	0.2*	8.14
9098	0.1*	0.22	2.18	0.021	0.2*	2.10	0.4	8.38
9099	0.1*	0.26	2.90	0.054	0.2*	3.60	0.56	9.20
9100	0.1*	0.28	0.74	0.086	0.2*	4.06	0.2*	13.3
9101	0.1*	0.32	2.22	0.026	0.2*	2.24	0.4	9.60
9102	0.15*	0.55	1.85	0.021	0.25*	2.02	0.53	10.1
9103	0.1*	0.42	2.04	0.038	0.2*	2.16	0.56	8.06
9104	0.15*	0.25	2.03	0.018	0.5*	2.03	0.5*	8.20
mean	0.11	0.29	1.84	0.03	0.24	2.34	0.40	9.36
DEC Database								
Mean	0.363	0.207	0.942	0.037	0.383	2.41	0.878	18.2
n	126	116	63	67	116	63	61	50
min	0.08	0.08	0.04	0.01	0.01	1.33	0.50	12.1
max	1.04	0.37	2.17	0.173	1.05	3.76	1.77	32.8

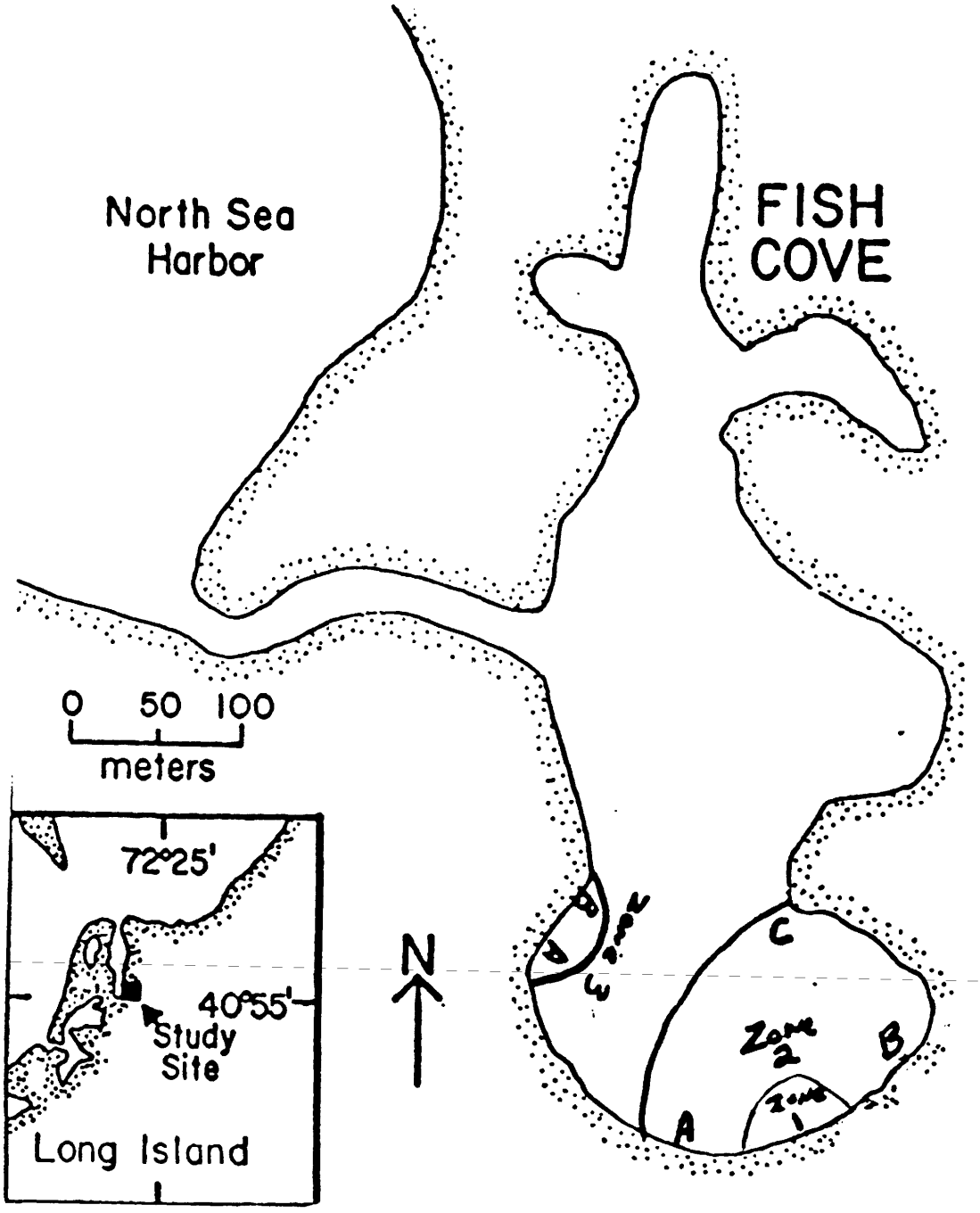
* - 1/2 detection limit

Table 2
Comparison of Dose to RfD

Element	Mean (ppm)	Dose (mg/Kg/day)	Oral RfD	Hazard Index
Cadmium	0.29	8.29E-5	6.9E-4	0.12
Chromium III	0.24	6.86E-5	1.0	<0.01
Mercury (organic)	0.03	8.57E-6	9.0E-5	0.10
Copper	2.34	6.69E-4	3.7E-2*	0.02
Nickel	0.40	1.14E-4	2.0E-2	<0.01
Zinc	9.36	2.67E-3	2.0E-1	0.01

Dose is calculated for a 70 Kg individual consuming 20 g clams per day

* - surrogate RfD calculated from 1.3 mg/L drinking water standard



Zone	No. of Clams Analyzed	Range of the Size of Clams in Millimeters	Sample Number
1*	-	-	-
2A-1	5	70 - 85	9096
2A-2	5	52.5 - 57.5	9097
2B	2	65 and 70	9098
2C-1	5	72.5 - 90	9099
2C-2	5	52.5 - 65	9100
3A-1	5	52.5 - 60	9101
3A-2	5	45 - 47.5	9102
3B-1	5	55 - 67.5	9103
3B-2	5	45 - 50	9104

*No Clams Found in Zone 1

APPENDIX III

Document Number: NOR-001-0001 To 0002 Date: 12/21/89

Title: (Letter discussing the work that needs to be done prior to the submission of the Operable Unit II Remedial Investigation Report)

Type: CORRESPONDENCE
Author: Petersen, Carole: US EPA
Recipient: DiPirro, Mardythe: Town of Southampton

Document Number: NOR-001-0003 To 0052 Date: 01/08/90

Title: Air Cleanup Criteria

Type: PLAN
Condition: MARGINALIA
Author: none: NY Dept of Environmental Conservation
Recipient: none: none

Document Number: NOR-001-0053 To 0053 Date: 02/02/90

Title: (Memo forwarding the enclosed Fish Cove Study Report for the North Sea Municipal Landfill site for review and comment)

Type: CORRESPONDENCE
Condition: MISSING ATTACHMENT
Author: Petersen, Carole: US EPA
Recipient: Malleck, John: US EPA

Document Number: NOR-001-0054 To 0055 Date: 01/16/91

Title: (Letter regarding items which EPA considers necessary to be addressed prior to the submission of the North Sea Landfill Operable Unit II Remedial Investigation/Feasibility Study)

Type: CORRESPONDENCE
Author: Grosser, Paul W.: H2M Group (Holzmacher McLendon & Murrell)
Recipient: Peterson, Carole: US EPA

Document Number: NOR-001-0056 To 0056 Date: 08/01/89

Title: Status of All North Sea Landfill Wells

Type: DATA
Author: none: H2M Group (Holzmacher McLendon & Murrell)
Recipient: none: none
Attached: NOR-001-0057

Document Number: NOR-001-0057 To 0067 Parent: NOR-001-0056 Date: 05/11/89

Title: Procedure Clarification Statement #1 (Loss of volatiles due to pressure gradients caused by bladder pumps)

Type: CORRESPONDENCE
Author: none: NJ Department of Environmental Protection (NJDEP)
Recipient: none: none

Document Number: NOR-001-0068 To 0163 Date: 02/01/90

Title: North Sea Landfill Phase II Remedial Investigation, Fish Cove Study, Town of Southampton, Suffolk County, New York

Type: REPORT
Condition: DRAFT
Author: none: H2M Group (Holzmacher McLendon & Murrell)
Recipient: none: US EPA

Document Number: NOR-001-0164 To 0166 Date: 02/06/90

Title: (Letter forwarding the enclosed validated laboratory data for the North Sea Landfill site)

Type: CORRESPONDENCE
Author: Vilardi, Christine: H2M Group (Holzmacher McLendon & Murrell)
Recipient: Kwan, Caroline: US EPA
Attached: NOR-001-0167

Document Number: NOR-001-0167 To 0292 Parent: NOR-001-0164 Date: / /

Title: Statement of Qualifications for Laboratory Data Validation (and standard operating procedures for methods to be used in data validation)

Type: PLAN
Author: various: H2M Group (Holzmacher McLendon & Murrell)
Recipient: none: US EPA

Document Number: NOR-001-0293 To 0294 Date: 02/22/90

Title: (Letter forwarding the enclosed Draft Letter Report entitled, "Evaluation of Need for Upgradient and Two Downgradient Wells, North Sea Landfill, Southampton, New York")

Type: CORRESPONDENCE
Author: Graber, Scott B.: CDM Federal Programs Corporation
Recipient: Moyik, Cathy: US EPA
Attached: NOR-001-0295

Document Number: NOR-001-0295 To 0296 Parent: NOR-001-0293 Date: 02/14/90

Title: Draft Letter Report, Evaluation of Need for Upgradient and Two Downgradient Wells, North Sea Landfill, Southampton, New York

Type: REPORT
Condition: DRAFT
Author: Johns, Keith B.: Versar
Recipient: Kwan, Caroline: US EPA

Document Number: NOR-001-0297 To 0297 Date: 03/05/90

Title: (Letter forwarding the enclosed copies of the Phase II Remedial Investigation Work/Quality Assurance Plan Short Form for the North Sea Municipal Landfill site)

Type: CORRESPONDENCE
Author: Vilardi, Christine: H2M Group (Holzmacher McLendon & Murrell)
Recipient: Kwan, Caroline: US EPA
Attached: NOR-001-0298

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Document Number: NOR-001-0298 To 0308 Parent: NOR-001-0297 Date: 03/01/90

Title: Town of Southampton, Suffolk County, New York, Field Operations Plan, North Sea Landfill, Phase III, Work/Quality Assurance Plan Short Form

Type: PLAN
Author: none: H2M Group (Holzmacher McLendon & Murrell)
Recipient: none: US EPA

Document Number: NOR-001-0309 To 0309 Date: 03/08/90

Title: (Memo forwarding the enclosed North Sea Municipal Landfill Operable Unit II Field Operation Plan)

Type: CORRESPONDENCE
Condition: MISSING ATTACHMENT
Author: Hauptman, Melvin: US EPA
Recipient: Bevilaqua, Lou: US EPA

Document Number: NOR-001-0310 To 0310 Date: 03/16/90

Title: (Letter forwarding the enclosed Letter Report entitled "Technical Evaluation of the Phase II Remedial Investigation at Fish Cove for North Sea Landfill, North Sea Landfill, Southampton, New York")

Type: CORRESPONDENCE
Author: Graber, Scott B.: CDM Federal Programs Corporation
Recipient: Moyik, Cathy: US EPA
Attached: NOR-001-0311

Document Number: NOR-001-0311 To 0316 Parent: NOR-001-0310 Date: / /

Title: Letter Report, Technical Evaluation of the Phase II Remedial Investigation at Fish Cove For North Sea Landfill, North Sea Landfill, Southampton, New York

Type: REPORT
Author: none: CDM Federal Programs Corporation
Recipient: none: US EPA

Document Number: NOR-001-0317 To 0317 Date: 03/21/90

Title: (Letter forwarding the enclosed performance evaluation information for H2M Labs relevant to their Phase III application)

Type: CORRESPONDENCE
Author: Vilardi, Christine L.: H2M Group (Holzmacher McLendon & Murrell)
Recipient: Scalise, Laura: US EPA

Document Number: NOR-001-0318 To 0318 Date: 03/27/90

Title: (Memo discussing the spot checking and the confirmation of the responsible parties' data validation of the raw data package for the North Sea Municipal Landfill Fish Cove Study)

Type: CORRESPONDENCE
Condition: MISSING ATTACHMENT
Author: Hauptman, Melvin: US EPA
Recipient: Bevilaqua, Lou: US EPA

Document Number: NOR-001-0319 To 0320 Date: 03/28/90

Title: (Letter commenting on the Fish Cove Study for the North Sea Municipal Landfill site)

Type: CORRESPONDENCE
Author: Greco, Jonathan: NY Dept of Environmental Conservation
Recipient: Kwan, Caroline: US EPA

Document Number: NOR-001-0321 To 0323 Date: 04/04/90

Title: (Memo commenting on the work/quality assurance short form for the March 1990 North Sea Municipal Landfill Phase III Remedial Investigation)

Type: CORRESPONDENCE
Author: Scalise, Laura: US EPA
Recipient: Kwan, Caroline: US EPA

Document Number: NOR-001-0324 To 0324 Date: 04/05/90

Title: (Memo discussing the evaluation of the March 1990 Field Operations Plan for the North Sea Municipal Landfill site)

Type: CORRESPONDENCE
Author: Hillis, Pamela: Versar
Recipient: Kwan, Caroline: US EPA

Document Number: NOR-001-0325 To 0325 Date: 04/05/90

Title: (Memo regarding the North Sea Municipal Landfill Remedial Investigation Study of Fish Cove and comments by John Malleck)

Type: CORRESPONDENCE
Author: Hillis, Pamela: Versar
Recipient: Kwan, Caroline: US EPA

Document Number: NOR-001-0326 To 0327 Date: 04/18/90

Title: (Letter commenting on the Phase III Remedial Investigation/Feasibility Study Work Plan for the North Sea Municipal Landfill site, Operable Unit II)

Type: CORRESPONDENCE
Author: Greco, Jonathan: NY Dept of Environmental Conservation
Recipient: Kwan, Caroline: US EPA

Document Number: NOR-001-0328 To 0331 Date: 04/19/90

Title: (Memo expressing concern that the North Sea Municipal Landfill Remedial Investigation Study of Fish Cove made statements that were not fully supported, and that its main objectives were not met)

Type: CORRESPONDENCE
Author: Frithsen, Jeffrey B.: Versar
Recipient: Hillis, Pamela: Versar

Document Number: NOR-001-0332 To 0332 Date: 05/30/90

Title: (Letter forwarding the enclosed comments on the North Sea Municipal Landfill, Operable Unit II/Phase II Remedial Investigation, Work/Quality Assurance Plan)

Type: CORRESPONDENCE
Author: Petersen, Carole: US EPA
Recipient: Stavropoulos, George: Town of Southampton
Attached: NOR-001-0333

Document Number: NOR-001-0333 To 0336 Parent: NOR-001-0332 Date: 05/30/90

Title: (Comments on the North Sea Municipal Landfill, Operable Unit II/Phase II Remedial Investigation, Work/Quality Assurance Plan)

Type: CORRESPONDENCE
Author: none: US EPA
Recipient: none: Town of Southampton

Document Number: NOR-001-0337 To 0341 Date: 06/06/90

Title: (Letter commenting on the Draft North Sea Municipal Landfill Phase II Remedial Investigation Fish Cove Study)

Type: CORRESPONDENCE
Author: Csulak, Frank: National Oceanic & Atmospheric Administration (NOAA)
Recipient: Kwan, Caroline: US EPA

Document Number: NOR-001-0342 To 0342 Date: 04/03/90

Title: Request for Data Validation of PRP Cases

Type: OTHER
Author: Scalise, Laura: US EPA
Recipient: none: H2M Group (Holzmacher McLendon & Murrell)
Attached: NOR-001-0343

Document Number: NOR-001-0343 To 0344 Parent: NOR-001-0342 Date: 06/07/90

Title: (Memo commenting on missing and incorrect parameters in the data package)

Type: CORRESPONDENCE
Author: Mehta, Gayatri: Weston Environmental Consultants Designers
Recipient: Scalise, Laura: US EPA

Document Number: NOR-001-0345 To 0345 Date: 04/03/90

Title: Request for Data Validation of PRP Cases

Type: OTHER
Author: Scalise, Laura: US EPA
Recipient: none: H2M Group (Holzmacher McLendon & Murrell)
Attached: NOR-001-0346

Document Number: NOR-001-0346 To 0347 Parent: NOR-001-0345 Date: 06/18/90

Title: (Memo discussing the evaluation of the analytical data package for the North Sea Landfill Phase II)

Type: CORRESPONDENCE
Author: Puckace, Marybeth: Weston Environmental Consultants Designers
Recipient: Scalise, Laura: US EPA

Document Number: NOR-001-0348 To 0348 Date: 06/26/90

Title: (Memo reviewing the New York State Department of Environmental Conservation's comments on the North Sea Landfill Endangerment Assessment Addendum)

Type: CORRESPONDENCE
Author: DiGuiseppi, Bill: US EPA
Recipient: Hillis, Pamela: US EPA

Document Number: NOR-001-0349 To 0349 Date: 07/03/90

Title: (Letter requesting comments on the North Sea Municipal Landfill Operable Unit II/Phase II Remedial Investigation, Work/Quality Assurance Plan)

Type: CORRESPONDENCE
Author: Petersen, Carole: US EPA
Recipient: Stavropculos, George: Town of Southampton

Document Number: NOR-001-0350 To 0350 Date: 07/18/90

Title: (Letter confirming a July 26, 1990, meeting to discuss groundwater monitoring for the North Sea Municipal Landfill site)

Type: CORRESPONDENCE
Author: Grosser, Paul W.: H2M Group (Holzmacher McLendon & Murrell)
Recipient: Kwan, Caroline: US EPA

Document Number: NOR-001-0351 To 0352 Date: 08/03/90

Title: (Memo stating that contaminants found in Fish Cove cannot be definitively linked to leachate from the North Sea Municipal Landfill according to the Phase II Remedial Investigation)

Type: CORRESPONDENCE
Author: Frithsen, Jeffrey B.: Versar
Recipient: Hillis, Pamela: US EPA

Document Number: NOR-001-0353 To 0365 Date: 08/07/90

Title: (Letter forwarding H2M's response to EPA's comments on the North Sea Municipal Landfill, Operable Unit II/Phase II Remedial Investigation, Work/Quality Assurance Plan)

Type: CORRESPONDENCE
Author: Grosser, Paul W.: H2M Group (Holzmacher McLendon & Murrell)
Recipient: Kwan, Caroline: US EPA

Document Number: NOR-001-0366 To 0367 Date: 08/08/90

Title: (Letter responding to EPA's comments on the North Sea Municipal Landfill Operable Unit II/Phase II Remedial Investigation, Work/Quality Assurance Plan)

Type: CORRESPONDENCE
Author: Grosser, Paul W.: H2M Group (Holzmacher McLendon & Murrell)
Recipient: Kwan, Caroline: US EPA

Document Number: NOR-001-0368 To 0369 Date: 09/04/90

Title: (Memo stating that H2M's response to EPA's comments on the North Sea Municipal Landfill Remedial Investigation Phase III Revised Work/QA Plan Short Form were not sufficient)

Type: CORRESPONDENCE
Author: Scalise, Laura: US EPA
Recipient: Kwan, Caroline: US EPA

Document Number: NOR-001-0370 To 0371 Date: / /

Title: (Memo detailing a modification to the New York State Department of Environmental Conservation's Application for Federal Assistance for the North Sea Municipal Landfill site)

Type: CORRESPONDENCE
Author: Petersen, Carole: US EPA
Recipient: Beggun, Helen: US EPA

Document Number: NOR-001-0372 To 0373 Date: 10/03/90

Title: (Letter forwarding comments on the North Sea Municipal Landfill, Operable Unit II/Phase II Remedial Investigation, Work/Quality Assurance Plan and conditionally approving the plan based on incorporation of EPA's comments)

Type: CORRESPONDENCE
Author: Petersen, Carole: US EPA
Recipient: Stavropoulos, George: Town of Southampton

Document Number: NOR-001-0374 To 0374 Date: 10/03/90

Title: (Memo updating recent correspondence and planned actions between New York State Department of Environmental Conservation and the Suffolk Health Department regarding well sampling)

Type: CORRESPONDENCE
Author: Block, Arthur: Agency for Toxic Substances & Disease Registry (ATSDR)
Recipient: Kwan, Caroline: US EPA

Document Number: NOR-001-0375 To 0375 Date: 11/01/90

Title: (Letter requesting written monthly progress reports for the North Sea Municipal Landfill site)

Type: CORRESPONDENCE
Author: Kwan, Carline: US EPA
Recipient: Stavropoulos, George: Town of Southampton

Document Number: NOR-001-0376 To 0376 Date: 11/07/90

Title: (Letter forwarding the October Monthly Status Report for the North Sea Landfill site)

Type: CORRESPONDENCE
Author: Grosser, Paul W.: H2M Group (Holzmacher McLendon & Murrell)
Recipient: Kwan, Caroline: US EPA
Attached: NOR-001-0377

Document Number: NOR-001-0377 To 0382 Parent: NOR-001-0376 Date: 11/06/90

Title: Progress Report (for the North Sea Municipal Landfill site)

Type: REPORT
Author: Bianchetti, Susan: H2M Group (Holzmacher McLendon & Murrell)
Recipient: Kwan, Caroline: US EPA

Document Number: NOR-001-0383 To 0383 Date: 11/19/90

Title: (Letter responding to EPA's second set of comments on the North Sea Municipal Landfill, Operable Unit II/Phase II Remedial Investigation, Work/Quality Assurance Plan)

Type: CORRESPONDENCE
Author: Grosser, Paul W.: H2M Group (Holzmacher McLendon & Murrell)
Recipient: Kwan, Caroline: US EPA
Attached: NOR-001-0384

Document Number: NOR-001-0384 To 0389 Parent: NOR-001-0383 Date: / /

Title: Environmental Protection Agency Comments, Operable Unit II - Remedial Investigation Work/Quality Assurance Plan (H2M's responses to comments received from EPA)

Type: PLAN
Author: none: H2M Group (Holzmacher McLendon & Murrell)
Recipient: none: US EPA

Document Number: NOR-001-0390 To 0390 Date: / /

Title: (Letter requesting the submittal of the November and December Monthly Progress Reports on the Remedial Investgation/Feasibility Study for the North Sea Municipal Landfill site, Operable Unit II)

Type: CORRESPONDENCE
Author: Kwan, Caroline: US EPA
Recipient: Gilbride, Brian: Town of Southampton

Document Number: NOR-001-0391 To 0393 Date: 01/02/91

Title: (Memo containing comments from the Region II EPA Biological Technical Assistant Group on the Draft Remedial Investigation, Phase II for the North Sea Municipal Landfill site)

Type: CORRESPONDENCE
Condition: MARGINALIA
Author: Stevens, Shari: US EPA
Recipient: Kwan, Caroline: US EPA
Attached: NOR-001-0394

Document Number: NOR-001-0394 To 0395 Parent: NOR-001-0391 Date: 04/01/89

Title: Ambient Water Quality Criteria for Ammonia, (Saltwater) - 1989

Type: DATA
Author: none: US EPA
Recipient: none: none

Document Number: NOR-001-0396 To 0396 Date: 01/02/91

Title: (Letter forwarding the enclosed November Monthly Status Report for the North Sea Municipal Landfill site)

Type: CORRESPONDENCE
Author: Haimson, Jill S.: H2M Group (Holzmacher McLendon & Murrell)
Recipient: Hess, Alison: US EPA
Attached: NOR-001-0397 NOR-001-0398

Document Number: NOR-001-0397 To 0397 Parent: NOR-001-0396 Date: 12/18/90

Title: Letter of Transmittal (transmitting the November Monthly Progress Report for the North Sea Municipal Landfill site)

Type: CORRESPONDENCE
Author: Bianchetti, Susan: H2M Group (Holzmacher McLendon & Murrell)
Recipient: Hess, Alison: US EPA

Document Number: NOR-001-0398 To 0403 Parent: NOR-001-0396 Date: 12/02/90

Title: Progress Report (November 1990, for the North Sea Municipal Landfill site)

Type: REPORT
Author: Bianchetti, Susan: H2M Group (Holzmacher McLendon & Murrell)
Recipient: none: US EPA

Document Number: NOR-001-0404 To 0404 Date: 02/14/91

Title: (Letter forwarding the December and January Status Reports for the North Sea Municipal Landfill site)

Type: CORRESPONDENCE
Author: Haimson, Jill S.: H2M Group (Holzmacher McLendon & Murrell)
Recipient: Hess, Alison: US EPA
Attached: NOR-001-0405

Document Number: NOR-001-0405 To 0406 Parent: NOR-001-0404 Date: 01/21/91

Title: Progress Report (December 1990 - January 1991 for the North Sea Municipal Landfill site)

Type: REPORT
Author: Bianchetti, Susan F.: H2M Group (Holzmacher McLendon & Murrell)
Recipient: none: US EPA

Document Number: NOR-001-0407 To 0407 Date: 03/04/91

Title: (Letter forwarding the enclosed executed amendment to Administrative Order on Consent, Index Number II CERCLA 70202)

Type: CORRESPONDENCE
Author: Doyle, James: US EPA
Recipient: Kravit, Craig B.: Beveridge & Diamond

Document Number: NOR-001-0408 To 0409 Date: 02/27/91

Title: Amendment to Administrative Order (on Consent) In the Matter of Town of Southampton, N.Y. (North Sea Municipal Landfill) Index No. II-CERCLA-70202

Type: LEGAL DOCUMENT
Author: Sidamon-Eristoff, C.: US EPA
Recipient: Stavropoulos, George: Town of Southampton

Document Number: NOR-001-0410 To 0410 Date: 03/13/91

Title: Letter of Transmittal (for December and January Monthly Progress Report for the North Sea Municipal Landfill site)

Type: CORRESPONDENCE
Condition: MISSING ATTACHMENT
Author: Bianchetti, Susan: H2M Group (Holzmacher McLendon & Murrell)
Recipient: Kwan, Caroline: US EPA

Document Number: NOR-001-0411 To 0411 Date: 04/05/91

Title: (Letter forwarding the enclosed February and March 1991, Monthly Status Report for the North Sea Municipal Landfill site)

Type: CORRESPONDENCE
Author: Haimson, Jill S.: H2M Group (Holzmacher McLendon & Murrell)
Recipient: Kwan, Caroline: US EPA
Attached: NOR-001-0412

Document Number: NOR-001-0412 To 0413 Parent: NOR-001-0411 Date: 04/04/91

Title: Progress Report (for February and March 1991, at the North Sea Municipal Landfill site)

Type: REPORT
Author: Bianchetti, Susan: H2M Group (Holzmacher McLendon & Murrell)
Recipient: none: US EPA

Document Number: NOR-001-0414 To 0414 Date: 05/03/91

Title: (Letter stating that the Southampton Town Board awarded Soil Mechanics the contract to install two monitoring wells in connection with Phase II of the the North Sea Municipal Landfill site, Operable Unit II Remedial Investigation)

Type: CORRESPONDENCE
Author: Thommen, Kenneth H.: Town of Southampton
Recipient: none: Soil Mechanics

Document Number: NOR-001-0415 To 0415 Date: 05/10/91

Title: (Letter forwarding the April 1991, Monthly Status Report for the North Sea Municipal Landfill site)

Type: CORRESPONDENCE
Author: Haimson, Jill S.: H2M Group (Holzmacher McLendon & Murrell)
Recipient: Kwan, Caroline: US EPA
Attached: NOR-001-0416

Document Number: NOR-001-0416 To 0417 Parent: NOR-001-0415 Date: 05/08/91

Title: Progress Report (April 1991, for the North Sea Municipal Landfill site)

Type: REPORT
Author: Bianchetti, Susan F.: H2M Group (Holzmacher McLendon & Murrell)
Recipient: none: US EPA

Document Number: NOR-001-0418 To 0418 Date: 06/27/91

Title: (Memo detailing groundwater sampling protocols for the North Sea Municipal Landfill site)

Type: CORRESPONDENCE
Author: Haimson, Jill S.: H2M Group (Holzmacher McLendon & Murrell)
Recipient: file: H2M Group (Holzmacher McLendon & Murrell)

Document Number: NOR-001-0419 To 0419 Date: 07/03/91

Title: (Letter forwarding the enclosed residential well surveys for the private wells in the vicinity of the North Sea Municipal Landfill site)

Type: CORRESPONDENCE
Author: Petersen, Carole: US EPA
Recipient: Stavropoulos, George: Town of Southampton

Document Number: NOR-001-0420 To 0424 Date: 07/08/91

Title: Progress Report (May 1991 for the North Sea Municipal Landfill site)

Type: REPORT
Author: Bianchetti, Susan F.: H2M Group (Holzmacher McLendon & Murrell)
Recipient: none: US EPA

Document Number: NOR-001-0425 To 0426 Date: 07/22/91

Title: (Letter detailing tasks to be performed by the Town of Southampton and discussing the sampling requirements by EPA and the NYSDEC for the two newly installed monitoring wells at the North Sea Municipal Landfill site)

Type: CORRESPONDENCE
Author: Petersen, Carole: US EPA
Recipient: Stavropoulos, George: Town of Southampton

Document Number: NOR-001-0427 To 0427 Date: 07/26/91

Title: (Letter forwarding the enclosed Community Relations Plan for the North Sea Municipal Landfill site)

Type: CORRESPONDENCE
Author: Kwan, Caroline: US EPA
Recipient: Stavropoulos, George: Town of Southampton

Document Number: NOR-001-0428 To 0428 Date: 07/30/91

Title: (Letter forwarding the June 1991, Monthly Status Report for the North Sea Municipal Landfill site)

Type: CORRESPONDENCE
Author: Haimson, Jill S.: H2M Group (Holzmacher McLendon & Murrell)
Recipient: Kwan, Caroline: US EPA
Attached: NOR-001-0429

Document Number: NOR-001-0429 To 0443 Parent: NOR-001-0428 Date: 07/30/91

Title: Progress Report (June 1991, for the North Sea Municipal Landfill site)

Type: REPORT
Author: Bianchetti, Susan F.: H2M Group (Holzmacher McLendon & Murrell)
Recipient: none: US EPA

Document Number: NOR-001-0444 To 0445 Date: 08/20/91

Title: Progress Report (July 1991, for the North Sea Municipal Landfill site)

Type: REPORT
Author: Bianchetti, Susan F.: H2M Group (Holzmacher McLendon & Murrell)
Recipient: none: US EPA

Document Number: NOR-001-0446 To 0446 Date: 10/07/91

Title: (Letter forwarding the enclosed September 1991, Monthly Status Report for the North Sea Municipal Landfill site)

Type: CORRESPONDENCE
Author: Haimson, Jill S.: H2M Group (Holzmacher McLendon & Murrell)
Recipient: Kwan, Caroline: US EPA
Attached: NOR-001-0447

Document Number: NOR-001-0447 To 0451 Parent: NOR-001-0446 Date: 10/07/91

Title: Progress Report (September 1991, for the North Sea Municipal Landfill site)

Type: REPORT
Author: Bianchetti, Susan F.: H2M Group (Holzmacher McLendon & Murrell)
Recipient: none: US EPA

Document Number: NOR-001-0452 To 0452 Date: 10/17/91

Title: (Letter requesting that the status of the ground water sampling results be included in the June 1991, Monthly Progress Report for the North Sea Municipal Landfill site)

Type: CORRESPONDENCE
Author: Kwan, Caroline: US EPA
Recipient: Haimson, Jill S.: H2M Group (Holzmacher McLendon & Murrell)

Document Number: NOR-001-0453 To 0453 Date: 10/22/91

Title: (Letter forwarding the enclosed revised September 1991, Monthly Status Report for the North Sea Municipal Landfill site)

Type: CORRESPONDENCE
Author: Haimson, Jill S.: H2M Group (Holzmacher McLendon & Murrell)
Recipient: Kwan, Caroline: US EPA
Attached: NOR-001-0454

Document Number: NOR-001-0454 To 0458 Parent: NOR-001-0453 Date: 10/22/91

Title: Revised Progress Report (September 1991, for the North Sea Municipal Landfill site)

Type: REPORT
Author: Bianchetti, Susan F.: H2M Group (Holzmacher McLendon & Murrell)
Recipient: none: US EPA

Document Number: NOR-001-0459 To 0459 Date: 11/18/91

Title: (Memo requesting that a copy of the February 1990, North Sea Municipal Landfill Fish Cove Study be submitted to Biological Technical Assistance Group for review and comment)

Type: CORRESPONDENCE
Condition: MISSING ATTACHMENT
Author: Kwan, Caroline: US EPA
Recipient: Steven, Shari: US EPA

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Document Number: NOR-001-0460 To 0460 Date: 12/16/91

Title: (Letter forwarding the enclosed October and November Monthly Status Reports for the North Sea Municipal Landfill site)

Type: CORRESPONDENCE
Condition: MISSING ATTACHMENT
Author: Haimson, Jill S.: H2M Group (Holzmacher McLendon & Murrell)
Recipient: Kwan, Caroline: US EPA
Attached: NOR-001-0461

Document Number: NOR-001-0461 To 0462 Parent: NOR-001-0460 Date: 11/26/91

Title: Progress Report (October 1991, for the North Sea Municipal Landfill site)

Type: REPORT
Author: Bianchetti, Susan F.: H2M Group (Holzmacher McLendon & Murrell)
Recipient: none: US EPA

Document Number: NOR-001-0463 To 0463 Date: 01/02/92

Title: (Letter forwarding the enclosed December 1991, Monthly Progress Report for the North Sea Municipal Landfill site)

Type: CORRESPONDENCE
Author: Haimson, Jill S.: H2M Group (Holzmacher McLendon & Murrell)
Recipient: Kwan, Caroline: US EPA
Attached: NOR-001-0464

Document Number: NOR-001-0464 To 0466 Parent: NOR-001-0463 Date: 01/02/92

Title: Progress Report (December 1991, for the North Sea Municipal Landfill site)

Type: REPORT
Author: Bianchetti, Susan F.: H2M Group (Holzmacher McLendon & Murrell)
Recipient: none: US EPA

Document Number: NOR-001-0467 To 0467 Date: 02/05/92

Title: (Letter forwarding the enclosed January 1992, Monthly Status Report for the North Sea Municipal Landfill site)

Type: CORRESPONDENCE
Author: Bianchetti, Susan F.: H2M Group (Holzmacher McLendon & Murrell)
Recipient: Kwan, Caroline: US EPA
Attached: NOR-001-0468

Document Number: NOR-001-0468 To 0469 Parent: NOR-001-0467 Date: 02/05/92

Title: Progress Report (January 1992, for the North Sea Municipal Landfill site)

Type: REPORT
Author: Bianchetti, Susan F.: H2M Group (Holzmacher McLendon & Murrell)
Recipient: none: US EPA

Document Number: NOR-001-0470 To 0470 Date: 03/05/92

Title: (Letter forwarding the enclosed February 1992, Monthly Progress Report for the North Sea Municipal Landfill site)

Type: CORRESPONDENCE
Author: Bianchetti, Susan F.: H2M Group (Holzmacher McLendon & Murrell)
Recipient: Kwan, Caroline: US EPA
Attached: NOR-001-0471

Document Number: NOR-001-0471 To 0472 Parent: NOR-001-0470 Date: 03/05/92

Title: Progress Report (February 1992, for the North Sea Municipal Landfill site)

Type: REPORT
Author: Bianchetti, Susan F.: H2M Group (Holzmacher McLendon & Murrell)
Recipient: none: US EPA

Document Number: NOR-001-0473 To 0473 Date: 02/07/92

Title: (Memo requesting comments on the attached Draft Remedial Investigation Report for the North Sea Municipal Landfill site)

Type: CORRESPONDENCE
Condition: MISSING ATTACHMENT
Author: Petersen, Carole: US EPA
Recipient: various: US EPA

Document Number: NOR-001-0474 To 0474 Date: 02/20/92

Title: (Memo forwarding the Addendum Risk Assessment for the North Sea Municipal Landfill site, Operable Unit II)

Type: CORRESPONDENCE
Condition: MISSING ATTACHMENT
Author: Hauptman, Melvin: US EPA
Recipient: Santella, Dennis: US EPA

Document Number: NOR-001-0475 To 0475 Date: 03/05/92

Title: (Letter forwarding the results of the residential well survey performed as part of the Remedial Investigation at the North Sea Municipal Landfill site)

Type: CORRESPONDENCE
Author: Bianchetti, Susan F.: H2M Group (Holzmacher McLendon & Murrell)
Recipient: Kwan, Caroline: US EPA
Attached: NOR-001-0476

Document Number: NOR-001-0476 To 0476 Parent: NOR-001-0475 Date: 03/09/92

Title: (Letter discussing the results of drinking water sampling conducted on residential wells in the Town of Southampton, New York)

Type: CORRESPONDENCE
Condition: MISSING ATTACHMENT
Author: Kwan, Caroline: US EPA
Recipient: residents: Town of Southampton

Document Number: NOR-001-0477 To 0477 Date: 03/18/92

Title: (Letter forwarding the enclosed report entitled "Town of Southampton, North Sea Municipal Landfill, Fish Cove Study")

Type: CORRESPONDENCE
Author: Bianchetti, Susan F.: H2M Group (Holzmacher McLendon & Murrell)
Loesch, Gary E.: H2M Group (Holzmacher McLendon & Murrell)
Recipient: various: Town of Southampton
Attached: NOR-001-0478

Document Number: NOR-001-0478 To 0621 Parent: NOR-001-0477 Date: 03/01/92

Title: Town of Southhampton, Suffolk County, New York, North Sea Landfill Fish Cove Study

Type: PLAN
Author: none: H2M Group (Holzmacher McLendon & Murrell)
Recipient: none: US EPA
none: Town of Southampton

Document Number: NOR-001-0622 To 0624 Date: 04/10/92

Title: (Memo responding to Biological Technical Assistance Group's comments on the North Sea Municipal Landfill, Operable Unit II Remedial Investigation Report)

Type: CORRESPONDENCE
Author: Kwan, Caroline: US EPA
Recipient: Stevens, Shari: US EPA

Document Number: NOR-001-0625 To 0628 Date: 04/14/92

Title: (Letter responding to comments on the North Sea Municipal Landfill, Operable Unit II Remedial Investigation Report)

Type: CORRESPONDENCE
Author: Kwan, Caroline: US EPA
Recipient: Csulak, Frank G.: National Oceanic & Atmospheric Administration (NOAA)

Document Number: NOR-001-0629 To 0637 Date: 04/21/92

Title: (Letter in response to comments dated March 20, 1992, on the North Sea Municipal Landfill Remedial Investigation Report)

Type: CORRESPONDENCE
Author: Kwan, Caroline: US EPA
Recipient: Greco, Jonathan: NY Dept of Environmental Conservation
Attached: NOR-001-0638 NOR-001-0639 NOR-001-0641 NOR-001-0642 NOR-001-0643

Document Number: NOR-001-0638 To 0638 Parent: NOR-001-0629 Date: 05/14/90

Title: (Letter forwarding the Summary Report of the Phase II Remedial Investigation Oversight and Split Sample Results for the North Sea Municipal Landfill site)

Type: CORRESPONDENCE
Condition: MISSING ATTACHMENT
Author: Kwan, Caroline: US EPA
Recipient: Greco, Jonathan: NY Dept of Environmental Conservation

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Document Number: NOR-001-0639 To 0640 Parent: NOR-001-0629 Date: 02/20/90

Title: (Letter forwarding the enclosed Record of Decision and other documents needed for the March 8, 1980, meeting to discuss the North Sea Municipal Landfill site)

Type: CORRESPONDENCE
Condition: MISSING ATTACHMENT
Author: Graves, Lorraine S.: NY Dept of State
Recipient: Barton, William: NY Dept of State

Document Number: NOR-001-0641 To 0641 Parent: NOR-001-0629 Date: 04/18/90

Title: (Letter forwarding the enclosed Review of the North Sea Municipal Landfill Endangerment Assessment Addendum)

Type: CORRESPONDENCE
Condition: MISSING ATTACHMENT
Author: Kwan, Caroline: US EPA
Recipient: Greco, Jonathan: NY Dept of Environmental Conservation

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Document Number: NOR-001-0642 To 0642 Parent: NOR-001-0629 Date: 03/08/90

Title: (Letter forwarding the Operable Unit II, Remedial Investigation/Feasibility Study Work/Quality Assurance Plan Short Form)

Type: CORRESPONDENCE
Condition: MISSING ATTACHMENT
Author: Kwan, Caroline: US EPA
Recipient: Greco, Jonathan: NY Dept of Environmental Conservation

Document Number: NOR-001-0643 To 0644 Parent: NOR-001-0629 Date: 12/21/89

Title: (Letter discussing the North Sea Municipal Landfill site, Operable Unit II and listing items to be addressed prior to submittal of the Operable Unit II Remedial Investigation Report)

Type: CORRESPONDENCE
Author: Petersen, Carole: US EPA
Recipient: DiPirro, Mardythe: Town of Southampton

Document Number: NOR-001-0645 To 0645 Date: 07/05/92

Title: (Letter forwarding the attached June 1992, Monthly Progress Report for the North Sea Landfill site Remedial Investigation/Feeasibility Study, Operable Unit II)

Type: CORRESPONDENCE
Author: Bianchetti, Susan F.: H2M Group (Holzmacher McLendon & Murrell)
Recipient: Kwan, Caroline: US EPA
Attached: NOR-001-0646

Document Number: NOR-001-0646 To 0647 Parent: NOR-001-0645 Date: 07/05/92

Title: (June 1992, Progress Report for the North Sea Landfill site, Operable Unit II)

Type: REPORT
Author: Bianchetti, Susan F.: H2M Group (Holzmacher McLendon & Murrell)
Recipient: none: US EPA

Document Number: NOR-001-0648 To 0648 Date: 07/09/92

Title: (Letter forwarding the enclosed "Town of Southampton, North Sea Landfill, Operable Unit 2 Remedial Investigation Report")

Type: CORRESPONDENCE
Author: Bianchetti, Susan F.: H2M Group (Holzmacher McLendon & Murrell)
Loesch, Gary E.: H2M Group (Holzmacher McLendon & Murrell)
Recipient: Thiele, Fred W. Jr.: Town of Southampton
Town Board Members: Town of Southampton
Attached: NOR-001-0649

Document Number: NOR-001-0649 To 0958 Parent: NOR-001-0648 Date: 07/01/92

Title: Town of Southampton, Suffolk County, New York - North Sea Landfill, Operable Unit 2 Remedial Investigation Report

Type: REPORT
Author: none: H2M Group (Holzmacher McLendon & Murrell)
Recipient: none: none

Document Number: NOR-001-0959 To 0959 Date: / /

Title: (Sample analysis data)

Type: DATA
Author: none: none
Recipient: none: none

Document Number: NOR-001-0960 To 0960 Date: 03/01/88

Title: (Procedure for acidification of aqueous volatile organic samples from the Region II CERCLA QA Manual)

Type: OTHER
Condition: INCOMPLETE
Author: none: US EPA
Recipient: none: none

Document Number: NOR-001-0961 To 0974 Date: / /

Title: Maximum Contaminant Levels (MCLs) Promulgated under the Safe Drinking Water Act

Type: FINANCIAL/TECHNICAL
Author: none: none
Recipient: none: none

Document Number: NOR-001-0975 To 0976 Date: 05/22/92

Title: (Letter forwarding the enclosed North Sea Landfill Final Endangerment Assessment Addendum II)

Type: CORRESPONDENCE
Author: Graber, Scott B.: CDM Federal Programs Corporation
Recipient: Moyik, Catherine E.: US EPA
Attached: NOR-001-0977

Document Number: NOR-001-0977 To 1091 Parent: NOR-001-0975 Date: 05/22/92

Title: Final Endangerment Assessment Addendum II, North Sea Landfill Site, Southampton, New York

Type: PLAN
Author: Naugle, Jill: CDM Federal Programs Corporation
Recipient: Kwan, Caroline: US EPA

Document Number: NOR-001-1092 To 1098 Date: 07/01/92

Title: Superfund Proposal Plan - North Sea Municipal Landfill Superfund Site, Town of Southampton, Suffolk County, New York

Type: PLAN
Author: none: US EPA
Recipient: none: none

Document Number: NOR-001-1099 To 1106 Date: 07/01/92

Title: North Sea Municipal Landfill Superfund Site, Town of Southampton, Suffolk County, New York - Superfund Proposed Plan

Type: PLAN
Author: none: US EPA
Recipient: none: none

Document Number: NOR-001-1107 To 1286 Date: / /

Title: (Inorganic, Volatile Organic and Semivolatile Organic Analyses Data Sheets for samples received in May and June, 1989)

Type: DATA
Author: none: H2M Group (Holzmacher McLendon & Murrell)
Recipient: none: US EPA

APPENDIX IV

Com McCABE #1019

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233-7010

Thomas C. Jorling
Commissioner

SEP 2 1992

Ms. Kathleen Callahan
Director
Emergency & Remedial Response Division
U.S. Environmental Protection Agency
Region II
26 Federal Plaza
New York, NY 10278

Re: North Sea Landfill ID No. 152052 Operable Unit 2
Record of Decision

Dear Ms. Callahan:

The New York State Department of Environmental Conservation (NYSDEC) has reviewed the referenced document and finds the no action alternative to be acceptable.

If you have any questions regarding this matter, please contact Michael J. O'Toole, Jr., at (518) 457-5861.

Sincerely,

Ann DeBarbieri
Deputy Commissioner

APPENDIX V

RESPONSIVENESS SUMMARY
FOR THE NO ACTION ALTERNATIVE OF THE SECOND OPERABLE UNIT AT THE NORTH SEA MUNICIPAL LANDFILL SUPERFUND SITE SOUTHAMPTON, SUFFOLK COUNTY, NEW YORK

SECTION

RESPONSIVENESS SUMMARY
FOR THE NO ACTION ALTERNATIVE OF THE SECOND OPERABLE UNIT AT THE NORTH SEA MUNICIPAL LANDFILL SUPERFUND SITE SOUTHAMPTON, SUFFOLK COUNTY, NEW YORK

SECTION

NORTH SEA MUNICIPAL LANDFILL SITE

RESPONSIVENESS SUMMARY FOR THE PROPOSED PLAN

The U.S. Environmental Protection Agency (EPA) held a public comment period from July 22, 1992 to August 21, 1992 to receive comments from interested parties on the Remedial Investigation (RI) report, Risk Assessment report and the Proposed Plan for the second operable unit (OU II) of the North Sea Municipal Landfill Superfund site (Site).

A public meeting was held by EPA on August 5, 1992 at the Southampton Town Hall, Southampton, New York to discuss the RI report and the no action preferred alternative for OU II.

This responsiveness summary provides a synopsis of citizens' comments and concerns about the Site as raised during the public comment period, as well as those written comments received by EPA during the public comment period, and EPA's responses to those comments. All comments summarized in this document were considered in EPA's final decision for selection of no action for OU II of the North Sea Municipal Landfill Site.

This community relations responsiveness summary is divided into the following sections:

I. OVERVIEW: This section briefly outlines the EPA's preferred no action decision for OU II.

II. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS: This section provides a brief history of community interest and concerns raised during the remedial planning for OU II at the Site.

III. COMPREHENSIVE SUMMARY OF MAJOR QUESTIONS, COMMENTS, CONCERNS AND RESPONSES: This section provides a summary of oral comments received by EPA at the public meeting for the site and those raised in written comments received from the local community. "Local community" may include local homeowners, businesses, and the municipality.

I. OVERVIEW

On July 22, 1992, EPA announced the public comment period and published its Proposed Plan for the OU II North Sea Municipal Landfill Site, located in Southampton, Suffolk County, New York. EPA screened possible alternatives to remediate ground water contamination, giving consideration to nine key evaluation criteria:

- Threshold criteria, including

  --Overall protection of human health and the environment
  --Compliance with Federal, State, and local environmental and health laws

- Balancing criteria, including
  --Long-term effectiveness
  --Short-term effectiveness
  --Reduction of mobility, toxicity, or volume
  --Implementability
  --Cost

- Modifying criteria, including
  --State acceptance, and
  --Community acceptance.

EPA carefully considered State and community acceptance of the remedy prior to reaching the final decision.

The Agency's preferred remedy is no action. This decision is based upon the review of all available data and the findings of the Remedial Investigation (RI) and the Risk Assessment. The Risk Assessment indicates that the levels of contaminants present in the ground water at the Site present risks that are acceptable. Therefore, a no action decision is protective of human health and the environment.

This plan satisfies the threshold criteria for remedy selection and obviates the need for long-term treatment and management.

II. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS

Community interest and concern about the Site has been steady throughout EPA's involvement.

EPA's community relations efforts for OU II included:

- Preparation of a community relations plan in July, 1991
- A public comment period from July 22, 1992 to August

21, 1992 on the Proposed Plan
- A public meeting on the Proposed Plan on August 5, 1992.

Those in attendance at the meeting included local area residents, State, County, and local officials, news media representatives, and representatives from EPA.

Public notification of the August 5, 1992 meeting was issued to local media, and to area residents and Federal, State, and local officials on EPA's Site mailing list. EPA announced the opening of the public comment period in a newspaper notice placed in the Suffolk County edition of Newsday on July 22, 1992, and the same notice was published in the Southampton Press and Hampton Chronicle on July 30, 1992.

In addition, EPA established Site information repositories at the Southampton College Library and the Southampton Village Library. The repositories contain the community relations plan, the RI, the Risk Assessment, the Proposed Plan, and other relevant documents. EPA's Administrative Record for the Site, which encompasses the key documents the Agency used in selecting the Site remedy, is housed at the above locations.

III. COMPREHENSIVE SUMMARY OF MAJOR QUESTIONS, COMMENTS, CONCERNS AND RESPONSES

This section provides a summary of oral comments received by EPA at the public meeting for the Site and those raised in written comments received from the local community. "Local community" may include local homeowners, businesses, the municipality, and not infrequently, potentially responsible parties (PRPs). The major issues and concerns regarding the Proposed Plan for the OU II at the Site, expressed at the public meeting on August 5, 1992, can be grouped into five categories:

1. **Health Concerns**
2. **Federal and State Jurisdiction**
3. **Ground water Testing**
4. **Air Emissions**
5. **Financial Ramifications**

A. SUMMARY OF QUESTIONS AND RESPONSES FROM THE PUBLIC MEETINGS CONCERNING THE NORTH SEA MUNICIPAL LANDFILL

1. Health Concerns

- A citizen asked what population EPA used for the cancer study.

EPA Response: EPA did not conduct a cancer study in terms of how many people had cancer. EPA conducted a risk assessment in which ground water concentrations were used to estimate the potential carcinogenic effects for chemicals found for various exposure pathways that were identified. This information can be found in the Risk Assessment.

- The same citizen asked if any retrospective studies have been conducted of the inhabitants and past inhabitants of the Fish Cove area.

New York State Department of Health (NYSDOH) Response: NYSDOH can conduct a cancer study in a specific area if requested by a citizen. To our knowledge, a cancer study has not been done in the Fish Cove area.

- A citizen asked about the condition of the clams that were collected.

EPA Response: In January of 1990 the Town's scientist/biologists conducted a benthic survey. They found 336 clams in a two-hour period. On August 5, 1992, more clams were collected and the NYSDOH will analyze them for metals to see if these clams are showing any signs of contamination. The results of this sampling will be available within the next two weeks.

- A citizen asked if there would be another meeting once the clam sampling results are in. How will we find out the results?

EPA Response: This was EPA's last scheduled meeting before remedy selection for OU II. The results will be referenced in the Record of Decision.

- Citizens continued to question what was being said about the sewage or septic system (i.e. bacteria). Citizens stated that there has been no new building in the Fish Cove area, in fact there is less since Fish Cove Inn closed.

NYSDOH Response: It is uncertain where the bacteria originates, although it does not appear to be from the landfill. Generally, bacteria are from septic systems, rather than landfills.

- Since the time of the public meeting, the results from the analysis of the clams have been received from NYSDOH (see Appendix II). The results indicate that the clam samples from Fish Cove contain levels of metals generally within the range of those collected from New York State waters.

- A citizen asked if any sampling was conducted outside the landfill area to see what the background levels are in soil?

  EPA Response: EPA conducted background soil sampling in June 1989 outside of the landfill area. Results indicated that surface soil and subsurface soil in and around Cell #1 are slightly higher than background soil for metals. However, they are within the regional ranges of metals found on Long Island.

2. Federal and State Jurisdiction

- A citizen asked if the EPA panel was talking about Cell #1 only.

  EPA Response: Yes, Cell #1 is EPA's jurisdiction and Cell #2 and Cell #3 are New York State Department of Environmental Conservation's (NYSDEC) jurisdiction. The National Priorities List (NPL) Superfund Site is only Cell #1.

- A citizen asked if there was a Cell #2 and Cell #3 when Cell #1 became a Superfund site.

  EPA Response: Cell #1 was proposed for inclusion on the NPL in 1984. Cell #2 was not active until 1985. When Cell #2 was capped pursuant to New York State regulations in 1990, Cell #3 became active.

- A citizen asked if there is any way EPA can become responsible for oversight of the entire landfill including Cells #2 and Cell #3.

  EPA Response: Both Cell #2 and Cell #3 would have to be listed on the NPL for EPA to assume oversight. Since Cells #2 and #3 are currently under the NYSDEC jurisdiction, this is highly unlikely. In addition, the current EPA Municipal Landfill policy states that municipal landfills are no longer being listed as NPL sites unless they pose a serious environmental threat that will not be addressed sufficiently through another authority. This is not the case for Cells #2 and #3.

- A citizen asked if EPA would be involved in the new composting project.

  EPA Response: No, EPA has no plans to become involved in the composting project. NYSDEC, rather than EPA, regulates this activity.

3. Ground water Testing

- A citizen asked the panel to clarify what no action for the second operable unit means.

  EPA Response: As stated in the Proposed Plan, EPA and NYSDEC are recommending no action for the remediation of ground water at the Site. However, Cell #1 will be capped pursuant to the first operable unit ROD. In addition, post-closure monitoring of air and ground water will be implemented.

- A citizen asked where the wells were tested in relation to the dump. Were they in the established plume area heading into Fish Cove?

  EPA Response: All of the RI monitoring wells (13) were installed hydrogeologically downgradient of Cell #1 and the former sludge lagoons within the established plume area. In addition, Ms. Kwan, EPA's project manager, conducted a door-to-door survey in 1990 to determine whether residents within the plume area were connected to private water wells or had public water. A map can be found in the repository that indicates where the survey was conducted. The survey included Great Hill Road and the Riegler III residence. The survey determined that twelve (12) residential wells are beyond the identified plume area which use private water. These residential wells were sampled and analyzed for the EPA Hazardous Substances List in September 1991. Results indicated that no contaminants were detected in these wells, above the federal and NYSDEC drinking water standards with the exception of iron and manganese which exceeded the NYSDEC drinking water standard slightly. This standard is a secondary maximum contaminant level established for aesthetics. It is not based on health effects.

- A citizen asked if residents could use their private wells again if they so choose.

  EPA Response: Articles 4 and 5 of the Suffolk County Sanitary Code do not permit residents to utilize private well water when public water is available.

- A citizen asked how EPA knows that the ground water contamination has not extended beyond the areas that were investigated.

  EPA Response: The numerous ground water studies that have been performed since 1979 have determined that ground water ultimately discharges to Fish Cove. During the RI, the surface water and sediment in Fish Cove were sampled. The

data indicated that there were no exceedances of Federal or State Water Quality standards except for iron, manganese and ammonia. Concentration levels of ammonia decrease with increasing distance from the southeast region of Fish Cove due to dispersion and dilution. Thus the ground water contamination does not have an adverse effect on Fish Cove.

4. Air Emissions

- A citizen asked if EPA was aware of the odor that has been present in the last six months. Has any air sampling been completed in the last six months to see if it is coming from Cell #1?

  EPA Response: EPA is aware of the odor complaints. The Town has completed air sampling for Cells 1, 2, and 3 and has reported to us that the odors are coming from Cells #2 and #3.

- The same citizen asked if the sampling is being taken between 4-5:00 a.m. when the smell is the worst, because by 9-10:00 a.m. the smell has dissipated and nobody knows where the smell came from. How can you be sure it is coming from Cells #2 and #3? Can we have a number to call when the smell is at its worst so that the readings can be taken at that point?

  EPA Response: EPA has requested the Town to monitor the air at various times. EPA has a toll-free number, 1-800-722-1223, to call if the regional NYSDEC office cannot be reached. In addition, Ms. Kwan, EPA's project manager can be contacted. Her phone number is listed in the Proposed Plan.

- A citizen stated that the smell has gotten worse since Cell #2 was capped and vented. Will it get even stronger when Cell #1 is vented?

  EPA Response: The decomposition of garbage in municipal landfills generates gases, which are emitted regardless of whether or not the landfills are capped. When a landfill is capped, venting systems are often installed in order to effectively capture the gas and vent it to the atmosphere so that the gas is not trapped under the cap. Cells #2 and #3 are relatively new landfills, therefore they contain "newer" garbage which is still decomposing. Cell #1 is older, and the rate of garbage decompostion, and thus the generation of gas, has decreased. Therefore, installing the cap on Cell #1 and venting the gas through a controlled system will not likely add to the existing odor problems.

- A citizen asked that if Cell #1 is partially capped on the top and it is sealed, and there is no break between Cell #1 and Cell #2, isn't it possible that the gases from Cell #1 are going to the highest points, therefore venting through the Cell #2 vents. Should you then monitor the Cell #2 vents also?

  EPA Response: It may be possible that the gases could migrate and be vented through the Cell #2 vents. Cell #2 vents are being monitored by NYSDEC. The Town has solicited bids for construction of a gas collection and flare system for gases released from Cell #2 vents. Currently, gas monitoring activities are undertaken on a bi-monthly basis for the wells at the perimeter of Cell #1 and results indicate an acceptable health concentration range. Hydrogen sulfide (H_2S) emissions were monitored by the Town personnel four times a week until June 1992. Based on the field results, the ambient air concentrations of H_2S at the fence line, off-site and most on-site locations are either non-detectable or are in the low parts per billion (ppb) range. While such levels are a nuisance, they are not deemed to be a health hazard. H_2S is detected by the human nose at the 1 to 10 ppb range which is well before it is considered a potential health hazard. The 8-hour exposure limit is 10 parts per million (ppm) while the short-term exposure limit (1-hour maximum duration) is 15 ppm. The H_2S level that triggers the immediate danger to life and health is 300 ppm. Methane gas monitoring is conducted on a bi-monthly basis at each of the 36 wells in the North Sea Landfill. Results indicate that some of the wells at the perimeter of the cells exceed 25% of the lower explosive limit (LEL). However, wells located further away from the perimeter, near the fence area and off-site did show methane levels to be below the 25% of the LEL. Following the capping of Cell #1 and the construction of the gas collection and flare system, should the gas monitoring results indicate levels of methane concentrations above 25% of the LEL, the Town has proposed to expand the active gas collection system to include Cell #1. Additional vents may also be added to tie into the gas collection and flare system.

- A citizen asked if the air was tested as thoroughly as the water.

  EPA Response: As stated in the OU II RI Summary Section of the Proposed Plan, baseline air emissions were calculated using soil gas vapor concentration data. The "worst case scenario" emissions were calculated using the highest concentration of contaminants detected. Comparison of the calculated downwind concentrations with each respective guideline concentration indicated that ambient

concentrations of all contaminants evaluated were within acceptable levels. The data are in the RI report, which can be found in the repositories listed in the Proposed Plan.

- A citizen asked whether it was possible that the venting could change the air emissions and whether EPA tested the air since the vents were put in.

  EPA Response: It is possible that venting could change the air emissions from location to location on the landfill cell from what the emissions were from the cell before venting. However, Cell #2 and Cell #3 are NYSDEC's jurisdiction. EPA has not and will not be testing these vents that were installed for Cell #2 and Cell #3.

- A citizen asked whether there will be follow up testing of the vents after Cell #1 is capped .

  EPA Response: Yes, under the NYSDEC Part 360 closure requirements (as outlined in the EPA's Record of Decision), the Town is required to conduct air and water quality monitoring of the landfill for 30 years.

5. Financial Ramifications

- A citizen asked, assuming the response action selected is no action, what financial ramifications will there be on the Town. Are they eligible for monies for the work that they have done?

  EPA Response: The Town has applied for New York State Environmental Quality Bond Act (EQBA) monies through NYSDEC for the first operable unit closure which could be reimbursed. The second operable unit is a no action remedy, so the Town will not have to apply for funding. The EQBA is a State law, rather than a Federal law. NYSDEC is currently reviewing their application.

- A citizen asked why in some cases the government pays for the clean up and other times the town has to pay.

  EPA Response: If the government pays for a cleanup at a site, reimbursement is sought from the responsible parties, which can include municipalities.

- A citizen asked if Superfund spent any money on the site, or has the Town paid for everything.

  EPA Response: Superfund has paid for the oversight of the OU I remedial design (RD) activities, as well as the OU II RI and Risk Assessment. In addition, EPA will be overseeing the construction of the OU I remedial action. All of these

monies are recoverable under the Superfund law.

- A citizen asked how much money has been spent from Superfund.

  EPA Response: EPA has spent $200,000 on previous work at the Site which included planning activities for the Site. So far, the Town has reimbursed the Superfund Trust Fund for $100,000. An additional $200,000 was spent by EPA for oversight of the OU I RI/FS and this was fully reimbursed to the Trust Fund. The Town has not yet been billed for oversight of OU I RD/RA or oversight of OU II RI.

5. SUMMARY OF WRITTEN COMMENTS AND EPA RESPONSES CONCERNING THE NORTH SEA MUNICIPAL LANDFILL

- A letter was received from the League of Women Voters stating that they concur with the no action plan.

- A letter was received from the Town of Southampton stating that they concur with the no action decision. Their specific comments (which have been paraphrased) are addressed as follows:

A. General Comments Relating to the Proposed Plan

1. EPA should clarify in their ROD that the Site subject to Superfund, which is EPA's jurisdiction, is only the former sludge lagoons and Cell #1. Cells #2 and #3 and the remaining acreage at the North Sea Landfill are not subject of either this ROD or the OU I ROD.

EPA Response: The Town is correct in that Cells #2 and #3 were not considered as sources at the Site when the Site was evaluated by EPA for the NPL and that they are regulated by NYSDEC pursuant to laws other than CERCLA. It is not accurate, however, to state generally that "the remaining acreage at the North Sea Landfill are not subject to" either of the RODs issued for the Site. For example, certainly those portions of the landfill which are downgradient of the former sludge lagoons and Cell #1 and where contamination exists from those sources are part of the Site. This understanding is clarified in the ROD.

2. EPA should clarify in the Proposed Plan that the Town connected all homes downgradient of the Landfill to be public water supply in 1981 because some of the private wells showed evidence of leachate contamination.

EPA Response: This statement was added to the ROD.

3. The Town wants to reserve its right to comment on the

results of the clam samples taken on August 5, 1992.

EPA Response: The results of the clam samples are attached in Appendix II. In addition, EPA forwarded these results to the Town on September 10, 1992. The Town may submit any comments it has to NYSDOH.

B. Specific Comments Relating to the Risk Assessment

4. While noncarcinogenic risk for both children and adults for individual compounds falls within EPA's acceptable target risk range, i.e., hazard index (HI) less than one, the Town contends that the hazard index value as presented in the Risk Assessment overstates the actual noncarcinogenic risk associated with Cell #1 and/or the former scavenger waste lagoons. The Risk Assessment identifies antimony as among the compounds contributing to noncarcinogenic "risk" to human health or the environment. However, review of the existing ground water data reveals that antimony was not even detected in the multitude of sample analyses presented in Attachment A of the Risk Assessment. Antimony data contained in Attachment A, from which its individual hazard quotients were calculated, are from samples: (1) for which analysis of antimony was not required (denoted by the letters "NA"); (2) from which antimony values were estimated because some quality control ("QC") criteria were not met (denoted by the letter "J"); (3) where antimony was analyzed for but not detected (denoted by the letter "U"); or (4) where antimony was found in the blank as well as in the sample (denoted by the letter "B"). The use of antimony in calculating risk associated with Cell #1 and/or the former scavenger waste lagoons, noncarcinogenic or otherwise, is inappropriate.

EPA Response: It must be understood that there is inherent uncertainty in all analytical measurements. These uncertainties can and are minimized where possible although they cannot be eliminated entirely. As stated in the comment, measuring accuracies were within limits prescribed by USEPA's contract laboratory program. Utilizing USEPA's conservative approach toward risk assessment, data were evaluated as they were reported in developing the Risk Assessment.

In Attachment A of the Risk Assessment report, "NA" refers to "not analyzed for" as explained in the notes at the end of the Appendix; therefore, no results are available or were considered for risk assessment purposes.

Data in Attachment A qualified with "U" were utilized in the

Risk Assessment in accordance with USEPA's Risk Assessment Guidance for Superfund: Human Health Evaluation Manual (1989). RAGS (1989) specifies the use of one-half the detection limit for non-detect samples as a proxy concentration to prevent underestimation of potential health threats.

The qualifier, "J" indicates that the compound was found, but the concentration could not be exactly quantified due to quality assurance/quality control problems. According to RAGS (1989), these data can be used just as positive data with no qualifiers or codes. With proper interpretation, these data are used in risk assessment calculations (i.e. frequency of detection, etc.).

It is important to note that in the risk assessment process, the reduction of chemicals of potential concern is optional and should be considered only when a large number of chemicals would be carried through the quantitative risk assessment evaluation, resulting in a report which would be difficult to understand and perhaps distract from the dominant risks. Other criteria such as toxicity, history of the site/site-relatedness, mobility, etc. must also be considered when selecting or eliminating chemicals of potential concern. In addition, the level at which the frequency of detection (i.e. 5 percent) is set, is determined on a site-by-site basis. Therefore, based on the above screening criteria, there was no justification to eliminate the contaminants referenced in the above comment from the risk assessment.

In conclusion, USEPA's RAGS (1989) states that data qualified with "J" are valid data, usable in the quantitative risk assessment. Based on this, the frequency of detection for antimony exceeds the 5 percent level set for this site. It is important to realize that the toxicity of antimony is quite high (oral reference dose = 4.00E-04 mg/kg-day) and careful evaluation is necessary in considering its elimination. USEPA recommends a conservative although realistic approach to performing baseline public health risk assessments.

5. Similarly, arsenic is identified as a primary compound driving EPA's evaluation of noncarcinogenic hazards related to Cell #1 and/or the former scavenger waste lagoons. As discussed in connection with antimony and other noncarcinogenic compounds, data appear to have been incorporated into computing risk despite evidence that such data are not representative of actual site conditions.

EPA Response: Upon review of the arsenic data in Attachment

A, over 40 percent of the H2M data was observed to have reported detection limits of 3.0U or 2.5U. One-half of these detection limits is not significantly higher than one-half of Versar's, EPA oversight contractor, reported detection limits of 1.3U or 1.4U. As stated in the previous comment (4), inherent uncertainty exists in all analytical measurements. All valid data were retained and incorporated into the Risk Assessment for conservatism. It must also be realized that the concentration term is one input value out of numerous others used in the calculation of risk or hazard index values and that arsenic is both a carcinogen and a noncarcinogen.

One should be aware that in the calculation of these risks and hazard index values, daily intake (chronic and subchronic as applicable) are first calculated (as presented in the Risk Assessment). The daily intake input parameters (i.e. exposure frequency, exposure duration; ingestion rate, skin surface area, etc) are conservative assumptions based on EPA guidance documents and site information which are used in combination with the calculated chemical concentrations. The resulting daily intakes are then combined with their respective toxicity factors, resulting in risk or hazard quotient values.

6. The Risk Assessment states that the metals antimony, arsenic and cadmium contribute "approximately 75 percent to the hazard from ground water ingestion by children" and that the hazards would not be additive because each metal affects different target organs. The hazard indices calculated for both adults and children are based on the addition of the hazard quotients of these metals and other identified compounds. These hazard indices would therefore represent an overestimation of the actual noncarcinogenic risk posed by Cell #1 and/or the former scavenger waste lagoons.

EPA Response: As per RAGS (1989), to assess the overall potential for noncarcinogenic effects posed by more than one chemical, a hazard index is calculated. The hazard index is the sum of the individual hazard quotients and is a standard calculation performed in risk assessments. This approach assumes that simultaneous subthreshold exposures to several chemicals could result in an adverse health effect. It also assumes that the magnitude of the adverse effect will be proportional to the sum of the ratios of the subthreshold exposures to acceptable exposures. However, the hazard index has been qualified on page 65 of the risk assessment to explain that these metals affect different organs, therefore, the hazards would not be additive. In addition, the hazard quotients for these metals are below the threshold level of one and would not be expected to result

in deleterious effects.

7. Several wells upgradient of the landfill were used from which a number of sampling events were conducted. Since data generated from these wells are believed to represent ambient or background conditions, inclusion of such data into Risk Assessment calculations appears to introduce a technical bias. The upgradient well data should be used for comparison purposes and should be subtracted from the concentrations detected in downgradient wells, thereby yielding compound concentrations which could be used to more accurately calculate the potential threat posed by Cell #1 and/or the former scavenger waste lagoons.

EPA Response: Average concentrations were calculated using sample data from on-site background well data and monitoring well MW-1 data since it is believed that there has been some site influence on the ground water at these locations. Upgradient residential wells were not included in any calculations nor were data from monitoring well MW-2. (This well was believed to be deteriorating.)

The only upgradient well data utilized in the risk assessment calculations, as stated in the above response, were those that were believed to be influenced by the Site. These ground water samples would therefore not be representative of ambient (natural) upgradient conditions. Receptors may be exposed to chemical concentrations in ground water downgradient of the site; this is independent of the upgradient ground water concentrations. One may qualify the calculated risk or hazard index results, but the "actual" concentration to which receptors may be exposed is used in calculations as standard risk assessment procedure.

- A letter was received from the Southampton Town Tax Pac, Inc. stating that they concur with the no action alternative. This conclusion was supported by findings which require no response. However, comment numbers 6 and 7 and the Section labeled Chromium and Nickel Artifacts are addressed as follows:

6. The Issue of Soil Contaminated Sample Southampton Town Tax Pac objects to the inclusion of unfiltered samples in the RI data base as they believe monitoring wells were poorly developed. They also question the need for upgrading the cap if the contaminant concentrations decreased.

EPA Response: The redevelopment of monitoring wells prior to the OU II RI sampling clearly resulted in a reduction in lead, cadmium and iron concentrations in unfiltered ground water samples. It should be noted that these reductions in

concentrations were not consistently by an order of magnitude as stated in the comment. However, an upgraded cap is still necessary per the OU I ROD.

As leachate migrates from the landfill and mixes with ground water in the underlying aquifer, there is a sediment-water interaction. Metal cations, such as those indicated above, react with and adsorb to the aquifer matrix. Overall, the net effect of this geochemical process is to attenuate metal concentrations as a leachate plume moves away from its source, in this case, the landfill.

The aquifer matrix has a finite capacity for the total amount of lead, cadmium, and iron which can be temporarily fixed (adsorbed) to the soil particles in the aquifer. Theoretically, an unabated source of metal contamination could continue to react with the aquifer matrix at progressively greater distances from the source, given sufficient time.

Private well supplies located downgradient from the landfill, or contiguous to its associated contaminant plume are probably not filtered prior to potable use. It is moot under those circumstances whether or not lead, cadmium or iron occurs as suspended matter, or is in dissolved form; in either instance, the water is still consumed. To be conservative in allowing for an adequate safety factor, MCLs are applied to concentrations in water.

7. The Final Risk Assessment Addendum II The content of this comment is similar to the Town of Southampton's comment # 4 on page 11 of this Responsiveness Summary.

EPA Response: Refer to EPA's Response to the Town of Southampton's comment #4 on page 12 of this Responsiveness Summary.

Chromium and Nickel Artifacts Given that the ground water is acidic, and that chlorides and hydrochloric acid (HCl) are present in the North Sea landfill environment, stainless steel 304 should not be the material of construction for monitoring wells as it corrodes, giving false values for chromium and nickel. Therefore, chromium and nickel should not be taken into account when calculating the hazard index values.

EPA Response: There is no well construction material which is totally inert. For this reason, well construction protocols are designed in the best possible manner to meet requisite data quality objectives. In the case of landfill

ground water monitoring, where a wide variety of contaminant types are anticipated, there is no single, ideal well casing. In general, polyvinyl chloride (PVC) and stainless steel (SS) well construction material are employed for monitoring metals and VOCs, respectively. To insist that a monitoring well couplet, one well of SS and a second of PVC, be installed at every monitoring location is cost prohibitive. Thus, some judgement must be exercised in the selection of well construction materials.

It is possible that highly acidic ground water does react with SS 304, although it is not evident that the ground water is highly acidic. The "ambient" acidic ground water environment is, at least, partially attributed to the acidification of ground water near the landfill by leachate originating from it. That leachate enriched water is corrosive is not surprising; in fact, it is part of the reason for monitoring water quality in the vicinity of a landfill in the first place.

The fact that none of the private wells show any "significant" presence of chromium may or may not be meaningful. These wells may be located at a distance downgradient of the landfill which is not affected by low pH concentration. Alternatively, they may simply be located cross-gradient of the leachate contaminant plume. In any case, to subtract the concentrations of nickel and chromium from the hazard index would not serve the intended function of a risk assessment, whose objective is to afford protection for human health and the environment.

In addition, as stated in EPA's Response to the Town's comment #7 on page 15 of this Responsiveness Summary, monitoring well MW-2 data (this well was believed to be deteriorating because of the nearby road salt pile) was not used in any risk assessment calculation.

- A letter was received from the Southampton Cove Owners' Association stating that they oppose EPA's recommendation for "no further action" at Cell #1. The letter proposes that 1.3 million cubic yards of waste be removed and disposed of in a less environmentally sensitive area. In addition, the letter proposes that the landfill operation be prevented from accepting any more raw garbage to avoid further contamination of the waters of Fish Cove. Their specific comments are addressed as follows:

  1. "The cap and drainage system installed will only reduce infiltration of rain and surface water into the cell. Consequently, leachate will continue to flow into Fish Cove through the existing plume compounding and

increasing the levels of vinyl chloride, lead, cadmium and manganese in the soils and waters of Fish Cove."

EPA RESPONSE: Although the statement is true, EPA does not believe that leachate generation is or will be a problem for the following reasons: 1) vinyl chloride was detected only once in an on-site monitoring well throughout all the sampling events. Vinyl chloride was not detected in sediments or surface water in Fish Cove.

2) Lead was detected above the EPA's cleanup level policy for lead in ground water at Superfund sites (15 ppb) in two upgradient and two on-site monitoring wells during the OU I sampling events. During the OU II sampling events, lead was detected above 15 ppb in the two newly installed monitoring wells (12A and 12B) and in an upgradient well. Monitoring wells 12A and 12B are located immediately adjacent to the landfill. Lead was detected in background sediment and was not detected in surface water samples in Fish Cove.

3) Cadmium was detected over the NYSDEC drinking water standard (10 ppb) in 4 monitoring wells during the OU I sampling events, but not detected in the OU II sampling events. Cadmium was not detected above the surface water standard.

4) Manganese was detected in all of the monitoring wells located on and downgradient of the landfill as well as in sediments and surface water in Fish Cove. Iron and manganese are naturally occurring in the soils on Long Island. As a result of anoxic conditions created by the decay of organic matter, both of these metals are released into solution, resulting in increased concentrations in the sediments, sediment-water interface and pore waters of Fish Cove.

2. "Fish Cove is a residential neighborhood that has and will continue to have a large population of children who play in, boat, water ski and consequently drink the waters of Fish Cove. We have reviewed the Risk Assessment and feel that the assessment underestimates the level of hazard caused by the flow of heavy metals into Fish Cove."

EPA Response: Ground water data was used in the Soil Contamination Evaluation Methodology (SOCEM) model to characterize the impact that contaminated ground water below the North Sea Landfill may have on Fish Cove. This model is considered to be conservative in its estimation of downgradient concentrations. Assumptions used in this model (see the Risk Assessment) are considered to be quite a conservative estimation of potential downgradient

contaminant concentrations. The numbers generated from this model that were input for the risk calculations can be viewed essentially as a "worst case" scenario since they do not allow for the mechanism of contaminant loss (e.g., degradation, sorption). The model also does not allow for the full dilution effects expected from precipitation recharge or longitudinal dispersion. Exposure levels computed from these numbers will therefore be biased high.

Results in the Risk Assessment indicated that all carcinogenic and noncarcinogenic risks for all exposure pathways , including recreation in Fish Cove, are within the EPA's acceptable risk ranges.

3. "The study of hard clams from the southeast region of Fish Cove is incomplete. Further investigation of the degree of contamination by heavy metals is recommended."

EPA RESPONSE: On August 5, 1992, NYSDOH collected clam samples and analyzed them for priority pollutant metals. The results from the analysis of the clams have been received from NYSDOH (see Appendix II). The results indicate that the clam samples from Fish Cove contain levels of metals generally within the range of those collected from New York State waters.